ECONOMIC ANALYSIS OF INDICATORS OF THE COMPETITIVENESS OF SAUDI DATE EXPORTS

Khalid Nahar Alrwis
College of food and Agricultural Sciences, King Saud University, Saudi Arabia
E-mail: knahar@ksu.edu.sa

Abdalzziz M. Duwais
College of food and Agricultural Sciences, King Saud University, Saudi Arabia
E-mail: aduwais@ksu.edu.sa

Sharafeldin bakri Alaagib
College of food and Agricultural Sciences, King Saud University, Saudi Arabia
E-mail: salaagib@ksu.edu.sa

Nageeb Aldawdahi
College of food and Agricultural Sciences, King Saud University, Saudi Arabia
E-mail: naldawdahi@ksu.edu.sa

ABSTRACT

This study analysed the competitiveness indicators of Saudi exports of dates using econometric analysis and competitiveness indicators. The Republic of Yemen was found to rank first in importing Saudi dates, followed by the United Arab Emirates, then by Turkey, Kuwait, Jordan, Somalia, Lebanon and Qatar. A clear discrepancy existed in the average export prices of Saudi dates between the various importing countries, where the average export price ranged between a minimum of $559.9/tonne; Syria had an upper limit of $4,368.2/tonne for South Africa. The Kingdom of Saudi Arabia enjoyed a competitive advantage in exporting dates to South Africa, followed by the Emirates, Pakistan, Jordan, Djibouti, Turkey and Syria. The geographical concentration coefficient for each of the quantity and value of Saudi exports of dates was approximately 0.40 and 0.37 for each during 1990–2018. A 10% change in the competitiveness of Saudi dates, expressed in the rate of the actual performance of the foreign date trade, led to a change in the same direction of the quantity of Saudi exports of dates by 3.8%. The study recommends increasing the competitiveness of dates in international markets and preserving markets where in the Kingdom enjoys a competitive capacity for its agricultural exports.

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1. INTRODUCTION

Foreign trade plays an important role in securing the basic needs of citizens and the requirements of production and disposal of products for various sectors. It also includes a wide movement of individuals, capital, technical and administrative expertise and the provision of foreign currencies; therefore, it integrates international markets, grows economic sectors and facilitates development.

Trade in agricultural and food commodities is also one of the most important means of meeting demand and providing food security for citizens. Dates have a special place in the Saudi agricultural economic structure at the level of production, consumption and marketing. Therefore, the state has supported this productive activity to increase production while improving quality.

The cultivation of dates is concentrated in four regions: Riyadh, Qassim, Sharkia and Hail. The Kingdom of Saudi Arabia exports dates; thus, by monitoring the quantity and value of Saudi date exports in the 1990–2018 period, fluctuations in the quantity and value of Saudi date exports can be observed. This has led to instability in the quantity and value of food exports in international markets. Owing to the great competition from producing and exporting countries, which enjoy efficiency in export operations, it also enables them to obtain market information and determine the extent of their commitment to international standards.

1.1. Research objectives

This study aims to measure the impact of competitiveness on Saudi date exports during the 1990–2018 periods and to achieve the following sub-goals:

a) Study the current status of Saudi exports of dates.

b) Measure the competitiveness indicators of Saudi date exports in international markets.

c) Study the impact of competitiveness on Saudi date exports during the 1990–2018 periods.

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2. MATRIAL AND METHODS

In achieving its objectives, this study relied on econometric analysis to analyze the economic factors that determine the quantity of Saudi date exports as well as its indicators of competitiveness, the most important of which are as follows.

2.1. Market Penetration Ratio (MPR)

The market penetration rate is the ratio between the country's exports of a commodity and its apparent consumption in the importing country. It is estimated for the most important importing markets for Saudi dates in terms of absorptive capacity. The market penetration rate is an important indicator to measure the competitiveness of any country and is calculated using the following equation (Oral & Chabchoub, 1997):

$$MPR_{ij} = \frac{EX_{ij}}{Q_{ij} + M_{ij} - X_{ij}}$$

where

MPR_{ij} = the country's penetration rate of the most important market for commodity j;

MPR_{ij}
EX_{ij} = the exporting country's exports of commodity j;

EX_{ij}
Q_{ij} = the importing country's production of commodity j;

EX_{ij}
M_{ij} = the country's imports of commodity j and

EX_{ij}
X_{ij} = the exports country's import of commodity j.

2.2. Gini Hirschman Coefficient
X_{ij}

The pattern of geographical concentration is measured using the concentration factor or the Gini Hirschman coefficient, which can be expressed by the following equation:

$$C_{ix} = 100 \sqrt{\frac{\sum (X^2_{is})}{\sum (X_j)^2}} \qquad\qquad (1)$$

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Where C_{ix} represents the geographic concentration coefficient; X_{is} represents the quantity and value of exports destined for a specific country or the quantity and value of imports from a particular country and X_j represents the total quantity and value of exports and imports.

The value of the geographic concentration coefficient lies between zero and one; the closer the value of this indicator is from one, the more it indicates that exports and imports are distributed over a small number of international markets. If the value of this index is closer to zero, it indicates the expansion of international markets (Ghanem, 1998).

2.3. The Revealed Comparative Advantage index.

This indicator, known as the Balassa Index, reflects the economic efficiency of real resources. The revealed comparative advantage index measures the relative importance of a country's exports of a particular commodity in its export structure relative to total global exports. The revealed comparative advantage can be expressed in the following equation (Porter, 1990; Lall, 2001):

$$RCA_j = \left[\left(\frac{X_{ik}}{X_{it}} \right) \div \left(\frac{X_{wk}}{X_{wt}} \right) \right] \qquad (2)$$

where RCA_j is the apparent comparative advantage of a country's exports of a particular agricultural commodity; X_{ik} is the value of a country's exports of agricultural commodity k; X_{it} is the total value of a country's agricultural exports; X_{wk} is the global export value of agricultural good k and X_{wt} is the total value of world agricultural exports.

2.4. Market Share

The market share is the percentage of the exports of the commodity exporting country out of the total imports of the country importing that commodity (Bediwi, 2012).

2.5. Actual Performance Index of Foreign Trade or the Vallrath Index

This indicator is based on the value of both exports and imports. The actual performance index of foreign trade is calculated as the difference between the competitive advantage of exports and the competitive advantage of imports. It is expressed in the following equation (Buckley et al. 1988):

$$RCA = RXA - RMA \qquad (3)$$

$$RXA = (X_{ia} \div X_{in})/(X_{ra} \div X_{rn}) \qquad (4)$$

$$RMA = (M_{ia} \div M_{in})/(M_{ra} \div M_{rn}) \qquad (5)$$

where RXA is the competitive advantage of exports; RMA is the competitive advantage of imports; X_{ia} represents the country's exports of the commodity; X_{in} is the country's total exports of the commodity minus the exports of the commodity; X_{ra} is the country's total exports of the commodity minus the exports of the commodity; X_{rn} represents total world exports minus the country's exports of the commodity; M_{ia} represents the country's imports of the commodity; M_{in} represents the country's total imports minus the commodity's imports; M_{ra} is the world imports of the commodity minus country imports and M_{rn} represents the total world imports minus the country's imports of the good.

A positive value of this indicator indicates achieving the country's competitive advantage. This study also relied on multiple regression analysis of the specific economic variables for the quantity of Saudi date exports during the 1990–2018 period. The model used is expressed by the following equation:

$$LnY = a_0 + b_1LnX_1 + b_2LnX_2 + b_3LnX_3 + b_4LnX_4 + e_t \quad (6)$$

Where Y represents the amount of Saudi exports of dates in tonnes; X_1 is the export price is in thousand dollars/tonne; X_2 is competitiveness; X_3 is domestic production in tonnes and X_4 is Saudi consumption of dates in tonnes.

The indicated model was estimated using the ordinary least squares method. The autocorrelation problem was also detected using two tests, the Breusch–Godfrey serial correlation LM Test and the Arch Test (Kirchgassner & Wolters 2012).

3. RESULTS AND DISCUSSION

3.1. The Current Status of Saudi Date Exports

By studying the development of the quantity and value of Saudi date exports during the 1990–2018 period, it is evident from the data in Table *1* and 2 that the amount of Saudi exports of dates ranged between a minimum of 7.100 thousand tonnes in 1999 and a maximum of 161.94 thousand tonnes in 2018, with an annual average of 56.9 thousand tonnes. The value of Saudi exports of dates ranged between a minimum of $5.3 million in 1999 and a high of $201.39 million in 2018, with an annual average of $56.5 million.

There is a discrepancy between the minimum and the upper limits of the quantity and value of date exports, as the ratio of the difference between the upper and lower limits to the

annual average was 272.06% and 346.9%, respectively. From the foregoing, it is clear that the average export price ranged between a minimum of $584.01/tonne in 1991 and a higher limit of $ 1387.33/tonne in 1993, with an annual average of $878.48/tonne.

There is also a discrepancy between the minimum and the upper limit of the average export price of dates, as the ratio of the difference between the minimum and the highest to the annual average reached 91.4% during the study period. The annual growth rate for the quantity and value of Saudi date exports was estimated at 3.5% and 4.4%, respectively, during the 1990–2018 period.

The ratio of the value of date exports to the value of agricultural exports ranged between a minimum of 1.9% in 2007 and a high of 6.34% in 2018, with an annual average of 3.58%. There is a discrepancy between the minimum and the upper limits of the ratio of the value of date exports to the value of agricultural exports, as the ratio of the difference between the upper and lower limits to the average was 4.4%.

The quantity and value of Saudi date exports were characterised by instability, as the coefficient of variation, as an indicator of instability, was about 76.5% and 98.2%, respectively, during the 1990–2018 period. The ratio of the value of Saudi date exports to the value of agricultural exports was also characterised by instability, with the coefficient of variation reaching about 33.1% during the same period.

Table 1: Statistical analysis of the quantity and value of Saudi date exports during the 1990–2018 period.

Statement	The quantity of exports in tonnes	The value of exports in thousands of dollars	The export price in dollars per tonne ($)	The relative importance of the value of dates exports to agricultural exports (%)
Average	56913.38	56521.97	878.48	3.58
Minimum	7100	5300	584.01	1.90
Maximum	161941	201393	1387.33	6.34
The difference between the maximum and minimum	154841	196093	803.32	4.44
The ratio of the difference between the two limits to the mean	272.06	346.93	91.44	124.23
Standard deviation	43539.23	55524.61	229.89	1.19
Coefficient of variation%	76.50	98.24	26.17	33.13

Source: Compiled and calculated from World Food and Agriculture Organisation database for the 1990–2018 period.

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Table 2:The general time trend equations for the development of the quantity and value of Saudi exports of dates during the 1990–2018 period.

Statement	Annual growth rate%	F	R^2	Equation
The quantity of dates exports	3.5	123.88	0.821	$LnY = 4.103 + 0.0355T$ (74.823)** (11.130)**
Date exports value	4.4	127.483	0.825	$LnY = 3.912 + 0.0436T$ (58.953)** (11.290)**
Average export price	1.9	17.139	0.388	$LnY = 6.467 + 0.0186T$ (83.748)** (0.0186)**
The value of agricultural exports	10.07	180.175	0.869	$LnY = 12.385 + 0.1007T$ (96.067)** (13.422)**

Note: ** indicates significance at the probability level of 1%; * indicates significance at the probability level of 5%.

Source: Compiled and calculated from the World Food and Agriculture Organisation database for the 1990–2018 periods.

Through the geographical distribution of the quantity of Saudi exports of dates according to the data in Table 3, it becomes clear that there is a clear discrepancy in the average export price of Saudi dates between the various importing countries wherein the export price ranged between a minimum of $559.9 per tonne for Syria and a maximum of $4,368.2 per tonne for South Africa. By calculating the index of the average export price of Saudi dates for various countries relative to the average export price to Syria, the lowest-priced importing country for Saudi dates, it becomes clear that the average export price of South Africa exceeds its estimated counterpart for Syria by 680.15%.

3.2.   Indicators of Competitiveness of Saudi Dates Exports

The competitiveness of Saudi date exports was determined by calculating several indicators, the most important of which are the following.

3.2.1. *The Apparent Comparative Advantage of Saudi Date Exports*

It is clear from the data presented in Table 4 that the apparent comparative advantage index for Saudi date exports ranged between a minimum of 26.61 in 2007 and a maximum of 86.25 in 1997 AD, with an annual average of 48.83, and a variation factor of 29.9% during the 1990–2018 periods.

There is a clear discrepancy between the upper and lower limits of the comparative advantage index for date exports, as the percentage of the difference between the minimum and the upper limits to the annual average was 122.1%. From the above, it is clear that the apparent comparative advantage index for Saudi date exports is greater than one, which means that Saudi Arabia has an apparent comparative advantage in date exports during the study period.

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3.2.2. *Actual Performance of Saudi Foreign Trade in Dates*

It is evident from the data in Table 4 that the actual performance index for Saudi Arabia's foreign trade in date's ranges between a minimum of 27.1 in 2007 and a maximum of 90.3 in 1997, with an annual average of 50.03, with a difference factor of 31.8% during the 1990–2018 periods.

There is a clear discrepancy between the minimum and the upper limit of the actual performance indicator for the foreign trade in Saudi dates, as the percentage of the difference between the upper and lower limits to the annual average was 126.2%. From the above, it is clear that the value of the actual performance index for the foreign trade of Saudi dates took a positive value, which indicates that Saudi Arabia enjoyed a competitive advantage in the foreign trade of dates during the 1990–2018 periods.

Table 3: Geographical distribution of the quantity and value of Saudi date exports during the 1990–2018 period.

Country	The quantity of exports is in tonnes	Relative importance %	The value of exports is in thousand dollars	Relative importance %	Average export price	Price index
Bahrain	1183.6	1.437	1162.9	1.47	982.5	175.47
Bangladesh	818.4	0.994	957.9	1.21	1170.5	209.04
Djibouti	1168.7	1.419	871.5	1.10	745.7	133.18
India	1921	2.333	1883.4	2.38	980.4	175.10
Jordan	6131.3	7.446	7580.8	9.59	1236.4	220.82
Kenya	433.5	0.526	270.8	0.34	624.7	111.57
Kuwait	8130.7	9.875	5626.4	7.12	692.0	123.59
Lebanon	3125.1	3.795	4914.8	6.22	1572.7	280.88
Oman	1191.89	1.448	1825.22	2.31	1531.4	273.50
Pakistan	621.6	0.755	580.1	0.73	933.2	166.67
Qatar	2758.22	3.350	5607.67	7.10	2033.1	363.10
Somalia	3920	4.761	3395.5	4.30	866.2	154.70
South Africa	151	0.183	659.6	0.83	4368.2	780.15
Syria	1494.86	1.815	837	1.06	559.9	100.00
Turkey	9006.8	10.939	8397	10.63	932.3	166.51
United Arab Emirates	15583.5	18.926	20521.5	25.97	1316.9	235.19
Yemen	24699.9	29.997	13923.1	17.62	563.7	100.67
Total	82340.1	100	79015.2	100	959.6	171.39
Geographical concentration factor	0.4	-	0.37	-	-	-

Source: Compiled and calculated from the World Food and Agriculture Organisation database for the 1990–2018 period. Ministry of Environment, Water and Agriculture, Agricultural Statistical Yearbook.

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Table 4: Some indicators of the competitiveness of Saudi date exports during the 1990–2018 periods.

Year	Apparent comparative advantage	Actual foreign trade performance	Market share (%)
1990	52.87	54.95	5.88
1991	33.76	34.54	4.66
1992	40.35	41.66	5.18
1993	62.22	65.67	8.68
1994	47.14	48.72	5.00
1995	64.14	67.30	6.62
1996	67.76	71.49	5.81
1997	86.25	90.25	8.90
1998	66.31	69.10	7.04
1999	33.47	34.15	2.06
2000	62.79	65.27	7.27
2001	69.39	72.41	7.40
2002	70.73	73.94	8.80
2003	42.20	43.30	7.62
2004	56.81	58.44	10.44
2005	38.71	39.71	7.42
2006	39.54	40.49	8.32
2007	26.61	27.11	6.52
2008	48.32	51.43	8.39
2009	32.77	33.11	5.83
2010	36.50	37.42	10.07
2011	36.26	37.09	9.56
2012	37.09	34.02	8.91
2013	45.95	42.67	10.43
2014	37.40	36.09	9.02
2015	38.89	38.66	10.74
2016	40.09	40.10	10.49
2017	47.65	47.43	11.25
2018	54.06	54.23	11.85
Average	48.83	50.03	7.94
Maximum	86.25	90.25	11.85
Minimum	26.61	27.11	2.06
The difference between the maximum and minimum	59.64	63.13	9.79
The ratio of the difference between the two limits to the mean	122.14	126.20	123.36
Standard deviation	14.60	15.91	2.28
Coefficient of variation%	29.90	31.80	28.71

Source: Compiled and calculated from the World Food and Agriculture Organisation database for the 1990–2018 period. Ministry of Environment, Water and Agriculture, Agricultural Statistical Yearbook.

3.2.3. The Penetration Rate of Saudi Date Exports Into the Most Important International Markets

It is also evident from the data presented in Table 5 that the penetration rate of Saudi date exports into international markets ranged between a minimum of 0.006% in the country of Bangladesh and an upper limit of 101.34% in South Africa. Through the market penetration rate index, it is evident that Saudi Arabia has a competitive advantage in date exports in South Africa, followed by the Emirates, Pakistan, Jordan, Djibouti, Turkey and Syria.

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3.2.4. *Market Share of Saudi Date Exports*

It is evident from the data in Table 5 that the market share of Saudi date exports from the value of global exports of dates ranged between a minimum of 2.06% in 1999 and a maximum of 11.85% in 2018, with an annual average estimated at about 7.94% during the 1990–2018 period, with the coefficient of variation reaching 28.71%. There is a clear discrepancy between the minimum and the upper limit of the market share index for Saudi date exports, as the ratio of the difference between the upper and lower limits to the annual average was 123.36%.

On the international market level, the market share of Saudi date exports was estimated by dividing the percentage of the selected country's imports of Saudi dates to the total amount of the state's imports of dates. It is clear from the data in Table 5 that the market share of Saudi date exports in the international markets ranged between a minimum of 0.30% for India and a maximum of 71.33% for Kuwait.

Table 5: The market penetration rate and the market share of Saudi date exports in the most important international markets during the 1990–2018 period.

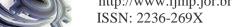| Country	The amount of imports from Saudi Arabia in tonnes	Country production in tonnes	Total imports country in tonnes	The quantity of exports to the country in tonnes	Market penetration rate%	Market share%	The value is in thousand dollars
Bahrain	11836	371362	40493	427	0.104	29.23	11629
Bangladesh	8184	0	466631	27	0.006	1.75	9579
Djibouti	11687	2587	24625	2520	10.206	47.46	8715
India	19210	0	6478135	13774	0.213	0.30	18384
Jordan	61313	181916	256303	68315	18.468	23.92	75808
Kenya	4335	31827	42808	1577	2.159	10.13	2708
Kuwait	81307	1081708	113990	8146	0.686	71.33	106092
Lebanon	31251	0	157600	4536	2.963	19.83	49148
Oman	10727	7229892	126755	223125	3.128	8.46	16427
Pakistan	6216	14900342	502767	2586267	20.179	1.24	5801
Qatar	24824	549720	88673	5682	0.898	27.99	50469
Somalia	39200	324535	114430	73	0.017	34.26	33955
South Africa	1510	0	39901	20083	101.337	3.78	6596
Syria	10464	80184	291786	14219	3.975	3.59	5859
Turkey	90068	578339	361087	50690	5.704	24.94	83970
United Arab Emirates	155835	13549410	2668030	4489714	38.283	5.84	205215
Yemen	246999	1104877	587474	5730	0.340	42.04	139231

Source: Compiled and calculated from the World Food and Agriculture Organisation database for the 1990–2018 period. Ministry of Environment, Water and Agriculture, Agricultural Statistical Yearbook.

3.3.   The Impact of Competitiveness on Saudi Exports of Dates

The quantity of Saudi date exports is determined by a set of economic factors, the most important of which are (1) domestic production (x1), (2) the export price of Saudi dates (x2), (3) Saudi consumption of dates (x3) and (4) competitiveness, expressed according to the rate of the actual performance of the foreign trade in dates (x4).

By conducting a multi-step regression analysis of the explanatory variables specified for the quantity of Saudi exports of dates during the 1990–2018 period in double logarithmic form, the estimated model can be expressed, after eliminating the self-correlation using the following equation:

$$\text{LnY} = -15.11 + 11.93\,\text{LnX}_1 - 10.19\text{LnX}_3 + 0.384\,\text{LnX}_4 + 0.381\text{AR}(1) \qquad (7)$$

$$(-3.94)^{**}\quad (8.60)^{**}\quad (-7.45)^{**}\quad (2.126)^{*}\quad (1.905)^{*}$$

$$R^2 = 0.91\ F = 55.28\ D.\,W. = 2.16$$

$$\text{LM test} = 0.424\ \text{Arch test} = 0.85$$

It is clear from the estimated model that an increase in domestic production by 10% leads to an increase in the quantity of exports by 119.3%, while a 10% increase in the domestic consumption of dates leads to a 101.9% decrease in the quantity of Saudi date exports and a 10% change in capacity. The competitiveness of Saudi dates, expressed as the rate of the actual performance in the foreign trade of dates, leads to a change in the same direction for the quantity of Saudi exports of dates by 3.8%. In light of the Breusch–Godfrey serial correlation (Lagrange multiplier Test), the value of (F) was 0.849, which is not statistically significant, indicating that the estimated model is devoid of the self-correlation problem of the remainder. It is also evident from the Arch Test that the value of (F) was 0.424, which is not statistically significant, indicating that the estimated model has no self-correlation in the series variance.

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