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The analysis of competitiveness of Mediterranean countries in the world citrus trade

Sinan DURU[1], Seyit HAYRAN[2], Aykut GÜL[2]

[1]Minister of Trade, Central Mediterranean Customs and Foreign Trade Regional Directorate, Mersin, Turkey
[2]Cukurova University, Faculty of Agriculture, Department of Agricultural Economics, Adana, Turkey

Corresponding author: S. Duru, e-mail: s.duru85@hotmail.com
Author(s) e-mail: hayran86@hotmail.com, aykutgul@gmail.com

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ABSTRACT

With their low calorie and rich nutrient content, citrus fruits are an important element of the daily diets of individuals living in Mediterranean countries. Although the origin of citrus fruits lies in Southeast Asia, today the Mediterranean Basin comes to the fore in terms of production and trade. In this study, the competitiveness of the countries in the Mediterranean Basin, which has a coast to the Mediterranean, in the world citrus trade between 2005-2019 was competitiveness demonstrated. for this research, Balassa's relative comparative advantages, revealed symmetric comparative advantage and Lafay indexes are used. As a result of the study, the rate of increase in the total production and exports of the can countries in the Mediterranean Basin is realized under the world average. However, the noticeable dynamic increase in the production and exports of the developing countries in the region ensures the continuity of the competitive power of the Mediterranean Basin. To increase the market competitiveness of the region, it is suggested that state policies make citrus production activities an important issue.

1. Introduction

Citrus is the general name given to high value-added fruits such as oranges, tangerines, lemons, grapefruit, and bergamot, which are the most commonly grown. Citrus fruits are rich in vitamin C, minerals, and carotenoids, in addition to being consumed as food due to their abundances. Owing to their phenol content, the essential oils obtained from the shell, leaves, and flowers allow them to be used in the perfumery sector (Duarte et al. 2016; Ozer and Köksal 2016).

Citrus fruits require a lot of water, the optimum growing temperature is 23-30 ºC. Citrus fruits, which start to bear fruit at the end of three years, are economically efficient from the fifth year. The yield varies from year to year, the most fruitful tree is the orange species. Few of the citrus flowers bear fruit is given, the longest flowering period is lemon species (FAO 2020).

Citrus fruits, which have a history of about 20 million years, have their origin in Southeast Asia, and their spread to the Mediterranean and other regions goes back to before Christ. The Mediterranean climate has provided a suitable environment for the cultivation of many agricultural products, and in particular citrus fruits (Barcikowska et al. 2020). Citrus fruits have spread to the American continent, especially through Spanish and Portuguese explorers, with the effect of geographical discoveries since the 15th century, and since this date, its production, processing, and trade have significantly (Liu et al. 2012This situation has continued until today (2019), it has been the most trade fresh fruit and vegetable product group in the world. (TradeMap 2020).

There has been a lot of research done in literature on the citrus economy of the countries in the Mediterranean Basin. Some of this research was conducted on the citrus production of the countries in the Mediterranean Basin and the general structure of the sector (D'Onghia and Lacirignola 2009), and the political effects of the increase in citrus production in the Mediterranean Basin countries located in the European continent (Schimmenti et al. 2013). In country-based research, Turkey's; competitiveness of citrus exports in the European Union market (D'Onghia and Lacirignola 2009), the factors affecting the export of citrus using a gravity model analysis (Ozer and Koksal 2016), and competitive analysis of citrus exports (Fidan 2009; Kadanalı 2019), quality assurance in citrus exports in Morocco (Oubahou and Otmani 2000), economic analysis of Egypt's orange exports (Ali 2014) and competitiveness (Hassanain and Gabr 2020), the competitiveness of Spain's orange sector in Europe (Ben-Amor and De-Miguel 2020) and the impact of citrus exports on the economy in Tunisia (Bakari 2018) were investigated.

In the first part of this study, the place and importance of citrus production and export of the world and Mediterranean countries in the world economy are mentioned. In the second stage, the competitiveness of the Mediterranean Basin countries in the citrus exports of the Mediterranean Basin countries in the last 15 years (2005-2019) was analyzed comparatively. In the last part of the study, some policy recommendations for the improvement of citrus production were suggested based on research findings.

2. Materials and Methods

The main material of the study is composed of secondary data on citrus exports of the countries in the Mediterranean Basin for the period 2005-2019. The Basin surrounding the Mediterranean consists of 21 countries which are located in Europe, Asia, and Africa (United Nations 2020). Since no data on citrus exports from Malta, Libya and Monaco could be found, the research was conducted on data from 18 countries. The data of 8 countries with a citrus export value of $ 100,000 in 2019 and above from 18 countries within the scope of the research are analyzed in detail (TradeMap 2020).

The research data were obtained from databases on TradeMap and FAOSTAT (Food and Agriculture Organization Corporate Statistical Database). Export data of countries in the World and Mediterranean Basin in US dollars, the TradeMap database were based on the harmonised product classification with code digit "Commodity Description and Code System HS-4" according to the product definition of 0805 "Citrus fruit, fresh or dried". According to the HS-6 Code system, citrus fruits are orange, tangerine, grapefruit, lemon, and lime (TradeMap 2020).

For this research, to determine the comparative advantages of citrus exports of countries in the Mediterranean Basin, Balassa's revealed comparative advantages (RCA) and revealed symmetric comparative advantages (RSCA) index were used. Also, the Lafay index has been applied to determine the effects of citrus fruits on the trade balance.

The RCA index which was first put forward by Liesner in 1958, was named the Balassa index because it was developed by Balassa in 1965. An index, in general, is determined by the strong or weak sectors by measuring the share of one or a group of goods of a country in total exports of the same country (Ben-Amor and De Miguel 2020).

$$RCA = \frac{X_{ij} / X_j}{X_{iw} / X_w} \qquad (1)$$

X_{ij}= Exports of good i of j country (Citrus exports of Mediterranean Basin countries)

X_j= Exports of all goods of j country (Total exports of Mediterranean Basin countries)

X_{iw}= Total world exports of good i (Total World citrus export)

X_w= Total world's exports in year t is defined.

The use of the RCA index is limited by the fact that it cannot explain the competitiveness in trade based on the concept of performance and related variables, does not take imports as a basis, ignores international trade policies, and is asymmetric because it takes zero and infinite values (Rosatto et al. 2018). Dalum et al. (1998) introduced the RSCA index to correct the asymmetry intended for the advantage or disadvantage of the RCA index. It takes values between -1 and +1, indicates a comparative disadvantage if the index value is between -1 and 0, and comparative advantage between 0 and +1 (Rosatto et al. 2018). RSCA Index equation;

$$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1) \qquad (2)$$

In addition to the measurement of competitiveness, the effects of a country on the balance of foreign trade in a product were taken into account with the index proposed by Lafay (1992) and it is determined whether the product is a net importer or exporter by comparing it with the theoretical trade balance. In the calculation of the Lafay index, due to the consideration of imports, can more powerful information value, takes macroeconomic distortions into account, and better analyzes competitiveness on a product basis (Burianová and Belová 2012).

$$LFI_j^i = \left[\frac{X_j^i - M_j^i}{X_j^i + M_j^i} - \frac{\sum_{j=1}^{N}(X_j^i - M_j^i)}{\sum_{j=1}^{N}(X_j^i + M_j^i)}\right] \frac{X_j^i + M_j^i}{\sum_{j=1}^{N}(X_j^i + M_j^i)} \qquad (3)$$

X^i_j= export of good "i" in period "t" of country "j";

M^i_j= import of good "i" in period "t" of country "j";

$\sum X^i_j$= total export on period "t" of country "j";

$\sum M^i_j$= total import on period "t" of country "j" is expressed.

3. Results and Discussion

3.1. Citrus production and export of Mediterranean countries

The Mediterranean Basin differs from the global system not only with its geographical borders within the vast land but also its historical, cultural and economic characteristics (Galchina et al. 2019). Besides these features, climatic, topographic and geological conditions of the basin, especially citrus fruits it provides high product productivity in perennial plants such as olives, almonds and grapes. (Cayuela et al. 2017).

From the time of the Roman Empire in the Mediterranean Basin, citrus fruits cultivation has become the main product in agricultural fields with the developments in agricultural technology since the 20th century (Duarte et al. 2016). The Mediterranean Basin realised 18% of the world citrus production at the end of 2019 (FAOSTAT 2020). In this period, although the Mediterranean Basin increased its citrus production by 29.17%, the rate of increase remained below the world average. When examined based on countries, the highest increase rate occurred in Algeria, Morocco, and Syria, respectively (Table 1). The National Agricultural Development Program (UNDP) initiated by Algeria in the 2000s and Morocco's support for developing citrus cultivated areas and irrigation systems contributed to this increase (Laoubi et al. 2010; Verner et al. 2018).

Table 1. Citrus production of Mediterranean countries (Thousand ton)

Country	Years		Change (%)	Country	Years		Change (%)
	2005	2019			2005	2019	
Spain	5310716	6008570	13.14	Algeria	627406	1583492	152.39
Egypt	2993030	4632701	54.78	Syria	610460	1177911	92.97
Turkey	2910000	4299185	47.74	Greece	1153189	1085080	-5.91
Italy	3488889	2864970	-17.88	Others	2159713	1529498	-29.18
Morocco	1320400	2604291	99.96	Total	19963313	25785698	29.17

Source: FAOSTAT (2020)

While the Mediterranean Basin had 57% of the world citrus exports in 2005, at the end of 2019 this rate had decreased to 46% (TradeMap 2020). In the period examined, although the citrus exports in the Mediterranean Basin increased by more than 50%, its share in the world decreased due to being below the world average. In the period covering the research, Egypt realised the highest increase in exports by eight times, and an increase was recorded in all of the leading countries (Table 2). One of the main reasons for this rapid increase in Egypt was that the target market, the EU, provided a preferential trade opportunity in orange exports (Spreen et al. 2020).

When the production and export shares of the Mediterranean countries are examined, Spain leads the production and exports. Spain's export share is more than twice its share in production. The main reasons for this are that the Valencia and Castellón regions, which realise 60% of the citrus production in Spain, contain a logistics network that can quickly reach large-scale distribution and the privilege of trade provided by the EU membership (Rose 2020).

In the developing countries of the Mediterranean Basin, the citrus sector is effectively supported by governments for its productive and economic contribution (Schimmenti et al. 2013). The demand for products in certain standards of the EU, which is the largest market in citrus exports of North African countries, ensured that breeding work became a state policy in these countries. Breeding studies have contributed to citrus fruits to provide product quality and unique features and have become an indicator that it will contribute to competitiveness (Oubahou and Otmani 2000; D'Onghia and Lacirignola 2009).

3.2. Measurement of competitiveness in citrus trade of the Mediterranean countries

With the effect of globalisation, countries are making intense efforts to increase their competitiveness and get a larger share of the world trade. The economic literature suggests the use of indices to measure competitiveness. Although global competition indexes are generally applied at a national level, studies on the impact of exports on competitiveness and performance have also gained the attention of researchers (Dobrovic et al. 2018; Buchalter 2019).

The RCA index, although it causes various discussions from time to time since it cannot explain some macroeconomic factors (Oelgemöller 2013; Rosatto et al. 2018), is a widely used competitiveness index, as it determines the strengths and weaknesses of the sectors and goods in international trade.. RCA index values made during the research period, which reveal the competitive power according to the citrus export performance of Mediterranean countries, are presented in Table 3. Morocco was the most competitive country according to index values of RCA, followed by Egypt, Spain, and Greece. Except for Italy, France, and Israel, the average RCA index value of other countries are over four, and these countries have high competitive power. In the period examined, only three of the eight countries with the highest citrus exports have increased in the average RCA index. The Mediterranean Basin, in general, has maintained its competitive power although there has been a slight decline in the RCA index averages. Egypt has realised the highest increase in index value with 186.35%, followed by Israel with 25.83% and Italy with 12.38%. Morocco has the highest index value, lack of competitiveness, trade pressures and inability to keep up with changing market conditions limited its potential and index decreased by half. (Schimmenti et al. 2013). However, the fact that Spainish owned markets supply the production deficiencies from Morocco has contributed to the continuation of Morocco's export power (Ben-Amor and De Miguel 2020).

The results regarding RSCA index values, which eliminate the asymmetric structure of the RCA Index, are presented in Table 4. Except for Italy and France, citrus exports of leading Mediterranean Basin countries, RSCA index values are taken to be positive. The country with the highest index value is Morocco, followed by Egypt and Spain. The total RSCA index value of other Mediterranean countries is close to zero, while all Mediterranean countries have a high RSCA index value of 0.66 in the competition index. According to this result, the fact that the leading citrus exporters from the Mediterranean countries have high RSCA shows that both these countries and the Mediterranean Basin have a high comparative advantage and a high share of citrus exports in total exports. Naseer et al. (2019) reported that three of the five countries with the highest RSCA index in the world during the 2007-2016 period are countries located in the Mediterranean Basin such as Spain, Turkey and Morocco.

Lafay index values, which reveal the balance of citrus fruits in foreign trade, are given in Table 5. During this period, leading countries other than France and Italy had a comparative advantage over the Lafay index. Moreover, Egypt realised the highest increase in the Lafay index value with 224% followed by Israel with a 46% increase. Egypt has the highest average Lafay index value with 0.87 in the 15 years, followed by Morocco (0.81) and Spain (0.66). Ben-Amor and De Miguel (2020) reported that the countries with the highest market share in the citrus market of Mediterranean countries in the period 1994-2013 were Spain, Egypt, Greece, and Morocco, respectively.

Table 2. Citrus export values of Mediterranean countries (Thousand $)

Country	Years		Change (%)	Country	Years		Change (%)
	2005	2019			2005	2019	
Spain	2669238	3580279	34.13	Greece	122508	204452	66.89
Turkey	404844	751172	85.55	Israel	95310	180391	89.27
Egypt	82511	748286	806.89	France	86074	115188	33.82
Morocco	341394	496432	45.41	Others	87476	68667	-21.50
Italy	143526	253556	76.66	Total	4032881	6398423	58.66

Source: TRADEMAP (2020)

Table 3. RCA index values in citrus exports of Mediterranean countries

Years	Spain	Turkey	Egypt	Morocco	Italy	Greece	Israel	France	Other country	All country
2005	20.52	8.17	11.49	45.23	0.57	10.41	3.30	0.29	1.35	4.77
2006	21.37	8.93	8.77	35.77	0.58	10.41	2.78	0.25	1.37	4.82
2007	21.08	7.63	10.51	29.08	0.61	11.26	3.31	0.27	1.20	4.75
2008	19.55	6.67	23.93	31.67	0.76	10.91	2.52	0.27	1.58	4.82
2009	18.63	9.30	26.52	26.80	0.64	11.68	3.49	0.24	2.25	5.08
2010	18.31	10.06	26.22	28.60	0.83	13.09	3.79	0.32	2.50	5.25
2011	17.62	11.99	27.32	34.47	0.74	12.10	3.46	0.26	1.18	5.31
2012	18.84	9.07	25.67	25.82	0.64	9.64	4.62	0.32	1.18	5.24
2013	17.83	8.84	26.69	26.67	0.67	9.80	4.08	0.30	1.03	5.17
2014	17.38	8.57	25.70	22.82	0.65	8.98	4.27	0.32	1.26	5.05
2015	17.23	7.51	31.16	22.94	0.62	7.96	3.65	0.32	0.88	4.98
2016	14.84	7.44	29.72	18.79	0.71	11.52	3.57	0.30	1.00	4.65
2017	14.91	6.88	30.46	19.02	0.64	7.23	4.22	0.34	0.69	4.60
2018	13.89	6.85	33.77	19.64	0.70	7.61	4.19	0.29	0.70	4.53
2019	14.30	5.91	32.89	22.78	0.64	7.27	4.16	0.28	0.75	4.59
Mean	17.75	8.26	24.72	27.34	0.67	9.99	3.69	0.29	1.26	4.91
%	-30.33	-27.61	186.35	-49.63	12.38	-30.22	25.83	-4.86	-44.67	-3.84

Table 4. RSCA index values in citrus exports of Mediterranean countries

Years	Spain	Turkey	Egypt	Morocco	Italy	Greece	Israel	France	Other country	All country
2005	0.91	0.78	0.84	0.96	-0.27	0.82	0.53	-0.55	0.15	0.65
2006	0.91	0.80	0.80	0.95	-0.27	0.82	0.47	-0.60	0.16	0.66
2007	0.91	0.77	0.83	0.93	-0.24	0.84	0.54	-0.57	0.09	0.65
2008	0.90	0.74	0.92	0.94	-0.14	0.83	0.43	-0.57	0.22	0.66
2009	0.90	0.81	0.93	0.93	-0.22	0.84	0.55	-0.61	0.38	0.67
2010	0.90	0.82	0.93	0.93	-0.09	0.86	0.58	-0.52	0.43	0.68
2011	0.89	0.85	0.93	0.94	-0.15	0.85	0.55	-0.59	0.08	0.68
2012	0.90	0.80	0.93	0.93	-0.22	0.81	0.64	-0.52	0.08	0.68
2013	0.89	0.80	0.93	0.93	-0.20	0.81	0.61	-0.54	0.01	0.68
2014	0.89	0.79	0.93	0.92	-0.21	0.80	0.62	-0.52	0.12	0.67
2015	0.89	0.76	0.94	0.92	-0.23	0.78	0.57	-0.52	-0.06	0.67
2016	0.87	0.76	0.93	0.90	-0.17	0.84	0.56	-0.54	0.00	0.65
2017	0.87	0.75	0.94	0.90	-0.22	0.76	0.62	-0.49	-0.18	0.64
2018	0.87	0.75	0.94	0.90	-0.18	0.77	0.61	-0.55	-0.18	0.64
2019	0.87	0.71	0.94	0.92	-0.22	0.76	0.61	-0.56	-0.14	0.64
Mean	0.89	0.78	0.91	0.93	-0.20	0.81	0.57	0.29	1.26	4.91
%	-4.17	-9.12	12.04	-4.27	19.85	-8.07	14.49	-2.20	-195.92	-1.71

Table 5. Lafay index values in citrus exports of Mediterranean countries

Years	Spain	Turkey	Egypt	Morocco	Italy	Greece	Israel	France	Other Country	All country
2005	0.80	0.23	0.36	1.00	0.00	0.58	0.11	-0.07	0	0.11
2006	0.75	0.22	0.25	0.89	-0.01	0.49	0.08	-0.07	-0.01	0.10
2007	0.77	0.20	0.31	0.72	-0.01	0.60	0.11	-0.07	-0.02	0.09
2008	0.73	0.19	0.76	0.85	-0.01	0.59	0.08	-0.07	-0.03	0.09
2009	0.84	0.34	1.10	0.87	-0.02	0.76	0.14	-0.07	0.02	0.15
2010	0.73	0.32	0.98	0.88	0.00	0.69	0.14	-0.07	0.02	0.14
2011	0.61	0.33	0.89	0.83	-0.01	0.51	0.12	-0.05	-0.03	0.12
2012	0.62	0.26	0.80	0.69	-0.02	0.38	0.16	-0.06	-0.04	0.11
2013	0.61	0.26	0.88	0.76	-0.02	0.40	0.15	-0.07	-0.04	0.11
2014	0.60	0.26	0.83	0.66	-0.02	0.37	0.15	-0.06	-0.04	0.11
2015	0.66	0.26	1.11	0.77	-0.03	0.35	0.14	-0.08	-0.04	0.13
2016	0.59	0.28	1.19	0.69	-0.02	0.57	0.15	-0.09	-0.02	0.13
2017	0.58	0.24	1.15	0.67	-0.03	0.33	0.17	-0.08	-0.04	0.11
2018	0.53	0.24	1.22	0.68	-0.02	0.34	0.17	-0.07	-0.04	0.10
2019	0.53	0.21	1.16	0.77	-0.02	0.31	0.17	-0.07	-0.04	0.11
Mean	0.66	0.25	0.87	0.81	-0.01	0.48	0.14	-0.07	-0.05	0.11
%	-33.17	-9.12	-4.27	19.85	-8.07	14.49	-2.20	-195.92	-1.71	0.00

As a result of the research it was revealed that the countries located in the Mediterranean Basin have high competitive power in citrus exports. In the analysis, Egypt, which achieved the biggest increase proportionally and in quantity in citrus production and exports, also achieved the highest increase in the competitiveness indexes. The most important reason for this is that Egypt supplies oranges at a more affordable price, in the competitive Saudi Arabia, Russia and Holland markets (Hassanain and Gabr 2020). Spain and Morocco respectively followed Egypt as the countries with the highest competitive index. The low share of Turkey's citrus exports in total exports has resulted in a low competitiveness index. Seleka and Obi (2018) reported that Spain and Morocco were the countries that increased their citrus competitiveness the most between 1961 and 2013. Italy and France have less competitive power than other countries. Although the citrus exports of these two countries increased, the increase in the exports of other sectors led to a decrease in competitiveness (TradeMap 2020). Since the research period did not cover the pandemic process, price changes and competitiveness effects could not be determined during this period.

4. Conclusion

As a result of the research, it has been observed that there was a slight decrease in the competition index values of citrus exports of the countries in the Mediterranean Basin during the period examined. However, the research results showed that in world citrus exports, the competitive structures of the countries in the Mediterranean Basin are still strong and that they carry on their important positions in exports. EU countries, whose citrus exports are low in their total exports, have a low competitiveness index and it is expected that this rate will continue to decrease. Although Spain and Turkey come first and sixth in the world, respectively, the high share of citrus exports of countries such as Egypt and Morocco in total exports has led these two countries to come to the fore in the comparative advantage indices.

Mediterranean countries, especially in Europe, because of their proximity to export markets and the advantage of EU member basin countries such as Spain, Italy, and Greece in international trade contributes to the increase of competitive power in citrus fruits. Countries outside other countries than these, European Union provides opportunity to preferential trade opportunity and Spain has met from this country the products in need of the market. And also these countries adopt as a state policy to carry out breeding activities in citrus varieties by their institutions or organizations, shows that the competitiveness can be maintained in citrus exports. Export leads to economic and social development. For this reason, it should be planned in a way that will continue to contribute to the development of North African countries with a high competitive index in citrus exports. To increase the added value provided by citrus exports, there should be an importance placed on macroeconomic policies that will ensure the stability of the value of the developing countries' currencies.

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