Measuring the Competitiveness of Saudi Arabia's Fruit Date Exports

Sattam Almodarra

PhD Student, Department of Agricultural Economics
University of Kentucky
338 Charles E. Barnhart Building
Lexington, KY 40546-0276
E-mail: s.almodarra@uky.edu

and

Sayed Saghaian

Associate Professor, Department of Agricultural Economics
University of Kentucky
314 Charles E. Barnhart Building
Lexington, KY 40546-0276
E-mail: ssaghaian@uky.edu

Selected Paper prepared for presentation at the Southern Agricultural Economics Association's 2016 Annual Meeting, San Antonio, Texas, February 6-9, 2016

Copyright 2015 by Sattam Almodarra and Sayed Saghaian. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Measuring the Competitiveness of Saudi Arabia's Fruit Date Exports

Abstract

This study is to measure competitiveness and its effect on the quantity of Saudi exports of dates in the international market between 1990- 2011. In order to measure the competitiveness of date exports, the study depended on a number of indexes such as the revealed comparative advantage and the competitive advantage. The study also depended on the analysis of simple regression to study the relationship between the Saudi exports of dates and the competitiveness indexes during the study period. This study showed that the United Arab Emirates (UAE) is the main market for Saudi exports of dates, as it imported about 61.2%, followed by the United Kingdom (UK) at 12.8%, then Syria, Jordan, Kuwait, Sri Lanka, and Qatar at 3.8%, 1.5%, 1.4%, 1.1% and 1.1%, respectively between 2000 and 2011. The average of the revealed comparative advantage and the competitive advantage for Saudi exports of dates is 49.27 and 55.25 respectively. The Kingdom of Saudi Arabia is distinguished with the revealed comparative advantage and the competitive advantage for date exports between 1990 and 2011. The study showed that there is an increase by 10% in the competitive advantage for the exports of Saudi dates, resulting in an increase in Saudi exports of the same good by 10.37%. The study recommends the importance of increasing the competitiveness of Saudi exports of dates in the international market through technological advances used in packaging and storage. Additionally, the study recommends creating a new market for Saudi exports of dates by assigning commercial representation to prepare studies of external demands on date exports, and provide information about foreign consumer tastes to exporters. Commercial representation will also provide Saudi Arabia information about the quantity and type of dates that foreign consumers need, as well as the export prices of competitive countries in the international market.

Keywords: dates, competitiveness, exports, international market**.**

Introduction

The kingdom of Saudi Arabia is considered one of the most important countries that produce dates worldwide. Saudi Arabia's production averages 944 thousand tons, approximately 13.7% of the world's average date production of 6.9147 million tons in 2011. Despite their economic importance, only 4.63% of Saudi's dates are exported. Saudi accounts for 7 % of the world date exports from 2000 to 2011 (Food and Agriculture organization (FAO)). The quantity of Saudi exports of dates has increased from 28.3 thousand tons (valued at 18.3 million dollars) in 2000, to 51.1 thousand tons (valued at 32.5 million dollars) in 2005. The quantity decreased to 1.6 thousand tons (valued at 1.7 million dollars) in 2009. It increased to 77.8 thousand tons (valued at 86.3 million dollars) in 2011 (FAO). Saudi's efficient export operations, ability to gain marketing information and compliance with international standards makes the quantity and value of its date exports noteworthy in an unstable international market.

Export competitiveness is an important issue that concerns developing countries for globalization and global trade liberalization. Thus, the developing countries are in need of increasing competitiveness in agriculture and total exports. The ability of local establishments to compete against foreign ones depends on many aspects, but the most important aspects are: The average cost of a produced unit, production rates, the ability of local products to penetrate foreign markets, and marketing quality. According to Qamra (2013), international competitiveness is an everlasting dynamic process, so it requires a certain amount of long-term investment in order to apply technological methods effectively. This study measures competitiveness and its effect on Saudi date exports and recommends increasing competitiveness in the international market by achieving the following objectives:

1. Measuring the most important competitive indexes for date exports between 1990 and 2011.

2. Studying the economic relations between competitiveness and the quantity of Saudi date exports during the aforementioned period.

3. Recommending increasing the competitiveness of Saudi date exports in the international market.

Research Questions

The study raises the following two questions:

1. Are Saudi exports distinguished by their competitiveness in the international market?

2. How can we increase competitiveness of Saudi date exports in the international market?

Study Methodology

In order to calculate the relevant indicators, I used data on Saudi Arabia's production and exports (FAOSTAT, 2015) as well as the major exporters of dates in relation to the total world trade between 1990 and 2011. To measure the competitiveness of Saudi Arabia's date exports, the study depended on many important indexes such as:

1. **Revealed Comparative Advantage:** This index reflects the economic effectiveness of real materials as identified by the Balassa index. The Revealed Comparative Advantage divides a certain country's exports of a specific good by the total international exports of that good. This index uses the following formula (Porter, 1990; Lall, 2001):

$$\mathbf{RCA = (X_{ik} / X_{it}) / (X_{wk} / X_{wt})}$$

Whereas:

X_{ik}: The represent the export of product (k) country (i)
X_{it}: The represent the total exports in country (i)
X_{wk}: The represent the total world exports of product (k)
X_{wt}: The represent Total world exports.

When the index ratio is greater than one, this means that the country has a comparative advantage for this exported good. When the index ratio is less than one, the country is at a comparative disadvantage. This index depends only on export data, as these exports will be the true test for a country's competitiveness in local industries. Moreover, the growth of developed countries' exports is closely related to the improvement of their living standards.

2. Relative Competitive Advantage: this index depends on data for the value of product exports and the value of total exports for both the country and the world. This index uses the following formula (Bukley et al., 1988):

$$\mathbf{RXA = (X_{ia} / X_{in}) / (X_{ra} / X_{rn})}$$

Whereas:
X_{ia}: The country's (i) total export of the product (a)
X_{in}: The country's (i) total export of all products except the product (a)
X_{ra}: The world total export of the product (a) except the country's (r) total export
X_{rn}: The world total export of all products except the country's (r) export of the product (a)

When the index is greater than one, this means that the country's industry has a competitive advantage against other countries. If the index is lower than one, the country's industry is at a competitive disadvantage.

This study also depended on the analysis of linear regression in order to study the economic relationship between the quantity of Saudi exports and the competitive indexes between 1990 and 2011. The linear regression evaluated the forms by Ordinary Least Square (OLS).

Literature Review

In one study entitled "Saudi Dates Exports Demand in Selected Markets", external elasticities were estimated for dates exported from Saudi Arabia to selected countries between 2001 and 2011. In Germany, India, USA, and Pakistan it is not possible to increase Saudi Arabian date prices because the price elasticity of demand was more than one. In every country studied except India and Jordan, it may be possible to increase exports in the short run (Ali et. al., 2014). In another study, "A study on the Export of Saudi Arabian Dates in the Global Markets," researchers focus on the date of importing and exporting global market. The importing countries were organized into five groups based on their geographical location and cultures, and the same criteria were used to separate date exporting countries into three groups. The average price of dates was calculated for each group, and this was compared to the placement of Saudi Arabian dates in the global market. Recommendations were made for improving Saudi Arabian date exports to each group (Al-Shreed et. al., 2012). This study is similar in subject to "Analysis of Export Demand for United Arab Emirates' Dates in World Markets," where foreign demand of UAE dates were investigated for the countries of India, Malaysia, Pakistan, Indonesia, Sri Lanka, and Jordan. Date exports were recommended to be increased to the Indian, Sri Lankan,

Indonesian, Pakistani and Jordanian markets (Elashry et. al., 2010). In an analytical study "The Competitiveness of the Saudi Arabian Date Palm: An Analytical Study," researchers found a surplus of 400,000 tons of dates in 2010 and an expected surplus of 600,000 tons by 2022. This surplus is the result of excess production of low consumption and of weak processing and exportation of KSA dates. The average price of exports has reached 1065 US$/ton; the low price is blamed on the production of low-quality varieties of dates. With 14.1% of the world's date production, the Kingdom is the second largest producer of dates, but its exports remain low, indicated by only 6.8% of production being marketed externally (El-Habba and Al- Mulhim, 2013). Moreover, in a focused study of the Saudi dates entitled "An Economic Study of Processing Problems for the Main Important Varieties of Dates in Saudi Arabia," it was revealed that all general economic indicators increased in regards to date production in Saudi Arabia, but there remain multiple problems with production. These problems include low quality of some varieties, marketing standards inefficiencies, regulations and marketing deterioration. Possible solutions are given in Elsabea's 2012 study. The geographical distribution of Saudi date exports was examined in "Optimizing Geographical Distribution for Saudi Arabia Exports of Date Palm." For the years 1997-2011, export trends in quantity, unit value and total value of date exports was estimated, and all three quantities showed an increase during the studied period (Muhsen and Al-Muhin, 2014).

Some economic studies have dealt with Saudi's competitiveness in exports of dates in the international market. Alhemdan (2004) showed that the obstacles related to the marketing and exporting of Saudi dates is caused by a non-commitment to date standards adopted by the Saudi Arabian standards organization. The study recommended following food and health regulations related to dates such as Good Agricultural Practices (GAP), Good Manufacturing Practices

(GMP), and Hazard Analysis and Critical Control Points (HACCP). In addition, the Ministry of Agriculture at Saudi Arabia's study (2007) (taken in Saudi Arabia) analyzed the size of the market of date exports in some international markets such as Germany, India, and France. The study showed that the most important competitors in the Germany market are Tunisia, Iran, Israel, France, Turkey, Algeria, and Pakistan, and the most important competitors in the Indian market are Iran, Pakistan, UAE, and Oman.

Interestingly, several studies have focused on similar export patterns and analysis as is being studied in this paper. The study in "Revealed Comparative Advantage and Competitiveness: A Case Study for India in Horticultural Products" revealed that India has a high comparative advantage in the North American and EU markets in the vegetable and fruit markets, but not in the flower market (Bhattacharyya, 2011). Moreover, Ahmed and El-Shehawy (2011) analyzed the export structure and competitiveness of Chinese apple exports for the years 2000-2009 and compared China to major apple exporters including Chile, France, Italy, Poland, and the USA. Russia is the main importer and some expansion has occurred into South East Asia. Additionally, in "Competitiveness and Determinants of Cocoa Export from Nigeria" researchers analyzed Nigerian cocoa exports for the years 1990-2005 and found that Nigeria does have a comparative advantage in cocoa exportation (Nwachukwu and Agwu, 2010). Furthermore, in "Export Competitiveness of Pakistani Horticultural Products" the authors analyzed Pakistan's export competitiveness of select horticultural products and found that Pakistan has comparative and competitive advantage over the period studied. Prior to this, Pakistan transitioned from a period of comparative disadvantage to advantage (Akhtar and Akmal, 2013). Lastly, Lakkakula and Dixon (2015) reveal that Vietnam is a growing world rice exporter and is providing competition

to Thai rice exports. They used a shift-share analytical framework to analyze global rice trade competitiveness.

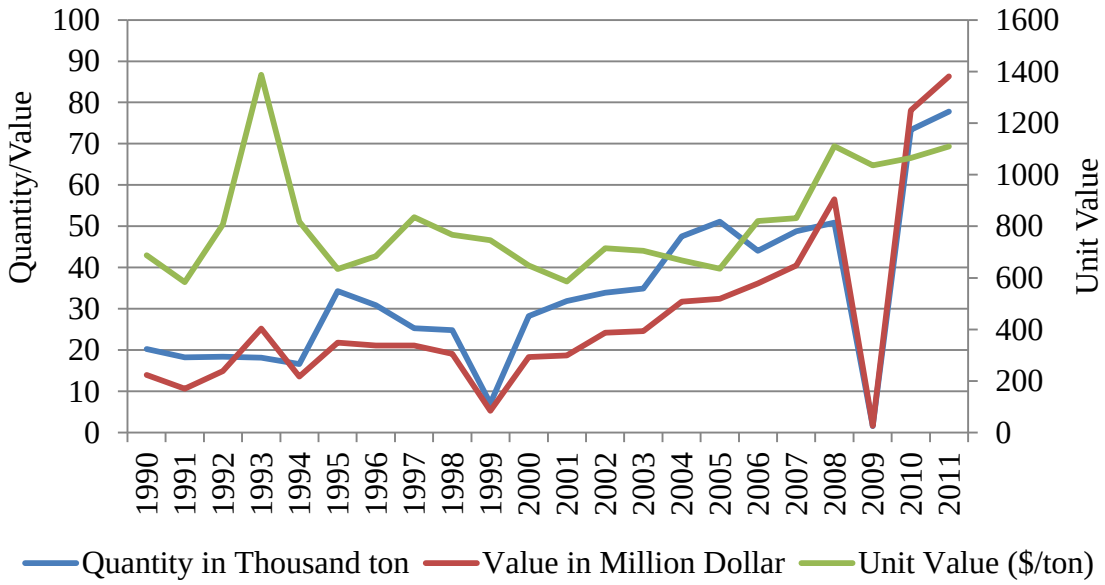
Results and Discussion

The results of this study highlight three important elements, each will be discussed in details as follow: The Saudi Arabia exports of dates, the competitiveness of Saudi exports of dates, and the effect of competitiveness on the quantity of Saudi exports of dates.

Saudi Arabia Exports of Dates

The study of quantity and value in Saudi dates from 1999 to 2011 shown in figure and table 1 clarified that the quantity of date exports ranged between a minimum of 1.59 thousand tons (approximately 1.65 million dollars) in 2009 to a maximum of 77.8 thousand tons estimated (approximately 86.29 million dollars)in 2011. The average export rate ranged between a minimum limit of 584 dollars / ton in 1991 to a maximum limit of 1.39 thousand dollars/ ton in 1993 with an annual average of 812.82 dollars/ ton. Value of date exports are increased annually by an estimated 812.82 dollars. The quantity and value of date exports have increased annually by 5.81% to 7.69% respectively. Date export prices have increased by an average of 1.25% annually.

Figure 1. The Quantity and Value of Saudi exports of dates during 1990- 2011



Source: FAO

Table 1. General trend equations for the value and quantity of Saudi date exports between 1990- 2011

Items	Annual growth rate %	F	R^2	Equation
Export quantity	**5.81**	**15.39**	**0.43**	$\hat{Y} = 11.118+1.951\ T$ $(1.70)\ \ (3.92)^{**}$
Export value	**7.69**	**15.26**	**0.43**	$\hat{Y}=3.231+2.154\ T$ $(0.45)\ \ \ (3.91)^{**}$
Average of export rate	**1.25**	**4.22**	**0.31**	$\hat{Y}=932.16-48.74\ T+2.56\ T^2$ $(7.34)^{**}\ \ (-1.93)^{*}\ (2.38)^{*}$

** indicates significant at probability 1%, * indicates significant at probability 5%.

Source: FAO

Saudi Arabia exports of dates the International market; it was estimated in 78 countries between 2000 and 2011. After the study of geographical distribution of the quantity and value of Saudi

date exports, the data in the below mentioned table 2 shows that the UAE is in the first rank to import Saudi dates. The UAE imported about 26.72 thousand tons of Saudi's dates (61.2 % of the total average of Saudi date exports of 43.67 thousand tons) in 2000- 2011. The UK came in second place for importation of Saudi dates at 12.8% followed by Syria, Jordon, Kuwait, Sri Lanka, and Qatar at 3.8%, 1.5%, 1.4%, 1.1% and 1.1%, respectively. It was obvious that the abovementioned markets have absorbed about 82.9% of Saudi date exports; however, the relative importance of absorption of other markets is not more than 17.1%. There is also a great difference in the average price of dates between importing countries, with the minimum rate estimated at 352.4 dollars / ton for Kenya and the maximum rate estimated at 1985.4 dollars/ ton for Turkey.

Table 2. The value and quantity of Saudi date exports by geographical distribution between 1990- 2011

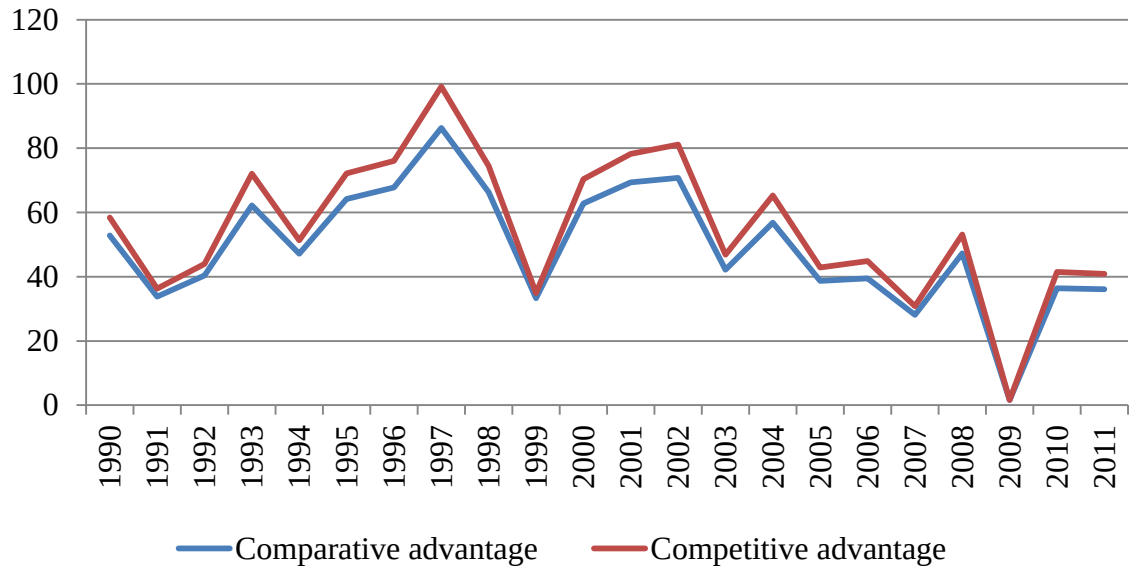
Country	Export Quantity in ton	Relative importance %	Value of Exports in ,000 Dollar	Relative Importance %	Average Export price $ / Ton
United Arab Emirates	26716.1	61.2	23288.0	62.2	871.7
United Kingdom	5593.0	12.8	2931.6	7.8	524.2
Syria	1639.0	3.8	1774.4	4.7	1082.6
Jordan	666.3	1.5	636.3	1.7	955.0
Kuwait	621.5	1.4	759.4	2.0	1221.9
Sri Lanka	499.3	1.1	245.8	0.7	492.2
Qatar	461.8	1.1	542.3	1.4	1174.3
Sudan	331.6	0.8	120.6	0.3	363.7
Somalia	324.2	0.7	198.0	0.5	610.8
Djibouti	304.8	0.7	149.8	0.4	491.3
Pakistan	238.8	0.5	117.8	0.3	493.4
Lebanon	185.0	0.4	199.7	0.5	1079.3
Kenya	170.8	0.4	60.2	0.2	352.4
India	170.5	0.4	72.8	0.2	426.7
Bahrain	114.2	0.3	76.4	0.2	669.4
Turkey	107.8	0.2	213.9	0.6	1985.4
Other countries	5526.4	12.7	6057.9	16.2	1096.2
Total	**43671.1**	**100**	**37444.9**	**100**	**857.4**

Source: FAO

The Competitiveness of Saudi Exports of Dates

The indices for the competitiveness of Saudi date exports between 1990- 2011 in figure 2 show that the comparative advantages indicator for Saudi exports ranged between a minimum of 1.62 in 2009 and a maximum of 86.26 in 1997 with an annual average of 49.27. The value of the comparative advantages indicator and the competitive advantage for Saudi exports of dates has increased by one, so the Kingdom of Saudi Arabia is distinguished by a relative comparative advantage and a competitive advantage for date exports in 1990 – 2011. The market share of Saudi date exports compared to the value of international exports for the same good, ranges between a minimum of 0.3% in 2009 and a maximum of 10.44% in 2004, with an annual average of 6.92% in 1990 – 2011. The study of competitiveness indicators for Saudi exports of dates shown in table 3 demonstrates a decrease in the comparative advantage and the competitive advantage of date exports by 2.42% and 2.52% respectively.

Figure 2. Competitiveness indices for Saudi date exports between 1990- 2011.



Source: FAO

Table 3. General trend equations for the most important indices for competiveness for Saudi exports during 1990- 2011

Items	Annual growth rate %	F	R^2	Equation
Comparative advantages	**-2.42**	**6.96**	**0.42**	$\hat{Y}= 40.23+4.56\ T-0.25\ T^2$ $(3.82)^{**}\ (2.16)^{*}\ (-2.83)^{**}$
Competitive advantage	**-2.52**	**6.21**	**0.40**	$\hat{Y}= 44.17+5.28\ T-0.29\ T^2$ $(3.53)^{**}\ (2.11)^{*}\ (-2.72)^{**}$
Market share	**1.49**	**1.60**	**0.07**	$\hat{Y}= 5.734+ 0.103\ T$ $(5.37)^{**}\ (1.26)$

** indicates significant at probability 1%, * indicates significant at probability 5%.

Source: FAO

The Effect of Competitiveness on the Quantity of Saudi Exports of Dates

In order to study the effect of competitiveness on the quantity of Saudi date exports between 1990- 2011, a correlation matrix has been conducted between used variables. According to the data in table 4, this matrix showed that simple correlation factors between the comparative advantage and competitiveness of Saudi's dates reached 0.99. Consequently, the availability of the comparative advantages and the competitiveness in an estimated form will eventually result in the appearance of multiple linear relations that affect the significance of regression coefficients in the estimated form. In order to avoid the problem of multiple linear relations, the comparative advantage variable has been excluded.

Table 4. Correlation matrix between the variables

Variables	Export quantity LnY	Comparative advantage LnX_1	Competitive advantage LnX_2
LnY	1.00		
LnX_1	0.67	1.00	
LnX_2	0.68	0.99	1.00

Source: FAO

In this study, I measure the economic relations between Saudi exports of dates and the competiveness index (X2) for the same good during 1990- 2011 using Ordinary least-squares (OLS) regression, double logarithmic form, and semi logarithmic form. I show the importance of using double logarithmic forms to represent the data in estimating the following equation:

$$\ln\hat{Y} = 0.612 + 0.695 \ln X2$$

$$(0.93) \quad (4.16)^{**}$$

$$R^2 = 0.46 \quad F = 17.34 \quad D.W = 0.77$$

I used Durbin-Watson statistic to check for the presence of autocorrelation. From the above equation we see that Durbin-Watson (D-W) has a value of 0.77, which is less than the minimum limit of the Durbin-Watson table value. The above positive serial correlation causes the F-statistics to be inflated and underestimate the true standard errors. This results in inaccuracy of estimated results and statistical tests for the model. The equation below solves the self-correlation problems.

The estimated form can be expressed using the following equation:

$$\ln\hat{Y} = 0.036 + 1.037 \ln X_2 + 0.897\, ar$$

$$(0.03) \qquad (12.69)^{**} \qquad (6.42)^{**}$$

$$R^2 = 0.81 \qquad F = 37.75 \qquad D.W = 2.52 \qquad LM\ test = 1.23$$

From the above results, it shows that for every 1% increase in the competitive advantage for dates (X2), the quantity of Saudi exports will increase by 10.37 %. The R-squared value for the above equation is 0.81, which indicates that 81 percent of the variation in the Saudi exports of dates during the given time period and is explained by the competitive advantage. Residual of the model is estimated at 19% for other variables not captured in the given equation. The Breusch-GodFrey serial correlation LM test gives (which refers to the Lagrange Multiplier Test of Residual) the calculated F test value of 1.23. This value is not significant at 10 percent value and fail to reject the null hypothesis of no serial correlation. This concludes that results from the above equation are valid.

Conclusion, Implications and Recommendations

Results conclude that the competitive advantage for dates plays a vital and significant role for the Saudi exports. From this, I recommend increasing competitiveness for Saudi exports of dates in the international market through improving technological used in packaging and storage. Additionally, I recommend creating a new market for Saudi exports of dates by assigning commercial representation to prepare studies of external demands on date exports and provide information about foreign consumer tastes for exporters. Commercial representation will also provide Saudi Arabia information about the quantity and type of dates that foreign consumers need as well as the export prices of competitive countries in the international market.

Reference

1. Ahmed, Rania A., and Mohamed A. El-Shehawy. "The Structure and Competitiveness of China's Apple Exports." *World Journal of Agricultural Sciences* 7.6 (2011): 678-83. Print.

2. Akhtar, Waqar, and Nadeem Akmal. "Export Competitiveness of Pakistani Horticultural Products." *Pakistan J. Agric. Res* 26.2 (2013): 87-96. Print.

3. Alhemdan Abdullah, "for date manufacturing and how to use its wastes, the third meeting for agriculture marketing: marketing of Saudi dates". *Industrial commercial chamber in Riyadh* (2004).

4. Ali, Abdel, Al-Mulhim Fahad, and Mohammad Samir. "Saudi Dates Exports Demand in Selected Markets". *International Journal of Agriculture and Crop Sciences* 7.11 (2014): 827-32. Print.

5. Al-Shreed, F., and M. Al-Jamal. "A Study on the Export of Saudi Arabian Dates in the Global Markets." *Journal of Development and Agricultural Economics* 4.9 (2012): 268-74. Print.

6. Bhattacharyya, Ruma. "Revealed Comparative Advantage and Competitiveness: A Case Study for India in Horticultural Products." *International Conference On Applied Economics* (2011): 21-28. Print.

7. Buckley, Peter J., and Christopher L. Pass. "Measures of International Competitiveness: A Critical Survey." *Journal of Marketing Management* 4.2 (1988): 175-200. Print.

8. El-Ashry, Mohamed K., Mohamed S. GHEBLAWI and Sherin A. SHERIF, 2010. Analysis of export demand for United Arab Emirates' dates in world markets. Bulg. J.Agric. Sci.,16: 123-134.

9. El-Habba, Mohammad Samir, and Fahad Al - Mulhim. "The Competitiveness of the Saudi Arabian Date Palm: An Analytical Study." *African Journal of Agricultural Research* 8.43 (2013): 5260-267. Print.

10. Elsabea, Alaa M.R. "An Economic Study of Processing Problems for the Main Important Varieties of Dates in Saudi Arabia." *Annals of Agricultural Sciences* 57.2 (2012): 153-59. Print.

11. Food and Agriculture Organization of the United Nations (FAO), (2015).

12. Lakkakula, Prithviraj, and Bruce L. Dixon. "Global Rice Trade Competitiveness: A Shift-share Analysis." *Agricultural Economics* 46 (2015): 1-10. Print.

13. Lall, Sanjaya. "Competitiveness Indices and Developing Countries: An Economic Evaluation of the Global Competitiveness Report." *World Development* 29.9 (2001): 1501-525. Print.

14. Ministry of agriculture, "undersecretary of research affairs and development, studies, planning, and statistics management", dates in the Kingdom of Saudi Arabia facts and hopes. (2007)

15. Muhsen, A.A., and F. Al-Muhim. "Optimizing Geographical Distribution for Saudi Arabia Exports of Date Palm." *Bulgarian Journal of Agricultural Science* 20.4 (2014): 754-60. Print.

16. Nwachukwu, Ifeanyi Ndubuto, and Nnanna Agwu. "Competitiveness and Determinants of Cocoa Export from Nigeria." *Report and Opinion* 2.7 (2010). Print.

17. Porter, M. (1990). The Competitive Advantage of Nation. Harvard Business Review, March-April, pp. 73-93.

18. Qamrah, Sahar Abdul Monem, "the estimation of targeted level and competitiveness for Egyptian orange exports in international markets" *Saudi society for food and nutrition Journal*, faculty of food sciences and agriculture, King Saud University (2013), eight volume, first and second edition (Moharam, Ragab), P 21- 45.