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COMPARATIVE ADVANTAGE ANALYSIS FOR TURKISH GRAPE AND CHERRIES EXPORT MARKET

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Abstract

Fresh fruits and vegetables production and exports is important for national income composition in Turkey. Turkey, while being a net exporter, faces increasing competition from emerging markets as well as the existing competitors. Despite the Mediterranean supremacy in the fresh vegetables market, fruits market faces overseas competition. While, Chile and the USA rank as the first and the second for grape market, Turkey ranks as the eight. In addition, following the USA, Chile and Hong Kong, Turkey is in the fourth rank for cherries. With this point of view, it was intended y to measure and interpret Turkish exports for these products with respect to main export competitors. Revealed competitiveness of Turkish grape market indicated that, Turkey was more advantageous than its competitors when imports were considered as well as exports, leaving Egypt and Greece behind. This RC index was estimated against exchange rates for 9 competing countries between 2008 and 2016. The results revealed that, cross sectional differences were visible in estimation of RC of Turkey and devaluation or valuation of currencies affect export performance as expected. Specifically inter-period devaluation of Turkish Lira, seemed to lead 1,59 points appreciation in the country's competitiveness, which was considerable with 2,32 average level. When cherries market was considered, Turkey appeared as superior rather than competitive. Only Poland was superior in some specific years. However, estimation of revealed competitiveness of Turkey did not yield an interpretable result due to repetitive structure of competing country exchange rates, which are completely EU members. Consequently, the findings indicated that Turkey has advantages in grape and cherries markets. Yet, the share of these products in overall fruit exports and potential market lines should be increased. This is also necessary to cope with the exchange rate risks as well.

Key words: export competition, indices, grape, cherries, Turkey, econometrics

Introduction

Being a Mediterranean country with abundant natural resources, Turkey has an advantageous situation in agricultural exports. Both fresh fruits and vegetables (FFVs) grown in the Mediterranean region and traditional dried fruits as grapes, figs and cherries are permanently exported to the world. Turkey's main export partners are its neighbours or European countries lacking valid environmental conditions for FFVs production. With altering economic conditions, overseas exports to emerging and recently developed markets like China have been increasing as well. The country has a significant share in the world in cherries and grape, including dried and fresh fruits. While supremacy of the country is on dried fruits, fresh exports have been increasing as well.

Turkey is one of the most important centres of fruit genetic resources and a lot of fruits grow naturally almost everywhere in Turkey (Okatan, 2018). The aggregate figures were indicated in Table 1 comparatively. While the grape orchards in the world had declined by 24 % from 9.3 to 7.1 million hectares, the amount produced rose by 80 % from 43 to 77 million tonnes. The declination in hectares of land for Turkey was 44 %, with corresponding rise in the amount produced by 25 %. Accordingly, the declination for amount of land is higher than the world average, while the rise in production is in the opposite direction.

Table 1. Grape Production Area and Amount – 1961&2016

	Area Turkey	Amount Turkey	Area World	Amount World
1961	775.000	3.189.000	9.333.213	42.987.956
2016	435.227	4.000.000	7.096.741	77.438.929

FAO, 2016

In addition it is necessary to overview the trade data. By 2009, Turkey seemed to overrule raisins market with a share of 31 % in total world exports (Miran, et al., 2015). There exist raisins and dried grapes imports as well, but the amount is almost negligible (Duran, 2003). However, considering the amount exported, Turkey seemed to offer lower than average market prices to cover the market.

When the grape orchards were considered simultaneously, 68 million tonnes of grape had been produced in 7 million hectares in the world in 2012. Turkey ranked the fifth with 246.296 hectares and sixth with 4.275.659 tonnes of grape production respecting the FAO data (FAO, 2012; Cebeci and Akin, 2012). The amount of land had risen to 435.227 hectares in 2016, while the total production had declined to 4 million tonnes (FAO, 2016). This declination also signed that the rise in production demonstrated in Table 1 is not a permanent one and there have been yearly differences. Departing from these recent figures, Turkey has been providing 5 % of total grapes produced in 6 % of total grape orchards. The major competitors were recorded as China, France, Italy and Spain while Chile, Australia and the USA had dominated the market recently. In addition, South African market has been developing for grape supplies directed to European markets as well (Müller, et al., 2009).

When we consider Turkish exports, it can be noted that 16 % of cherries produced, 65294 tonnes, was exported in 2010 with a return of 14,782 million Dollars (Gul, et al., 2016). In 2016, 107070 tonnes of cherries (including sour cherries) were harvested in 792.150 hectares. Therefore, Turkey used to supply 16 % of world cherries in 2016 due to FAO data (FAO, 2016). The evolution of cherries market also worth to be indicated.

As demonstrated in Table 2, while amount of hectares utilised for cherries production rose by three times, the rise in the amount was lower. Yet, while the hectares increased by five times, amount of production rose by ten times. This provided us the overall interpretation that, Turkey progressed more in cherries production than grapes and raisins in comparison with the development in the world.

Table 2. Cherries (Sour cherries included) Production Area and Amount – 1961&2016

	Area Turkey	Amount Turkey	Area World	Amount World
1961	17.210	71.200	156.727	1.840.696
2016	107.070	792.150	654.088	3.696.172

FAO, 2016

It was also understood that Turkish cherry market has been growing due to the demand from the western European countries, especially Germany. While cherry production has been increasing permanently since 1980s, Turkish cherries constitute 19 % of supplies including sweet and sour cherry (Gul, et al., 2016). The most prominent competitors have been the United States, Iran, Poland, Italy, Spain, Romania and Russian Federation, with inclusion of Chile recently.

In their study, where an indexing to show the improvements in cherry market was used, Gul and his friends (2016) also indicated that while amount of cherries produced in the world had risen by 227 % between 1990 and 2010, the rise had been 937,65 % for Turkey in the same period. By 2014, while total cherries exports appeared as 1.9 billion Dollars. Chile ranked the first with 659,676 million Dollars capturing 34,51 % of the market. Chile was followed by the USA with 24,85 % and Turkey by 7,59 % (Cercinli and Bal, 2016, Anonymous, 2015).

Looking at the figures, it was understood that measuring and interpreting the comparative situation for Turkey, considering its competitors' situation is essential. The comparative analysis, watching the alterations in the export market, is expected to provide insights for improvement of the market for grapes and cherries. Therefore, competitiveness of the markets were analysed respecting significant rivals and altering conditions in the scope of this study.

Material and Methodology

Data

For cross comparison in grapes and cherries markets, secondary data withdrawn from trade data banks were used. The data range varied for separate comparisons due to data availability and it was demonstrated below.

Grapes			Cherries		
Competing Countries		Data Range	Competing Countries		Data Range
Spain, Italy, Greece, Australia, Turkey		1996-2017	Spain, Italy, Greece, Poland, the Netherlands, Turkey		1996-2017
The Netherlands, France, China		1996-2016	France		1996-2016
Egypt		2008-2017			
South Africa		2000-2017			

The data utilised were quantity imported and exported by the country and the export income and import expenditures, withdrawn from the United Nations international trade statistics databases (UN COMTRADE, 2018). In addition, the aggregate figures referring to exports of 'edible fruit, nuts, peel of citrus fruit, melons' were used for computation..

Methods

There are three major indices incorporated to measure export performance of a country. These are revealed comparative advantage, revealed competitiveness and comparative export performance indices. Accordingly, it is first necessary to introduce the indices that were utilised within this study.

Revealed Comparative Advantage (RCA) Index

Revealed comparative advantage (RCA) index, provides evidence on export performance of a specific market or industry in comparison with one or more rival countries. Itwas introduced by Balassa (1965), whom the index was named after and is calculated as:

$$RCA_{ij} = \left[\left(\frac{x_{ij}}{x_{it}} \right) \div \left(\frac{x_{nj}}{x_{nt}} \right) \right]$$

Where:

$RCAij$ = Revealed Comparative Advantage of country i on commodity j

Xij = Country i's exports of commodity j to the world

Xit = Country i's total 'edible fruit, nuts, peel of citrus fruit, melons' export to the world

Xnj = Country n's export of commodity j to the world

Xnt = Country n's total 'edible fruit, nuts, peel of citrus fruit, melons' export to the world

The values of the index vary from 0 to infinity (0<RCAij≤ ∞). The country i seemed to have comparative advantage on product j if the index is greater than 1 (RCAij>1), otherwise, there considered a disadvantage in comparison with the rival country. RCA has been used to interpret sectoral specialisation on macro level in different sectors and countries (Jaimovich and Meralla, 2015). If two country has indices very close to each other, this means the amount and income of exports affect these two countries significantly in the adverse direction (French, 2017).

Revealed Competitiveness (RC) Index

Lately, it was considered that trade competitiveness cannot be measured without considering the imports. Vollrath (1987, 1989 and 1991) and Vollrath and De Huu Vo (1990) defined revealed trade advantage by deducting imports from exports and introduced Revealed Competitiveness after normalisation of export and import data with logarithm (Ferto and Hubbard, 2003). The index refers to the difference between aggregate agricultural exports and imports. Yet, within this study, the index was interpreted respecting the products selected.

$$RC_i = lnRXA_i - lnRMA_i$$

Where,

RC_i = Revealed Competitiveness of country i (product specific)

$lnRXA_i$ = Country i's total agricultural export to the world (product specific)

$\mathbf{lnRMA}_i$= Country i's total agricultural import to the world (product specific)

RC index ranges between -∞ and ∞ and can take any positive or negative value. A positive index refers to the comparative advantage for the country and for product, while a negative index signs the disadvantageous position. Therefore, revealed competitiveness provides information on the trade balance.

Comparative Export Performance (CEP) Index

An aggregate comparison can be achieved for the selected product range via comparative export performance. This index measures, whether the product has significance for the export revenues of concerned countries and it considers the share of the export revenue retrieved from the specific product in comparison with total agricultural exports(Serin and Civan, 2008).

$$CEP_{ij} = ln\,[(X_{ij}/X_{iT})\,/\,(X_{nj}/X_{nT})]$$

$\boldsymbol{CEP}_{ij}$ = Comparative Export Performance of country i for good j

$\boldsymbol{X}_{ij}$= Country i's export of good j to world

$\boldsymbol{X}_{iT}$= Country i's total 'edible fruit, nuts, peel of citrus fruit, melons' exports to world

$\boldsymbol{X}_{nj}$= The rival country's (country n) export of good j to world

$\boldsymbol{X}_{nT}$= The rival country's (country n) total 'edible fruit, nuts, peel of citrus fruit, melons' exports to world

The index is evaluated between rivals considering which has higher value. The country with higher CEP is said to have comparative advantage over the other.

Relationship between Trade Comparison and Exchange Rates

Following computation of these indices, it was intended to understand the underlying effects. Within the scope of the study, the relationship between the selected index out of the computed ones and bilateral exchange rates were analysed using panel data analysis. A panel regression was estimated and the regression equation utilised and the variables are as following.

$$RC_{injt} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1} EXC_{it} + \boldsymbol{\beta_1} EXC_{nt} + \boldsymbol{e}_{int}$$

$\boldsymbol{RC}_{injt}$ = Revealed Competitiveness index measuring comparative advantage of Turkey over country n for product j on time t

$\boldsymbol{EXC}_{it}$ = Exchange rate of Turkey (Turkish Lira in Dollars)

$\boldsymbol{EXC}_{nt}$ = Exchange rate of country n (Local currency in Dollars)

$\boldsymbol{e}_{int}$ = Error term including time and country dimensions to be estimated.

For the mentioned estimation, the methodological approach was selected from Fixed Effects, Random Effects and Panel Least Squares estimation following specification tests (Arrelano, 2003). The tests concerned are panel unit root tests to consider variation in time (Levin and Lin 1992, 1993; Levin, Lin and Chu 2002), panel-cointegration test to purify time effect (Pedroni, 1999). Cross-sectional dependency tests to decide on the estimation methodology were utilised following Lagrange Multiplier assessment via Bresuch and Godfrey test (Breusch-Pagan 1979; Godfrey 1978).

Panel estimation for grapes and cherries were conducted separately in order to comment on the product market. The dependent variable for these markets was Revealed Competitiveness which includes export and import advantages of Turkey against its competitors. For grape market the RC of Turkey in contrast to 9 competing countries was estimated between 2008 and 2016, while the number of competitors was 6 for 2004 and 2016 in cherries market due to data availability.

There have been various studies incorporating the index comparison methodology. As an instance, Turkey's comparative situation was analysed for tomatoes, olive oil and fruit juices in the verge of the EU accession process for 1995 and2005 (Serin and Civan, 2008:25-41). The comparison with Mediterranean competitors Greece, Italy and Spain revealed that Turkey used to have advantages over these rivals for olive oil and fruit juices, yet disadvantage for tomatoes considering multiple regression analyses relating price and income changes to change in exports for the relevant countries. The results indicated that countries that have macroeconomic or sectoral advantage tend to converge to each other (Eaton and Kortum, 2002). This also implied that, both advantageous and disadvantageous countries maintain their positions, if no specific movement is observed in trade sufficiency (Deardorff, 2013).

Utkulu and Seymen (2004) indicated that Turkey has strict advantage in fresh fruits and vegetables in comparison with EU 15, prior to eastern enlargement. They used different modifications of RCA index and discovered that Turkey had advantage on sugar, sugar preparations and honey, oil and oilseeds and tobacco as well as FFVs. Sahinli (2014) calculated competitiveness for 619 products between 2000 and 2011. Turkey appeared as advantageous for 79 products like nuts, cottonseed, specific FFVs, tobacco.Departing from these indices, it was intended to compare Turkey's performance in grapes (dried included) and cherries with the existing and potential competitors.

Findings

Prior to calculation and comparison of the indices, it was intended to demonstrate Turkey's progress in exports and imports of products in time. The change in grape market was shown in Figure 1, with reference to exported quantity and export income obtained nationally.
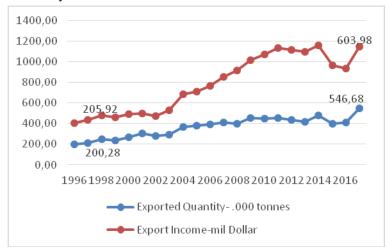

Figure 1. Amount of Exported Grapes (dried included) and Export Revenue (1996-2017)

The rise in amount exported and export revenue retrieved were comparatively in line. Yet, it can be noted that export income had risen (197 %) by slightly more than the amount exported (173 %) in those 20 years. However, the country had almost negligible import of grapes. While the amount imported had varied in years, 3,6 thousand tonnes of grape were exported in 1996 and it had declined to 2,22 thousand tonnes. Yet, import expenditures changed in the adverse direction as 5,81 million Dollars were paid for grapes imported in 2017, while the expenditure was 2,08 million Dollars. This also signed that import expenditures per thousand tonnes of grapes had raised significantly within time by 353 % in 20 years, and this needs to be analysed further.

In addition, the change in cherries market was analysed as well. As can be observed from Figure 2, the variation in export revenue is more visible for fresh cherries. While the amount exported had risen by 279 %, the export revenue obtained had increased more than five times (529 %). This seemed to be interrelated with increasing demand specifically from the European countries, but its attachment with changing economic conditions should also be analysed.

Figure 2. Amount of Exported Fresh Cherries and Export Revenue (1996-2017)

In addition, although there seems a drastic rise in cherries imported and import expenditures between 1996 and 2017, the import dependence is almost negligible. Amount of cherries imported was 3 tonnes in 1996, which rose to 32

tonnes. The expenditures rose from 2 thousand Dollars to 59 thousand Dollars. There had been statistical variation in the amount imported within the time, which can be attributed to changing yields and preferences of consumers. Following this brief evaluation, it is essential to undertake the comparative analysis for these products.

Grape Market

Even though the computations took place in export revenue and import expenditures, it was first intended to demonstrate the change in the amount exported by the countries. As mentioned earlier, Turkey ranks the third for grape and raisins exports after the USA and Chile. Turkish exports were 200 thousand tonnes, which had risen to 547 thousand tonnes. Yet, Italy had exported 3 times more than Turkey by 1996. However, Turkey passed Italy by 2017 due to the declination in Italian exports.
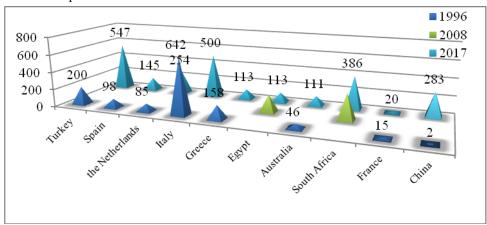

Figure 3. Amount of Exported Grapes for Turkey and Its Competitors (1996-2017)[1]

In continuity, the indices calculated were demonstrated in Table 3. For Revealed Comparative Advantage Index, it was understood that there has been a significant comparative advantage in grape exports over China, France, Spain and the Netherlands. For the other competitors, there appeared no sustainable supremacy. The RCA index between Turkey and Italy, Egypt, Australia and Greece were very close to 1, and there were some advantageous years. Yet, this can be translated as there appeared a convergence between these countries having similar agricultural endowments. However, it is also important to note that the RCA between China has been in a declination trend that the index of 37 in 1996 had declined to 1,1 in 2016. The same trend was observed with Spain and France even while the declination was lower than China.

When import of grapes was considered as well, Turkey overrides all countries except Greece and Egypt due to Revealed Competitiveness calculation. When Comparative Export Performance was considered, the country loses its advantage over many of the countries. For the traditional raisins and grape exports, Turkey keeps its advantage over France, China, Spain and the Netherlands. While the close Mediterranean competitors and relatively superior Australia markets beat Turkish market.

Table 3. Comparative Advantage Indices of Turkish Grape Exports for Selected Years

RCA - REVEALED COMPARATIVE ADVANTAGE									
	Spain	**the Netherlands**	**Italy**	**Greece**	**Egypt**	**Australia**	**S. Africa**	**France**	**China**
1996	7,17	1,93	0,82	0,51		0,84		14,11	37,59
2000	7,34	1,58	0,82	0,51		1,31	0,69	12,19	80,76
2010	4,89	1,14	0,88	0,81	0,83	1,15	0,78	8,71	2,73
2016	3,82	1,22	0,71	0,82	0,77	0,62	0,74	5,34	1,04
RC - REVEALED COMPETITIVENESS									
	Spain	**the Netherlands**	**Italy**	**Greece**	**Egypt**	**Australia**	**S. Africa**	**France**	**China**
1996	1,66	1,86	1,65	-1,09		0,29		3,21	3,16
2000	2,92	2,24	2,37	-0,72		1,88	0,28	3,65	5,80
2010	2,62	2,43	2,62	0,12	0,48	2,14	1,50	3,37	2,73
2016	2,33	2,46	2,66	0,18	-0,02	1,57	1,45	3,01	2,21
	Spain	**the Netherlands**	**Italy**	**Greece**	**Egypt**	**Australia**	**S. Africa**	**France**	**China**

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[1] Note: The first data recorded for South Africa was on 2000 and for Egypt was on 2008. The latest data recorded for France, the Netherlands and China was on 1996.

1996	1,97	0,66	-0,20	-0,68		-0,18		2,65	3,63
2000	1,99	0,46	-0,19	-0,68		0,27	-0,37	2,50	4,39
2010	1,59	0,13	-0,13	-0,20	-0,19	0,14	-0,25	2,16	1,00
2016	1,34	0,20	-0,34	-0,20	-0,26	-0,47	-0,30	1,67	0,03

Following this computation, it was intended to understand the underlying effects. Within the scope of the study, the correlations between the RC index, and bilateral exchange rates were estimated respecting the testing procedures and results were indicated in the following section.

Panel Estimation Results for Grape Market

First of all, it is important to note that the relationship estimation between competitiveness indicators and the bilateral exchange rates is an experimental research. The main intention was to seek whether there was a cross-country impact on competitiveness of relevant markets. Therefore, the impact of the exchange rates were analysed for 9 countries between 2008 and 2016.

Prior to the analysis, the normality of variables concerned were measured, The Jarque-Bera test results indicated non-normality of Revealed Competitiveness (7,20 with p:0,03), exchange rate of Turkey (9,8 with p:0,01) and exchange rate of competitive country (4353 with p:0,00). Following this, the correlation and co-movement of variables were tested with reference to time and space dimensions of the data set. The correlation between RC_{GRAPES} and EXC_{TR} was high (-0,23 with p:0,04) respecting the cross sectional dispersion with a negative sign. Yet, the relationship was insignificant for EXC_J (0,097 with p:0,3).

It was understood that RC_{GRAPES} was correlated with the exchange rates and there appeared both correlation (-0,061 with p:0,58) and covariance between the exchange rates as can be expected. For the concerned research methodology, correlated explanatory variables are not supposed to be used simultaneously (Gujarati, 2003). Yet, it was decided to neglect this assumption and proceed with finding an interpretable relationship. As the non-normality was confirmed, it was intended to seek time continuity of variables. Panel unit root test was applied accordingly both in level and difference forms.

Table 4. Panel Unit Root Test Results for Grapes

Variable	*Level – LLC (p)*	*First Difference – LLC (p)*
RC_{GRAPES}	*-3,91 (0,00)**	
EXC_{TR}	*10,467 (1.0)*	*0,10 (0,54)*
EXC_J	*1,81 (0,96)*	*1,36 (0,09)**

*** 99 %; ** 95 %; * 90 %

As demonstrated in Table 4, competitiveness index is stationary on level and competing country's exchange rate is stationary in the first difference form. As expected due to the nature of data, being repetitive for cross sections, exchange rate for Turkey is non-stationary. Following this confirmation, it was tested whether these variables can be estimated via co-integration. Pedroni panel cointegration test was utilised with the hypothesis of 'there is no need for cointegration. Panel ADF (-4,4 with p:0,0) and Group ADF (-5,35 with p:0,00) statistics rejected the hypothesis, enabling co-integrated estimation.

After testing the time dimension of the data, the country dependencies were tested via Hausman and Log-Likelihood tests (Baltagi, 2005), for the deciding on the estimation methodology.

Table 5. Cross-sectional Dependency Test Results for Grapes

H_o: Random Effects estimation is the correct methodology	
Hausman – Correlated Random Effects X^2 (p)	2,08 (0,35)
H_o: Panel estimation is the correct methodology	
Likelihood Ratio – Cross Sectional Dependency F(p)	118,55 (0,00)***

*** 99 %

Depending on the findings, it can be seen that random effects estimation cannot be rejected, while fit of panel estimation was rejected with 99 % significance. Therefore, it can be noted that the appropriate methodology for the

concerned explanatory search was estimating Revealed Competitiveness of Turkey with Random Effects respecting cross sectional diversity. The estimation output for competitiveness in grape exports were indicated in Table 6.

Table 6. Random Effects Estimates of D(RC$_{GRAPES}$)

Variable	Estimate	t- Statistic	p-value
D(EXC$_{TR}$)	-1,59	-7,33	0,063*
D(EXC$_J$)	5.63E-05	1,88	0,00***
Constant	2,32	6,45	0,00***
R^2	0,45	Mean(RC$_{GRAPES}$)	0,19
F(p)	23,37 (0,00)***	Random(cross section) - %	1,061 (0,93)
D-W statistic	1,81	Random errors - %	0,295 (0,07)

*** 99 %; ** 95 %; * 90 %

The regression output seemed to be in conformity with economical expectations on the first sight. The competitiveness of Turkish grape exports rises depending on the valuing competitor country' s currency, while it reduces depending on valuation of Turkish Lira. This is a valid interpretation that, yearly difference in exchange rates addresses the inverse of the sign of estimate. This means, if Turkish Lira devalues against Dollar between years, the competitiveness index rises by 1,59 points. When everything was held constant, the RC index appears as 2,32 for Turkish grapes. Besides, the variation explained was 45 % and parameters were significant altogether. A main indication is the difference between mean of RC$_{GRAPES}$ and the constant estimate of the regression. Subsequently, it was seen that 93 % of the non-explained residuals seemed to stem from cross-sectional variation. Yet, this is a valid situation to interpret the retrievable cross-sectional errors. The cross-sectional errors referring to the countries were indicated in the below figure.
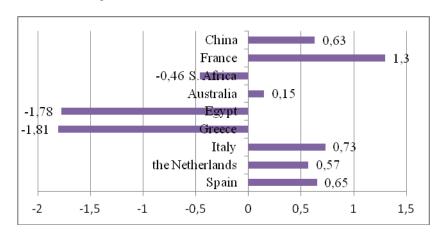

Figure 4. Cross Sectional Errors for Turkish Grape Exports

Considering that 55 % of the estimated relationship was explained by random errors and 93 % of these errors were reflected in cross-country differences, the variation indicated above is worth to diagnose with 51 %. Referring to the RC index, it was understood that Turkey had been superior to all countries except Greece and Egypt. The strongly negative random differentials of these two countries, verifies the computation. Yet, the discrepancy for South Africa is a bit controversial as Turkey used to have advantages over South African grape and raisins trade. The reasoning considered for this case is the continuously devaluing South African Rand since 2011 by almost 100 %. Besides, checking the share of grape exports in South African fruits exports, it can be understood that the country has an improving performance, with its reversed CEP index.

Competitiveness in Cherries Market

Cherries market was considered in the scope of the Mediterranean and European countries due to data availability. Iran appears as a growing competitor. However, trade data for Iran was not adequate for comparison in

time and the superior competitors, Chile and the United States were excluded due to their supremacy. Therefore, prior to calculation and comparison of the indices, the export amount change among the selected countries were demonstrated in Figure 4.
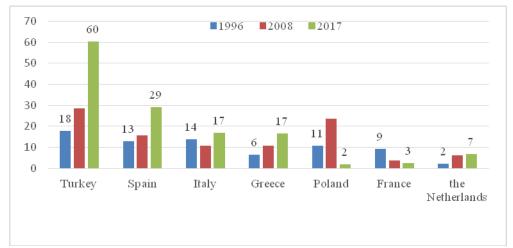

Figure 5. Amount of Exported Fresh Cherries for Turkey and Its Competitors – thousand tonnes (1996-2017)[2]

Considering the amount exported, superiority over the competitors is visible. Specifically, French and Dutch exports seemed to be far less than that of Turkey, with the declining trend demonstrated by France. From 1996 to 2017, Turkish exports had risen by 233 %. Disregarding relative dominance of Turkey, the indices were calculated to understand the comparative advantage and provided in Table 7.

Table 7. Comparative Advantage Indices of Turkish Cherries Exports for Selected Years

RCA - REVEALED COMPARATIVE ADVANTAGE

	Spain	Italy	Greece	Poland	France	the Netherlands
1996	3,89	1,39	1,10	0,87	1,52	5,25
2000	2,96	1,81	1,40	1,11	1,33	2,74
2010	4,47	6,78	1,71	4,06	4,21	6,69
2016	5,69	6,88	1,28	3,98	7,10	7,74

RC - REVEALED COMPETITIVENESS

	Spain	Italy	Greece	Poland	France	the Netherlands
1996	6,05	5,26	2,46	0,00	4,96	7,66
2000	6,90	8,03	5,34	3,37	7,03	8,90
2010	5,81	6,68	3,76	4,55	5,12	6,17
2016	8,32	10,11	5,91	7,73	9,26	9,56

CEP - COMPARATIVE EXPORT PERFORMANCE

	Spain	Italy	Greece	Poland	France	the Netherlands
1996	1,36	0,33	0,09	-0,14	0,42	1,66
2000	1,09	0,59	0,34	0,11	0,29	1,01
2010	1,50	1,91	0,54	1,40	1,44	1,90
2016	1,74	1,93	0,25	1,38	1,96	2,05

As expected, Turkish cherries market is on an advantageous situation for the selected countries. While dominance over Spain, Italy and the Netherlands was significant, the competitiveness seemed to rise for France and Poland during the period. Greece appeared as the most competitive market. With inclusion of imports, there only appeared completely disadvantageous situation in comparison with Poland on 2008. It is important to note that there

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[2] Note: The latest data recorded for France was 1996

had been years that import data was lacking for Turkey and Poland specifically. This cannot be directly related to inexistence of imports, but rather due to missing data.

Considering comparative export performance, Greece and Poland were confirmed as the most competitive markets regarding the conformity of the index. Finally, the relationship of RC with changing bilateral exchange rates was considered for cherries market..

Panel Estimation Results for Cherries Market

Like as the grape market, it needs clarification that this experimental research is based on exchange rate comparisons. Yet, a problematic situation appears for cherries market that all focused countries are members of the European Union. The Euro-Dollar conversion was kept as reference for competing country exchange rate and this leaded simultaneity of both explanatory variables. Considering 2004 and 2016 comparison, the same path was followed for 6 countries.

The Jarque-Bera test results indicated normality of Revealed Competitiveness (0,69 with p:0,7) on the contrary to grapes market. Exchange rate of Turkey (19,94 with p:0,00) and exchange rate of competitive country (8,05 with p:0,02) were non-normal. The correlation between Revealed Competitiveness and exchange rates were high, with 0,39 (0,01) for EXC_{TR} and 0,59 (0,00) for EXC_J based on cross country differences. As expected the correlation between exchange rates is also high with 0,75 (0,00) referring ineligibility of joint use of these rates. The time dependency of variables was again tested and results were indicated below.

Table 8. Panel Unit Root Test Results for Cherries

Variable	Level – LLC (p)	First Difference – LLC (p)
$RC_{CHERRIES}$	0,87 (0,19)	6,81 (0,00)***
EXC_{TR}	13,27 (1,00)	0,52 (0,7)
EXC_J	3,54 (0,99)	-1,49 (0,07)*

*** 99 %; ** 95 %; * 90 %

As Dollar value of Turkish Lira had appeared was non-stationary both on level and first difference, competing country's exchange rate was selected as the only explanatory variable. Again due to non-stationarity of these level variables, existence of a co-integrating relationship was tested with panel Pedroni test. Panel ADF (-3,64 with p:0,0) and Group ADF (-4,48 with p:0,00) statistics confirmed use of co-integrated estimation. Yet, prior to testing the cross sectional dependency, it was first necessary to estimate Panel Least Squares (PGLS). The regression estimates did not provide a sound interpretable output. The PGLS estimates were demonstrated in the below table.

Table 9. PGLS Estimates of $D(RC_{CHERRIES})$

Variable	Estimate	t- Statistic	p-value
Constant	0,39	0,33	0,08*
$D(EXC_J)$	1,34	1,76	0,74
R^2	0,01	Mean($RC_{CHERRIES}$)	0,4
F(p)	0,11 (0,74)	D-W statistic	2,84

* % 90

These regression outputs were almost non-interpretable. The main reasoning is the closeness of mean dependent variable and the only significant estimate, the constant of the regression. There appeared no joint-significance and a strong negative autocorrelation due to Durbin-Watson statistic.

In fact, this explanatory estimation yielded this result as there was no variation in the only explanatory variable, the competing country exchange rate. Accordingly, it is not possible to infer any outcomes from this relation as no non-EU member was not considered as a competitor and non-European competitors as Chile and the USA were significantly dominant traders to be compared. Accordingly, inferences on cherries exports should be kept limited with assessment of the competitiveness indices.

CONCLUSION

Turkey has dominance in production and exports of FFVs. Vegetable exports are more significant, as there are fewer Mediterranean competitors. Turkey also has a strong traditional dried fruits market, and raisins market is an important segment. However, as the data for dried fruits is not comparable due to export superiority of Turkey, it was considered to check the country's situation in fresh and dried fruits markets as a whole. While grape market has

significance traditionally, it was considered as contributory to measure potential changes for cherries market as well. Accordingly, the trade competitiveness of Turkey in grape and cherries were studied in the scope of this paper.

The first intention was to calculate and evaluate trade indices. Due to RCA, Turkey has a good stance both in grapes and cherries. However, the advantage loss was visible for Turkey with respect to its weak rivals as France, China and Spain. Yet, when import capacity was considered as well, RC indicated superiority against the considered rivals other than Greece and Egypt. But the need to improve grape market, both in terms of production, quality and marketing attitudes were visible due to CEP index. Despite providing a relatively good export income, share of grapes in fruit exports was not completely significant for the concerned years.

Due to data conformity, the relationship between the most interpretable index, RC, and bilateral exchange rates were estimated for grapes. 2,32 mean value of RC index referred to the advantageous situation of Turkey. In addition, the results indicated that, devaluation of Turkish Lira or valuation of competing country currency with respect to Dollar leads appreciation of Turkey's export performance in grape market. One reference point devaluation of Turkish Lira inter-periods, leads to 1,59 points rise in competitiveness. However, even if the effect of valuation of competitor country's currency against Dollar provides positive input to Turkey's competitiveness, the effect is negligible. Considering the raisins, with their high value added to producers and exporters, this currency effect was expected. Cross-country differences for the reference period also confirmed the evaluation of RC index after decomposition of the error term. Turkey's RC index has been in declination for Greece, Egypt and growing South African grape sectors. South Africa has joined in the grape market competition lately. However, due to its rising demand from European countries and devaluing South African national currency, the lower competitiveness of Turkey can be expected.

Following, grape and raisins market, the same assessment was made for cherries market. Apparently, sweet and sour cherries constitute a growing market for Turkey with respect to rising demand. Especially increasing demand from the European countries, the national market and its export contracts has been growing. In order to enable a scale-valid comparison, the superior countries, Chile and the USA, were excluded from the analysis. After this exclusion, rising potential of Turkish cherries market became visible. In contrast to declining RCA of grape market, RCA for cherries has been increasing. Among the European competitors, the most advantageous competitor had appeared as Greece. This situation was confirmed with consideration of imports and share of cherries in fruits exports. So, RCA, RC and CEP indices were rising within the time. Yet, the analytical findings for cherries did not set forward interpretable outcomes. This is due to the fact that the econometric assessment relied on an experimental research of revealed competitiveness and altering bilateral exchange rates. Within the panel structure, Turkish Lira per Dollar is repetitive with respect to considered six countries. In addition, when the European membership situation of existing strong competitors was considered, the variation in rivals' exchange rates had died as well. Accordingly, it was decided not to interpret the lacking estimation output.

With reference to these findings, it is possible to infer that the agricultural policy makers and implementers in Turkey should focus on extending market lines for traditional grape and raisins exports. Even if the available strong competitors did not change or grow significantly, the high value added niche exports should be maintained and developed further. Recent devaluation of Turkish Lira can be used to extend market potential, referring to the conventional trade knowledge. This devaluation may contribute in rise in exports, which may cover the potential rise in costs and unit prices. As an alternative and growing market, cherries market should be considered more. Due to the rising demand and changing fruit preferences of Europe, it is possible to enter in new markets and grow more. Even if we failed to prove inverse relationship between the exchange rate and export competitiveness, new research extending the competitor orientation and including more variables would lead us to estimate future of cherries market as well as the grape market.

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