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ORIGINAL ARTICLE

Analysis of Türkiye's Export Performance in the European Hazelnut Market: An Application of the Constant Market Share Method

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Abstract
This study aimed to quantitatively assess Türkiye's export performance in the EU28 hazelnut market (kernel basis) from 2010 to 2021 by applying the constant market share (CMS) method to identify and measure the key factors influencing competitiveness over time. Türkiye's market share in the European hazelnut market increased and the commodity composition effect made the largest contribution, showing that hazelnut is the right export product for the target market. However, some components, namely, the market share effect for 2010–2013 vs. 2014–2017, the commodity adaptation effect for 2010–2013 vs. 2018–2021, and the market composition effect for 2014–2017 vs. 2018–2021, had the largest negative impact on market share, indicating performance areas where Türkiye was not successful. Türkiye needs to undertake a comprehensive review of its competitive strategies, with particular emphasis on product quality, to facilitate further growth of its hazelnut exports within the European market.

Keywords Constant market share · European hazelnut market · Export performance · Competitiveness · Türkiye

Introduction

The hazelnut plant is a tree native to Europe and Asia. This plant naturally grows in temperate climates such as Türkiye, Spain, and Italy (Bottone et al. 2019). Besides consumption demand for health-related reasons (Ros 2010), hazelnut is an important input for the food industry globally (Ghirardello et al. 2013) and, moreover, the shell of hazelnuts can be used as fuel (Solis et al. 2023). For these reasons, the demand for hazelnut has grown, making the hazelnut trade important.

Hazelnut is one of the strategic products of Türkiye due to its significant production and export values and its superior quality. Hazelnut has a high commercial value, and Türkiye is the world leader in production. Türkiye exports hazelnut kernel (56.7%), processed hazelnut (16.8%), and advanced processed hazelnut (26.5%; RTMCT 2022). World hazelnut production fluctuated between 357,000 and 510,000 t (kernel basis) over the past 5 years. Türkiye, the main producer, with 304,000 t per year on average, accounts for 70% of the world hazelnut production. Italy, Azerbaijan, and Georgia follow as main hazelnut-producing countries (INC 2019). Hazelnut kernels constitute 86.33% of global hazelnut imports, which is 321,413 t. The top six importing countries are Germany, Italy, France, the Netherlands, Poland, and Spain, and they account for 87.25% of EU28's import, i.e., 172.465 tons (ITC 2021).

Constant market share (CMS) analysis has been widely employed in the literature to evaluate export performance and competitiveness across various agricultural sub-sectors. In fisheries, for example, Klasra and Fidan (2005) and Soh et al. (2021) used CMS to reveal that while Malaysia maintained competitiveness in frozen fish, it faced challenges in

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crustacean exports. In the fruit and vegetable sector, Nilsson et al. (2007) found that Mediterranean countries had varying levels of competitiveness, while Capobianco-Uriarte et al. (2017) identified Spain's structural advantage in the European tomato market. In the wheat sector, Ahmadi-Esfahami (1995) showed that Japan's import quotas limited market access despite global demand. Chen and Duan (2001) applied CMS to Canadian agrifood exports and emphasized the need to diversify export destinations. More recently, Zdráhal et al. (2023) used CMS to analyze the Czech Republic's agrifood trade and concluded that limited product and market diversification hindered the full realization of export potential. Similarly, Varalakshmi and Devatkal (2017) reported that India's competitiveness in bovine meat exports varied significantly across different destinations. These studies demonstrate that CMS is a powerful tool for decomposing trade performance and guiding policy, especially when export gains or losses result from structural or competitiveness-related shifts rather than external demand alone. Majdalawi et al. (2020) applied CMS to date palm exports and observed that year-to-year swings in export growth were largely due to shifts in production and changes in import policies in destination markets. This highlights the utility of CMS in identifying structural market shifts (e.g., policy or supply fluctuations) that affect export outcomes. Fu et al. (2021) analyzed fruit exports from Hainan, China, and showed that higher labor costs decreased price competitiveness. This underscores how CMS can isolate a competitiveness effect impacting export performance. Cano-Espinosa and Mendez-Leon (2025) evaluated the competitive performance of Mexican fresh grape exports in the United States market from 2002 to 2022. Notably, it was pointed out that Peru's success was linked to product adaptation, dynamic production strategies, and alignment with evolving market demand, which CMS helped identify as a critical factor for sustained export growth. The aforementioned studies collectively illustrate the suitability of CMS in agricultural trade research, especially when the objective is to dissect export growth into meaningful components over time. To date, there are no CMS analyses for hazelnut in the literature.

While several previous studies have analyzed Türkiye's hazelnut exports using various trade performance indicators, this study makes a distinctive contribution by applying the CMS method, which is a technique that has not been previously employed in the context of Türkiye's hazelnut exports. Prior research has predominantly focused on descriptive trade statistics, price competitiveness, or comparative advantage indices (Güney 2014; Erol et al. 2023; Yıldırım et al. 2024). Moreover, while Kara (2024) employed artificial neural networks to predict the price of hazelnuts, Çukur and Çukur (2023) utilized the Koyck model to determine whether a correlation exists between hazelnut production and hazelnut prices. These studies provide aggregate-level insights but lack capacity to decompose export performance into detailed structural and competitive dimensions. In contrast to these approaches, the CMS method enables a component-based analysis, identifying whether changes in Türkiye's market share are attributable to overall demand shifts, product composition, market orientation, or genuine competitiveness. This study is the first to implement CMS analysis for Türkiye's hazelnut exports to the European Union.

The aim of CMS analysis is to determine whether there have been structural changes in foreign trade. This method assesses whether changes in a country's export performance are structural and allows for commentary on overall foreign trade. Employing this export performance-weighted approach is justified as there has been no notable shift in import composition during the specified time frame. Since Europe has the largest hazelnut market in the world and Türkiye is by far the largest exporter in this market, we aimed to examine the export performance of Türkiye during the period 2010–2021 in the European hazelnut market. For this, CMS analysis with five components was applied for the EU28 hazelnut (kernel basis) market. This study sought to answer the following research question: How has Türkiye's hazelnut export performance in the EU market changed over time, and what structural factors have driven this change? The novelty of the study lies in the application of the CMS model to the hazelnut sector. The findings are expected to support policymakers by identifying structural strengths and bottlenecks in Türkiye's hazelnut export strategy and by offering insights for improving market alignment and competitiveness in the EU market.

Materials and Methods

Türkiye's hazelnut (kernel basis) export performance in the European market between 2010 and 2021 was examined using CMS analysis. The CMS methodology is predicated on the assumption that a country's market share should remain constant when the level of competitiveness remains unchanged. Consequently, any discrepancy between a country's export growth and the aggregate export growth of its competitors within the market can be attributed to either a shift in the composition of that country's exports or an alteration in its export competitiveness (Zdráhal et al. 2023). It is a statistical method employed to evaluate the influence of structural factors on export growth and participation in import markets. The fundamental premise of this methodology is to illustrate the variability in a country's export market share over a defined period, with the assumption that the reference country maintains its proportional share of all markets for all goods (Capobianco-Uriarte et al. 2017).

We selected CMS analysis for this study due to its ability to decompose changes in export performance into distinct structural and competitive components over time. While alternative approaches such as the revealed comparative advantage (RCA) index are widely used in trade competitiveness studies, CMS offers a more detailed analytical framework. Specifically, CMS separates total export change into five components. This decomposition allows for a more nuanced understanding of how product and market structures, as well as competitiveness, affect export dynamics over different periods. By contrast, RCA provides a relative measure of a country's competitive position in a product group but does not account for temporal structural changes or differences between specific target markets. It has also been widely applied in the agricultural trade literature (Nilsson et al. 2007; Capobianco-Uriarte et al. 2017; Zdráhal et al. 2023) where export structure and market composition are critical dimensions of competitiveness.

The traditional CMS model was first introduced by Tyszynski (1951) and Richardson (1971). Tyszynski sought to ascertain the extent to which alterations in the global market shares of disparate countries can be attributed to the composition of the products initially exported by each country. In the traditional CMS methodology, a country's export growth may align or not with the global average due to three factors: (a) the demand for exported commodities may be growing quickly or slowly, (b) exports may be directed to fast-growing or stagnant regions, and (c) the country may be more effective or less effective in competing with other suppliers. Subsequently, Ahmadi-Esfahami (1995) adapted Jepma's (1989) approach and applied the analysis to a specific context: exporters of agricultural products in particular markets. The CMS analysis method was also modified by Fagerberg and Solie (1987) and used by Erlat and Erlat (2012). A CMS analysis represents a crucial instrument for elucidating the manner in which a country's competitive position and market share evolve over time in a range of sectors, particularly in the context of hazelnut exports. By using CMS analysis, over the 12-year period between 2010 and 2021, we aimed to understand how Türkiye's hazelnut export performance has changed structurally.

For the analysis, production and trade statistics of hazelnut were obtained from The Food and Agriculture Organization (FAO) and International Trade Centre (ITC) database. Italy, Germany, France, Poland, the Netherlands,

$S_{ij} = \frac{X_{ij}}{\sum_{i=1}^{N} Mij} = a_{ij}b_{ij}$	$\boldsymbol{X_{ij}}$: Country $\boldsymbol{a}$'s export of commodity $\boldsymbol{i}$ to country $\boldsymbol{j}$
$a_{ij} = {X_{ij}}/{M_{ij}}$	$\boldsymbol{M_{ij}}$: Country $\boldsymbol{j}$'s import of commodity $\boldsymbol{i}$
$b_{ij} = {M_{ij}}/{\sum_{i=1}^{N} Mij}$	$\boldsymbol{S_{ij}}$: Market share of country $\boldsymbol{a}$'s export of commodity $\boldsymbol{i}$ in country $\boldsymbol{j}$'s imports
$\Delta S_{ij} = S_{ij}^{1} - S_{IJ}^{0} = a_{ij}^{1}b_{ij}^{1} - a_{ij}^{0}b_{ij}^{0}$	$\boldsymbol{a_{ij}}$: Commodity share of country $\boldsymbol{a}$'s export of commodity $\boldsymbol{i}$ in country $\boldsymbol{j}$'s import of $\boldsymbol{i}$
$\Delta S_{ij} = (a_{ij}^{1} - a_{IJ}^{0})b_{ij}^{0} + (b_{ij}^{1} - b_{ij}^{0})a_{ij}^{0} + (a_{ij}^{1} - a_{ij}^{0})(b_{ij}^{1} - b_{ij}^{0})$	$\boldsymbol{b_{ij}}$: Commodity share of $\boldsymbol{i}$ in country $\boldsymbol{j}$'s import
$\Delta S_{ij} = (a_{ij}^{1} - a_{IJ}^{0})b_{ij}^{0} + (b_{ij}^{1} - b_{ij}^{0})a_{ij}^{0} + (a_{ij}^{1} - a_{ij}^{0})(b_{ij}^{1} - b_{ij}^{0})$	**0** and **1**: The change between time
$MSE = (a_{ij}^{1} - a_{ij}^{0})b_{ij}^{0}$	***MSE:*** The effect of changes in micro shares of country $\boldsymbol{a}$ commodity.
$CE = (b_{ij}^{1} - b_{ij}^{0})a_{ij}^{0}$	***CE:*** It indicates whether country $\boldsymbol{a}$ has concentrated on the export of rapidly growing commodities.
$CAE = (a_{ij}^{1} - a_{ij}^{0})(b_{ij}^{1} - b_{ij}^{0})$	***CAE:*** Adaptability of country $\boldsymbol{a}$ to the changes in commodity composition.
$S_{ij} = {\sum_{j=1}^{m} X_{ij}}/{\sum_{i=1}^{N}\sum_{j=1}^{m} M_{ij}} = \sum_{j=1}^{m}(a_{ij}b_{ij})c_j = \sum_{j=1}^{m} s_{ij}c_j$	The share of country a's exports of item $\boldsymbol{i}$ to this target group in the group's total imports.
$c_j = {\sum_{j=1}^{m} X_{ij}}/{\sum_{i=1}^{N}\sum_{j=1}^{m} M_{ij}}$	$\boldsymbol{m}$: The number of countries in the target group.
$MCE = \sum_{j=1}^{m}(c_{ij}^{1} - c_{ij}^{0})S_{ij}^{0})$	$\boldsymbol{c_j}$: Share of the country j's total imports in the group market's total imports.
$AMCE = \sum_{j=1}^{m}(c_{ij}^{1} - c_{ij}^{0})(S_{ij}^{1} - S_{ij}^{0})$	***MCE:*** Change in market shares of selected countries within the group. MCE is one of the ΔS_{ij}'s component, which was developed for group market
$\Delta S_{ij} = \sum_{j=1}^{m}(a_{ij}^{1} - a_{ij}^{0})b_{ij}^{0}c_{ij}^{0} + \sum_{j=1}^{m}(b_{ij}^{1} - b_{ij}^{0})a_{ij}^{0}c_{ij}^{0} + \sum_{j=1}^{m}(a_{ij}^{1} - a_{ij}^{0})(b_{ij}^{1} - b_{ij}^{0})c_{ij}^{0} + \sum_{j=1}^{m}(c_{ij}^{1} - c_{ij}^{0})S_{ij}^{0} + \sum_{j=1}^{m}(c_{ij}^{1} - c_{ij}^{0})(S_{ij}^{1} - S_{ij}^{0})$	***AMCE*:** Adaptability of country $\boldsymbol{a}$'s market shares for item $\boldsymbol{i}$ to the change in market shares
	$\boldsymbol{\Delta S_{ij}}$: Difference of the two selected periods, divided into five components.

Fig. 1 Formulations and explanation of constant market share (CMS)

and Spain, which comprise 87.25% of European hazelnut (kernel basis) imports, were selected to represent the European hazelnut market. Other European countries were not included in the CMS analysis, as they have a share of less than 1% in Türkiye's hazelnut exports to Europe. We chose to undertake the study in terms of export volumes in tons to avoid the use of economic deflators.

The CMS analysis in this study encompasses the period from 2010 to 2021, which is divided into three subperiods: period I (2010–2013), period II (2014–2017), and period III (2018–2021). The data for each period is represented as the average of 4 years. The analysis consists of three time parts: first, the analysis of periods I vs. II; then the analysis of periods I vs. III; and, finally, the analysis of periods II vs. III. Five components are used in CMS analysis to explain market share, i.e., market share effect (MSE), commodity composition effect (CCE/CE), commodity adaptation effect (CAE), market composition effect (MCE), and adaptation to market composition effect (AMCE). The formulations and explanation of the CMS parameters are shown in Fig. 1.

Results

Hazelnut Import Profile of Selected European Countries

Türkiye's global hazelnut exports amount to 201,531 t, and the European hazelnut market constitutes 73.71% of Türkiye's total hazelnut exports. The six European countries selected in this study account for 93.44% of hazelnut exports from Türkiye to Europe, as well as 68.88% of Türkiye's hazelnut exports to the world (Table 1). Furthermore, these countries are significant producers of chocolate worldwide, which results in a high demand for hazelnuts.

Türkiye's Hazelnut Export Performance in European Hazelnut Market

The results of the CMS analysis for the European market, which is an aggregation of the selected countries, are given in Table 2. These six European countries, which comprise the majority of the European hazelnut market, are considered a single market representing this market. In this way, all five components were calculated. According to the results of the CMS analysis of the comparison between periods, the market share of Türkiye's exports to European countries increased, and the biggest contribution to this increase is the CCE.

Period I (2010–2013) Versus Period II (2014–2017)

The results of the first analysis showed that the market share of Türkiye's hazelnut export increased between period I and period II. Considering period I and period II, the biggest contribution to market share belongs to CCE, while AMCE had a small positive impact. In order of impact size, MSE, CAE, and MCE had a negative impact. The MSE demonstrated a negative impact, with a value of –45.24 (Table 2). This suggests that Türkiye is experiencing a decline in market share with regard to the exportation of hazelnuts. The

Table 1 Importing markets for hazelnut (kernel basis) exported by Türkiye, 2021 (source: data from the International Trade Centre (2021) database)

Importer		Quantity (t)	Importing rate in European market (%)	Importing rate in the world (%)
World market total		201,531	–	100.00
European market total		148,556	100.00	73.71
Six main importers in European market	Italy	68,202	45.91	33.84
	Germany	36,689	24.70	18.21
	France	15,899	10.70	7.89
	Poland	10,482	7.06	5.20
	Netherlands	4,284	2.88	2.13
	Spain	3,255	2.19	1.62
	Total	138,811	93.44	68.88

Table 2 Result of CMS analysis for European hazelnut market in different periods (%) (source: data from the International Trade Centre (2021) database)

Periods[1]	MSE	CCE	CAE	MCE	AMCE	Total
I vs. II	*–45.24*	85.18	*–20.93*	*–6.99*	14.45	26.47
I vs. III	*–19.35*	341.89	*–81.95*	*–27.45*	59.25	272.38
II vs. III	22.34	236.19	*–6.00*	*–11.31*	15.35	256.57

AMCE adaptation to market composition effect, *CAE* commodity adaptation effect, *CCE* commodity composition effect, *CMS* constant market share, *MCE* market composition effect, *MSE* market share effect
Numbers in italic mean loss of percent changes
[1]Period I, 2010–2013; period II, 2014–2017; period III, 2018–2021

observed reduction can be attributed to fluctuations in yield, which is due to periodicity. In 2014, the damage caused by the agricultural frost event in hazelnut orchards was also significant. While MSE is interpreted in light of contextual factors such as yield fluctuations and rising production costs, these attributions are based on sectoral observations and are not empirically tested within the CMS framework. Future research may incorporate econometric models using production and cost data to strengthen causal inference.

The CCE with a positive value of 85.18 indicates that Türkiye's exported hazelnut types conform to the types favored in the European market and that Türkiye is able to adapt its product structures to meet the demands of the European market. This high CCE shows that Türkiye's hazelnut export composition is well adapted to the demands of the European market. However, the CAE, with a value of –20.93, indicates that Türkiye is not adapting effectively enough to changes in demand in the European hazelnut market. This indicates that Türkiye needs to make investments on renewing more hazelnut gardens and quality standards.

The MCE had a negative impact of –6.99. This can be interpreted as a contraction of some of Türkiye's target markets in Europe because of the intensification of competition in these markets. The result indicates that Türkiye should pursue greater market diversification. The AMCE is a positive indicator, with a value of 14.45, suggesting that Türkiye's export structure has the capacity to adapt to the evolving market composition of Europe. This is an encouraging sign that Türkiye has a proactive export strategy and is responsive to shifts in the European market. The combined effect of these factors, as identified by the CMS analysis, resulted in a net increase of 26.47% in the comparison between the 2010–2013 (period I) and 2014–2017 (period II) periods. This positive total change value indicates an overall improvement in Türkiye's export performance in the European hazelnut market, despite the negative effects of the other factors.

Period I (2010–2013) Versus Period III (2018–2021)

In the second analysis, period I and period III were compared. According to the results, the market share effect (MSE) value of –19.35 indicates a decline in Türkiye's market share in hazelnut exports compared to the analysis periods. This decline is due to changes in production costs. On the other hand, the CCE score of 341.89 provides compelling evidence of the compatibility of the hazelnut varieties exported by Türkiye with the product structure preferences of the European market and the efficacy of targeting customer segments with demand for these products. The MCE indicates the extent to which exports from a given country to specific market segments within the European market are either declining in relative terms or failing to keep pace with the overall growth of these segments. In the case of Türkiye, the MCE value of –27.45 suggests that the country's exports to European market segments, particularly those that are experiencing growth or exhibiting high profitability, have either decreased in relative terms or have lagged behind the overall growth of these segments. The positive value of the AMCE shows that Türkiye is demonstrating an encouraging capacity to align its market position with the evolving diversity and scope of the European hazelnut market, and to align itself with the broader structural dynamics of the market. The aggregate of these elements, amounting to 272.38, signifies a considerable overall positive growth in the performance of Turkish hazelnut exports during this period.

Period II (2014–2017) Versus Period III (2018–2021)

The MSE was calculated as 22.34, indicating that Türkiye has achieved a moderate increase in its market share in the European hazelnut market. This increase can be attributed to the maintenance of Türkiye's competitive advantages in hazelnut exports. The positive effect of the CCE confirms the strong demand for these products in the European market and the country's robust market position once again. The negative effect of the CAE and MCE reveals that Türkiye was unable to implement the requisite strategies in a timely manner, thereby failing to align its actions with the evolving demands of the European market. Consequently, it was unable to attain the anticipated growth in the European hazelnut market or secure the desired market share. But the positive effect of the AMCE shows that Türkiye has the potential to adapt to the structural characteristics of the European hazelnut market. The high total value of 256.57 proves that Türkiye recorded an overall growth and improvement in the European hazelnut market in period III (2018–2021) compared to period II (2014–2017).

General Assessment

A general evaluation of the aforementioned results is presented here. The CMS analysis demonstrates Türkiye's capacity to adapt to significant market dynamics and conditions in the European hazelnut market between 2010 and 2021. The analysis reveals that Türkiye has effectively responded to product demands in the European market, with particularly high positive values in the CCE category. This indicates that Türkiye's product portfolio is of the quality and diversity demanded by Europe and has established a robust market position. On the other hand, the negative values of the MSE in certain periods raise concerns about the sustainability of Türkiye's competitive advantages. This supports the findings of Yıldırım et al. (2024), who analyzed Turkey's competitiveness in the world hazelnut market us-

ing the RCA theorem and found a declining trend. They emphasized that to sustain competitiveness, Türkiye must increase yield and quality, focus on high-value-added exports, and diversify markets.

The positive effect of the CCE indicates that the hazelnut varieties exported by Türkiye are in demand in the European market. This implies that appropriate varieties are selected during the production planning stage and that these varieties are produced to a high-quality standard. Although Türkiye is a significant producer of hazelnuts and is renowned for the quality of its produce, the popularity of hazelnuts is on the rise in other countries, particularly Azerbaijan and Georgia. According to 2021 data, these two countries account for 11% of global hazelnut production and 10.8% of exports. Azerbaijan's main hazelnut importers are Italy, Russia, and Germany (FAO 2021). Moreover, of note is the fact that Georgia is a country to which the EU applies a customs duty exemption on imports from third countries (RTMCT 2022). Consequently, foreign purchasers tend to source their requirements from other hazelnut-producing countries, where prices are typically lower, and to import from Türkiye to meet their supply deficits. Besides, when Türkiye's export prices are high, it may be the case that Italy and Spain, Türkiye's biggest competitors, are able to sell at lower prices and deplete their stocks due to the support and transport advantages provided by the EU. This situation not only endangers the Turkish hazelnut industry but also indirectly affects hazelnut prices and results in the transfer of stocks (Gündüz et al. 2018). In order to circumvent this predicament, it is recommended that policies that encourage the production of in-demand hazelnut varieties be continued, and that investments be maintained to improve product quality and productivity. To develop Türkiye's hazelnut exports, increase current market share, and orient toward new markets, it is evident that a market management approach that incorporates the perspectives of all sector stakeholders is necessary by considering current supply and demand dynamics in the hazelnut market. Furthermore, marketing policies should be developed and implemented with the objective of increasing the export volume to overseas markets that present potential for Turkish hazelnuts. Advertising and promotional activities should be carried out in various countries that have been identified as target markets.

The small positive impact of AMCE indicates that Türkiye has made some adaptations in its product range for the European market. In order to increase this effect further, production and marketing strategies that can respond more flexibly and quickly to consumer trends and needs in Europe should be developed. By continuously monitoring consumer preferences and trends in Europe, it is possible to take steps to increase the share of hazelnuts in exports, both as raw materials and in processed hazelnut products, in accordance with consumer demands. Besides, it is also necessary to divide the European market into different segments (e.g., premium segment, organic segment) and develop separate marketing strategies for each segment. This should be achieved by producing hazelnuts in accordance with organic, sustainable agriculture and other quality certificates valid in Europe. It should be noted that our analysis focused on the six main EU markets accounting for over 87% of Türkiye's hazelnut exports. While this provides a robust representation of the market, the exclusion of smaller EU markets (<1% share) may introduce a selection bias. Future research could incorporate these smaller markets in a sensitivity analysis to evaluate their potential impact on the overall competitiveness and market dynamics.

The negative effects of the MSE and CAE indicate that Türkiye is experiencing difficulties in maintaining or increasing its overall market share. Furthermore, the adaptation of products to the European market is insufficient. As previously stated, the primary cause of this phenomenon can be attributed to the growing investment in hazelnut production across various countries. With younger hazelnut trees and modern agriculture applications, it has been observed that some countries have achieved better results than the yield of hazelnut production in Türkiye. For example, in the global context, the yield of hazelnuts in 2021 was 285 kg/decare in the United States and 180 kg/decare in Georgia, while Türkiye exhibited a comparatively lower yield of 93 kg/decare. In order to guarantee the longevity of Türkiye's leading position in the global hazelnut industry, it is imperative to enhance the productivity of hazelnut cultivation. In the forthcoming years, the competitive edge that Türkiye currently holds in the global hazelnut market may be eroded as other countries with high productivity levels expand their production areas. Also, the negative values of the MCE in certain periods suggest that Türkiye's hazelnut exports have not kept pace with the relative growth of some European market segments. For example, while the overall EU market for hazelnuts expanded, Türkiye's exports to countries like the Netherlands and Spain exhibited slower growth or stagnation. Moreover, Türkiye's limited presence in emerging Central and Eastern European markets may have reduced its ability to benefit from diversified demand growth across the EU. These findings highlight the need for broader market engagement and strategic diversification beyond traditional Western European partners. A similar situation is also present in the comparison of other periods.

The performance components of Türkiye's hazelnut export to the European market are shown in the Fig. 2. The main reason to increase the market share of Türkiye's exports is the CCE. Thus, this growth was mostly thanks to imports resulting from shifts in demand in favor of hazelnuts in the target market, but Türkiye has not been success-

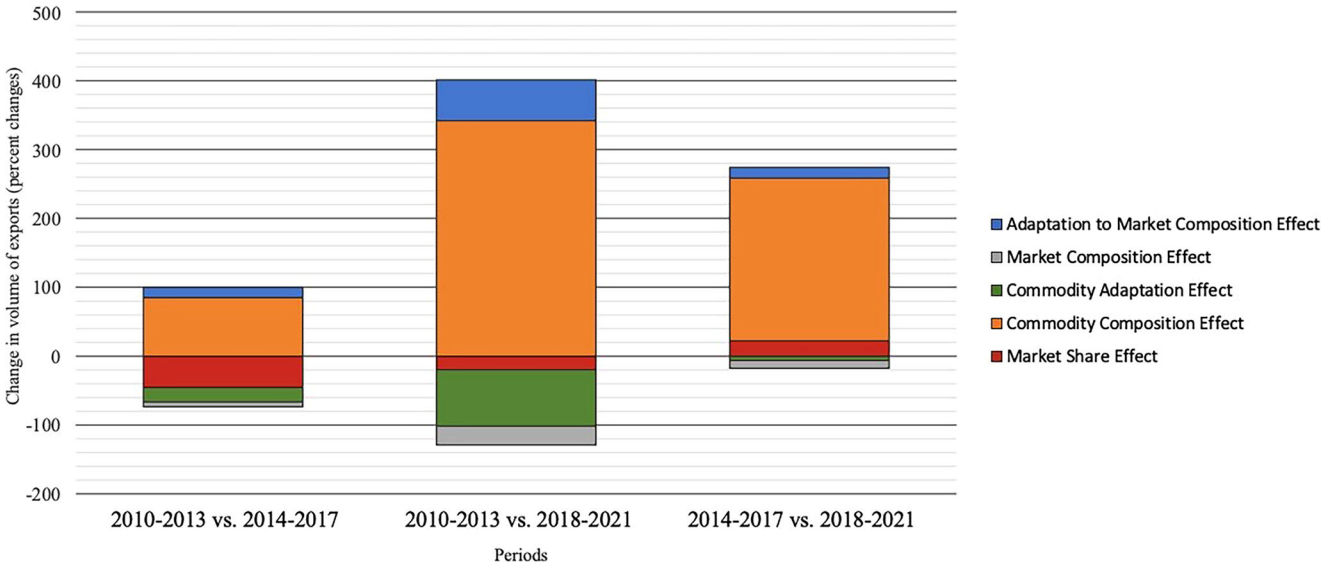


Fig. 2 Türkiye's export performance in the European hazelnut market in different periods (source: data from the International Trade Centre (2021) database)

ful enough in adapting to the change in this composition. Only in the last two comparison periods (2014–2017 vs. 2018–2021) did Türkiye's MMSE increase. In other words, hazelnut imports from Türkiye have increased within the hazelnut imports of the European market.

Conclusion

This study used constant market share (CMS) analysis to decompose the growth (in terms of quantity) of Türkiye's hazelnut (kernel basis) exports to the EU28 market. Türkiye's market share in the EU28 market increased from 2010 to 2021 due to the commodity composition effect (CCE) and adaptation to market composition effect (AMCE) components of CMS analysis. The results revealed that hazelnut is the right export product for the EU28 market. However, market share effect (MSE), commodity adaptation effect (CAE), and market composition effect (MCE) negatively affected market share growth in all comparisons across the periods, with the exception of the positive contribution of MSE in the comparison between period II and period III.

In order to minimize the factors affecting Türkiye's market share negatively, it is important to review competitive strategies, product quality, pricing methods, and investment in sustainable production methods. Developing Türkiye's production capacity to meet the increasing demand for organic and sustainable hazelnuts can help Türkiye to maintain and increase its market share in Europe. In this context, the promotion of organic certification, in consideration of EU certification requirements, has the potential to enhance product quality and address consumer demand for healthier options. Moreover, the provision of subsidies for yield-enhancing technologies can assist farmers in enhancing efficiency and maintaining competitiveness in international markets. Additionally, creating innovative products, offering unique product features, and adding high-value products to the export portfolio is crucial. Allocating more resources to market research and identifying target markets is key for Türkiye to respond more dynamically and flexibly to changing market conditions and European demand for hazelnuts. It is essential to update and diversify customer behavior analysis, product positioning, and marketing strategies. While the CMS analysis provides a decomposition of export performance, it does not explicitly control for external shocks such as climatic events or global market disruptions. Future research may consider combining CMS with regression-based approaches to account for such exogenous influences.

Diversifying the export network by strengthening relationships with other international markets is recommended considering the observed decline in the MCE. This approach should focus on exploring new and potential markets, analyzing existing markets, and utilizing external media and promotional channels for marketing. Further, financial incentives such as grants, loans, and tax exemptions can boost product competitiveness in international markets. Supporting companies that develop innovative and high-value products can promote entrepreneurial activity in hazelnut exports. Moreover, considering the increasing shares of Azerbaijan and Georgia in hazelnut production and trade, joint marketing strategies or regional collaborations can be considered.

In summary, in order for Türkiye to maintain its leadership in the sector and strengthen its position in the market, evaluations and strategic action plans should be implemented in various areas such as product diversity, market alignment, global competitiveness, and local production capacity.

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