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Performance of Egyptian Cotton Exports in International Market

Assem Abu Hatab*
Program of International Trade & Policy of Agricultural Products,
College of Economics and Management, Northwest Agriculture and Forestry University, Yangling, Shaanxi 712100, China

Abstract

The performance of Egyptian cotton exports (ECE) has been examined in the international markets during the period 1990-2006. The study has revealed a high degree of geographic concentration of ECE in India, Italy, the Republic of Korea, and Japan. Together, these markets had imported about 50 per cent of ECE during 1990-2006. The competitive advantage of Egyptian cotton has been found to be dependent on its quality not price. Japan, the Republic of Korea and Italy had provided the most stable markets for ECE during the study period. Linear regression analysis has suggested that one per cent increase in the Egypt-to-USA export price ratio leads to a decrease in ECE by about 27.8 thousand tonnes. This analysis has also shown a positive and significant effect of the World Trade Organization on ECE. The study has revealed the possibility of increasing ECE to the Indian and Korean markets.

Introduction

Egypt is known as an exporter of high quality cotton, which has an international reputation in special features that attract niche market consumers. Cotton plays a dominant role in the country's economy by meeting the domestic and export demands, contributing significantly to agriculture, industry, employment and export earnings. The 2006 statistics[1] show that Egyptian cotton provided a cash income to roughly one million small farmers. In addition, the cotton industry labour force totals to about 1 million.

With the increasing importance of Egyptian cotton at the domestic and international levels, the government pays great importance to and constantly seeks to improve both quantity and quality of cotton. This ensures the competitiveness of Egyptian cotton in the international markets. However, the share of Egyptian cotton exports (ECE) in the world cotton exports has dropped from 4 per cent in 1980 to 1.06 per cent in 2006. The total quantity of ECE has also fallen from 196.8 thousand tonnes in 2003 to 87.2 thousand tonnes in 2006.

This paper has examined ECE trends in the international market during the period 1990-2006. It has identified the geographic distribution and major international markets for ECE. In addition, it has examined the competitive position of ECE and finally, has identified the important factors that influence ECE.

Methodology and Data Sources

Both descriptive and quantitative methods have been used to show the relative importance of ECE at the national and international level. Averages and percentages of annual change have expressed the geographic distribution of ECE, while time trend equations have expressed trends in ECE.

The competitive position expresses the changes of export quantities of a given commodity, while these changes reflect the shift in demand from a country's exports to the exports of its competitors. This has been analyzed by employing the following four economic indicators:

The relative price index, which expresses the ratio of Egyptian export price to the export price of

*Email: assem_hatab@hotmail.com

[1]Ministry of Agriculture and Land Reclamation, Central Department of Agricultural Economics, *Agricultural Economics Bulletin*, 2006.

competing countries, it can be calculated using Equation (1):

$$p_{s/f} = \frac{p_s}{p_f} \quad \ldots(1)$$

where, $p_{s/f}$ is the relative price index, p_s is the export price of a given country, and p_f is the export price of competing country.

Market share index explains the relative importance of export quantities of a given country in the total imports of another country. The larger the value, the more the country in question dominates the exports to an importing country. It can be expressed by Equation (2):

$$MS_{e/f} = \frac{QE_e}{QI_f} \times 100 \quad \ldots(2)$$

where, $MS_{e/f}$ is the market share of the cotton exports of the country (*e*) compared to the total imports of a given importing market (*f*), QE_e is the quantity of cotton exported by the country (*e*) to the importing market (*f*) and QI_f is the total imports of cotton by the country (*f*).

Market penetration index, which gives an indication of the degree to which a country is able to expand its exports to a given importing market, can be obtained from Equation (3):

$$MPI_{e_t/f} = \sum \left[\frac{QE_{e_t/f}}{\left(TQI_{f_t} + P_{f_t} - QE_{f_t}\right)} \right] \quad \ldots(3)$$

where, $QE_{e_t/f}$ is the quantity of exported commodity (*t*) by the country (e) to the importing market (*f*) , TQI_f is the total quantity of imports of the commodity (t) by the country (*f*), P_{f_i} is the production of the commodity (*t*) in the country (*f*), and QE_{f_i} is the quantity of the exported commodity (*t*) by the country (*f*) . The higher the market penetration index, the easier it is for the country in question to access the foreign market and expand its exports.

Instability coefficient represents the year-to-year fluctuations in exports. It is defined by export instability. Mathematically, it can be defined by the difference between the actual and estimated value of exports and can be estimated by using the formula (4):

$$IC = \sum \frac{\left|Y_t - \hat{Y}_t\right|}{\hat{Y}_t} \times 100$$

where, Y_t is the actual quantity, or price of exports in the year (*t*), $\hat{Y}_t$ is the estimated value of the quantity or price of exports in the year (*t*), calculated by the linear trend method.

Finally, factors influencing ECE were identified by employing the simple regression technique. As per the available literature and previous studies on Egyptian cotton, the following factors may affect Egyptian cotton exports:

(x_1) = Percentage of Egyptian cotton self-sufficiency (%),

(x_2) = Percentage of world cotton self-sufficiency (%),

(x_3) = Average world per-capita consumption of synthetic fibre (kg/person),

(x_4) = Egyptian export price (thousand USD/tonne),

(x_5) = International export price (thousand USD/ tonne),

(x_6) = US export price (thousand USD/tonne),

(x_7) = Ratio of Egyptian export price to US price,

(x_8) = Quantity of Egyptian cotton production (thousand tonnes),

(x_9) = Cultivated area of Egyptian cotton (thousand hectares), and

(x_{10}) = Dummy WTO variable, which assumes a value of zero for the period before Egypt joined the WTO (1990-1995), and takes the value of one during the period after Egypt joined WTO (1996-2006).

The paper, first, calculated the simple correlation matrix for all independent variables (shown in Table 7). Secondly, the regression technique was used to identify the most important variables, by choosing variables that were most highly correlated with ECE quantities. The test was run between the total ECE quantities as a dependent variable and the ten factors mentioned above being treated as independent variables. Simple linear regression provided a good fit. The R square value, for the last two variables,

revealed that the existing model could explain 99.4 per cent of the changes in ECE. The F value has been found as 111.75, which was significant at the 1 per cent level, suggesting overall applicability of the existing model.

Data sources included publications of the Food and Agriculture Organization (FAO), the Arab Organization of Agricultural Development, statistics released by the Egyptian Ministry of Agriculture, the Central Agency for Public Mobilization and Statistics (CAPMAS), and the Egyptian Ministry of Foreign Trade and Industry.

Results and Discussion

Performance of Egyptian Cotton Exports

The data depicting the relative importance of Egyptian cotton at the international and domestic levels have been given in Table 1, which shows that ECE accounted for 1.06 per cent of world cotton exports (WCE) in 2006, it being 35.9 per cent higher than it was in 1990. The maximum ECE was recorded in 2003, hitting 3.05 per cent of the WCE. The trend Equation (1) in Table 2 shows that the share of ECE increased significantly at a rate of about 3.2 per cent annually during 1990-2006.

A comparison of the share of ECE with total Egyptian agricultural exports (EAE) [Equation (2) in Table (2)] shows that ECE increased significantly at rate of about 0.7 per cent annually. Table 1 indicates that the ratio of cotton exports to other agricultural exports dropped from a maximum value of 13.4 per cent in 1994 to about 5.7 per cent in 2001. After reaching 11.3 per cent in 2002, the share of ECE continued to decline to 6.5 per cent in 2006, which may be attributed to the increase of total EAE in recent years.

As regards trends in the ratio of ECE to Egyptian cotton production, Table 1 shows that it fluctuated

Table 1. Export quantity and price of ECE with relative importance of ECE in world cotton exports, Egyptian agricultural exports, and Egyptian production of cotton: 1990-2006

Year	Quantity of ECE (thousand tonnes)	Export price of ECE (thousand USD)	Percentage of Egyptian production of cotton	Percentage of Egyptian agricultural exports	Percentage of ECE in world cotton exports
1990	39.4	4.8	13.0	3.64	0.78
1991	13.0	4.7	4.30	1.91	0.26
1992	15.5	3.4	4.20	2.00	0.32
1993	18.4	2.4	4.4	2.52	0.40
1994	113.2	2.1	44.4	13.43	2.13
1995	67.4	2.3	27.9	6.83	1.24
1996	23.3	3.9	6.7	2.11	0.42
1997	39.4	2.6	11.5	5.24	0.77
1998	66.3	2.4	28.8	6.23	1.21
1999	111.5	2.1	47.9	10.30	2.51
2000	63.2	2.1	28.1	8.0	1.08
2001	81.6	2.3	24.7	5.74	1.44
2002	161.1	2.0	55.6	11.32	2.91
2003	196.8	1.9	62.91	11.13	3.05
2004	183.7	2.6	62.89	7.72	2.65
2005	116.7	1.5	44.2	7.18	1.44
2006	87.2	1.6	13.0	6.46	1.06
Mean	82.22	2.6	28.50	6.57	1.39

Source: Data collected and calculated from: 1. *FAO Trade Year Book* (1990-2006) (Different Issues). 2. Ministry of Agriculture and Land Reclamation, Central Department of Agricultural Economics, *Agricultural Economics Bulletin*, (1990-2006) (Different Issues).

between a maximum of 62.9 per cent in 2003 and a minimum of 4.2 per cent in 1992, the average value being 28.5 per cent for the period 1990-2006. The trend Equation (3) in Table 2 indicates that the ratio of ECE to Egyptian cotton production increased at an annual rate of about 0.2 per cent.

Figure 1 shows that ECE quantities fluctuated between a minimum of 13 thousand tonnes in 1991 and a maximum of 196.8 thousand tonnes in 2003, with an average of 82.2 thousand tonnes during 1990-2006. For the period analyzed, the trend Equation (4) in Table (2) indicates that ECE quantities have increased at a significant rate of 63 tonnes per year, which means an average increase of about 0.08 per cent or 82.2 thousand tonnes.

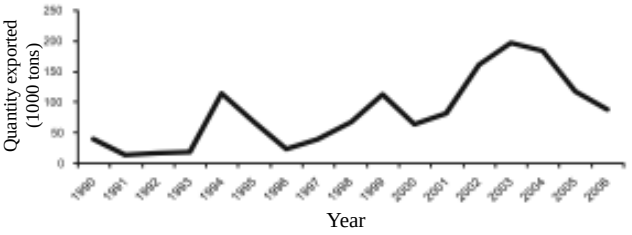


Figure 1. Trends in quantities of Egyptian cotton exports during the period 1990-2006

The export price of Egyptian cotton averaged at 2.63 thousand USD during 1990-2006. Equation (5) of Table 2 shows that the price has a significant decline at a rate of 3.82 USD per tonne annually during 1990-2006. As shown in Figure 2, the export price decreased from its maximum value of 4.8 thousand US dollar per tonne in 1990 to 1.6 thousand US dollars per tonne in 2006, representing a decrease of 66.7 per cent between 1990 and 2006. Due to the declining ECE prices in recent years, quantities rose to an all-time high of 196.8 thousand tonnes in 2003, being 225.7 per cent of the average for 1990-2006.

On reviewing Equation (4) in Table 2, it can be concluded that the past five years (2001-2006) in

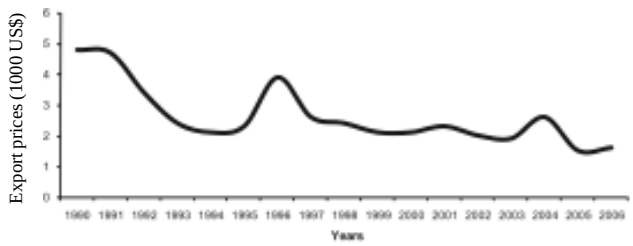


Figure 2. Trends in export price of Egyptian cotton: 1990-2006

general and the period 2002-2004 in particular, witnessed the best performance of ECE. This can be attributed to an increase in competitive ability as a result of declining export prices, adoption of a new reform policy for Egyptian agricultural foreign trade and government subsidies to cotton farmers, which amounted to 33 million USD in 2002-03.

Geographical Distribution of Egyptian Cotton Exports by Major Countries of Destination

Figure 3 shows the pattern of percentage distribution of ECE by major importers. During the period under consideration, India was the largest importer of Egyptian cotton, representing 17.9 per cent of ECE, followed by Italy (15.0 per cent), the Republic of Korea (9.3 per cent), and Japan (7.9 per cent). These top four importers together accounted for about 50 per cent of the total cotton exports from Egypt during 1990-2006.

The phase-wise study of ECE during three phases, viz. 1990-95, 1996-2001 and 2002-06 has been depicted in Table 3. A perusal of Table 3 revealed that Japan was the biggest importer of Egyptian cotton in 1990-95, with a share of 13.4 per cent, followed closely by Indian (13.34 per cent). During the second phase, viz. 1996-2001, the largest increase was seen in cotton imports by Italy, which increased from 10.3 per cent in 1990-95 to 23.8 per cent in 1996-2001, depicting an increase of 131 per cent over the first period. ECE to both Thailand and China recorded moderate increases of 37 per cent, and 13 per cent, respectively. In contrast, German imports recorded a sharp fall of about 53.6 per cent in 1996-2001, followed by decreases in Japanese (44.5 per cent), Korean (31.5 per cent) and Indonesian (24.3 per cent) imports.

During the third phase, 2002-2006, cotton imports by India continued to increase, representing one-fifth of ECE. The import of Egyptian cotton by USA is worth noting, depicting an increase from 0.22 per cent to 10.3 per cent over the period 1996-2006. It is also quite obvious that Chinese imports have been gradually gaining larger shares of ECE, from 1.98 per cent to 5.37 per cent during the study period. Conversely, the steepest falls in imports of Egyptian cotton were recorded by Turkey and Italy, whose imports dropped from 12.3 per cent and 23.8 per cent, in 1996-01 to 5.4 per cent and 12.6 per cent, respectively in 2002-06. These represent declines of 56.5 per cent and 47.3 per

Table 2. Trend equations for relative importance of ECE in world cotton exports, Egyptian agricultural exports, Egyptian production of cotton, export price and exported quantity: 1990-2006

No.	Data	Equation	t-value	Mean	R^2	Significance
1	Share of ECE in WCE, %	$\hat{Y}_t = 4.516 + 3.221X_t$	2.41	1.39	0.23	*
2	Share of ECE in EAE, %	$\hat{Y} = 4.292 + 0.716X_t$	2.85	6.57	0.35	**
3	Per cent of export / production	$\hat{Y}_t = 4.768 + 0.148X_t$	3.02	28.50	0.38	**
4	Quantity of ECE	$\hat{Y}_t = 3.827 + 0.063X_t$	4.06	82.22	0.52	**
5	Export price	$\hat{Y}_t = 19.057 - 3.825X_t$	-4.37	2.63	0.56	**

Note: *5% level of significance, **1% level of significance.
Source: Calculated from Table 1 and Figures 1 and 2.

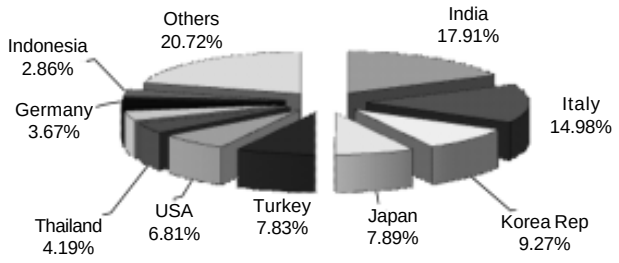
Table 3. Percentage distribution of ECE by major countries of destination, during 1990-1995, 1996-2001 and 2002-2006

County of destination	1990-1995		1996-2001		2002-2006	
	Average period (in tonnes)	Percentage of Egyptian cotton exports	Average period (in tonnes)	Percentage of Egyptian cotton exports	Average period (in tonnes)	Percentage of Egyptian cotton exports
India	5934.67	13.34	9750.17	15.18	28294.36	20.97
Italy	4590.17	10.32	15307.67	23.84	16944.11	12.56
Korea Republic	4734.50	10.64	4683.50	7.29	13061.25	9.68
Japan	5980.17	13.44	4783.67	7.45	8038.61	5.96
Turkey	3873.33	8.71	7906.17	12.31	7234.86	5.36
USA	98.00	0.22	3139.33	4.89	13850.39	10.26
Thailand	1072.33	2.41	2126.17	3.31	7141.53	5.29
China	879.67	1.98	1447.83	2.25	7240.81	5.37
Germany	3120.67	7.02	2090.33	3.26	3491.72	2.59
Indonesia	1188.67	2.67	1298.50	2.02	4488.58	3.33
Others	13011.17	29.25	11683.33	18.19	25166.56	18.65

Source: CAPMAS, Annual Statistics Book, Different issues (1990-2006)

cent, respectively. Japanese and German imports of Egyptian cotton have also experienced slight declines of about 20 per cent.

Thus, some destinations had acquired greater relevance, namely China and the USA. Certain countries, like Italy and Turkey, seemed to have attracted ECE during particular periods. Some other destinations, like Japan and Germany, have witnessed continuous declines across the periods analyzed. There is a higher degree of concentration of ECE in a few counties like India, Italy, the Republic of Korea and Japan where the imports of cotton jointly amounted to about 50 per cent of ECE during 1990-2006. This heavy



Source: CAPMAS (1990-2006) *Annual Statistics Book* (different issues).

Figure 3. Percentage distribution of ECE by major countries of destination: 1990-2006

reliance on a limited number of markets has created a vulnerability to changes in demand for Egyptian cotton exports. At the same time, geographic concentration of export destinations has left Egyptian cotton exporters vulnerable in the case of rapid changes in the political or economic situations of their key trade partners.

Competitive Position of ECE in the International Market

Relative Price Index

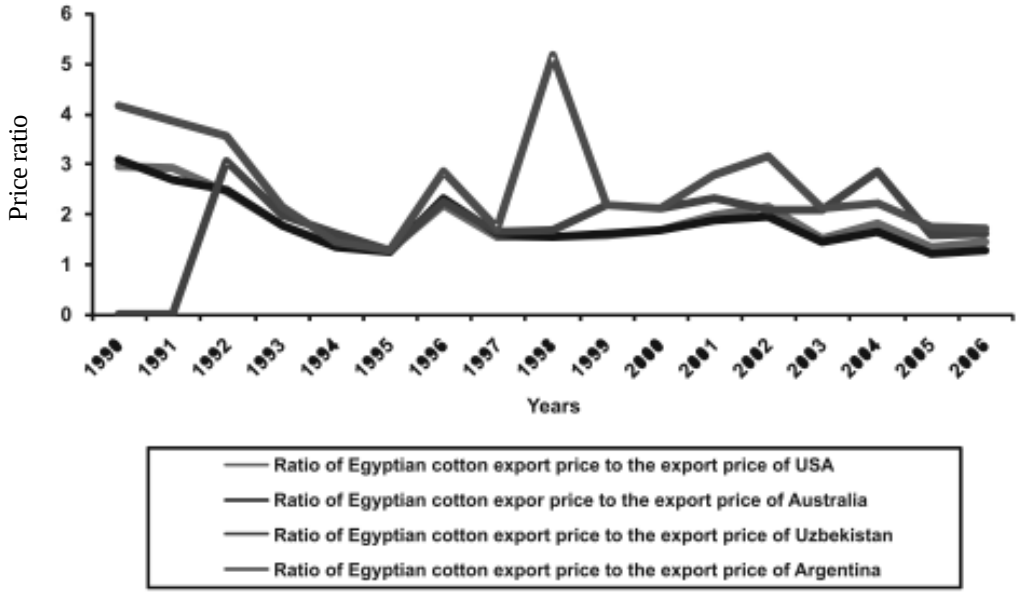
The ratio of Egyptian export price to export prices of its major competitors in international markets has been depicted in Figure 4. This ratio averaged to about 2.60 in the Argentinean market during 1990-2006, followed by the American, Australian, and Uzbek markets by average of about 1.8 during this period.

Higher Egyptian export prices have suggested that the competitive advantage of Egyptian cotton depends on quality and not price. Egyptian cotton still maintains its status in international markets despite low prices of the competing cottons, not to mention Egypt's commitment to a set of obligations under the international, regional, and Arab economic blocs, which led to an increase in the demand for Egyptian cotton regardless of its high export price.

Market Share Index

The market shares of both ECE and its major competitors in the key importing markets have been summarized in Table 4. Over the two study periods, viz. 1990-95 and 2001-06, America was the major supplier of cotton to the Indian market, with its market share climbing from 9.9 per cent in 1990-1995 to about 38.8 per cent in 2001-2006. Egyptian cotton ranked second after American cotton in achieving a market share of about 17 per cent of the total Indian cotton imports, representing an average growth rate of 121.8 per cent for the study periods. For the Italian market, Grecian cotton exports were significant, recording a market share of about 14.8 per cent in 2001-2006. Egyptian cotton registered the highest increase in market share, amounting to 430.4 per cent over the above mentioned two periods.

Table 4 has also revealed that the Japanese market was dominated by the American and Australian cotton exports, since their exports jointly accounted for 67.3 per cent and 75.3 per cent, respectively, in 1990-1995 and 2001-2006. Egyptian cotton exports accounted for 1.3 per cent and 7 per cent, respectively, of the Japanese total cotton imports during the study periods, registering an average growth rate of 451.6 per cent.



Source: F.A.O. (1990-2006) *Trade Year Book*, (different Issues).

Figure 4. Ratio of Egyptian export price of cotton to the export prices of major competing countries: 1990-2006

Table 4. Market share of Egyptian cotton exports, and major competitors in key importing markets of Egyptian cotton during 1990-1995 and 2001-2006

Major importers of Egyptian cotton (MI)	Major exporters of cotton (ME)										Cotton imports of MI from ME		Total imports of MI ('000 tones)	
	Egypt		USA		Australia		Greece		Argentina					
	1990-1995	2001-2006	1990-1995	2001-2006	1990-1995	2001-2006	1990-1995	2001-2006	1990-1995	2001-2006	1990-1995	2001-2006	1990-1995	2001-2006
India	7.662	16.99	9.86	38.76	8.67	5.70	0.53	4.78	3.46	0.63	30.18	66.86	210.37	1275.68
Italy	1.351	7.16	5.75	6.32	3.19	5.55	5.66	14.79	1.89	0.06	17.84	33.88	2329.99	1408.177
Japan	1.268	6.95	44.24	38.60	23.02	36.68	0.00	0.48	0.20	0.00	68.73	82.71	3364.57	1178.4
R. Korea	1.319	4.41	31.32	43.93	10.98	24.78	0.25	2.09	0.27	0.00	44.14	75.21	2569.61	1820.877
Thailand	0.336	1.82	32.19	27.78	5.13	18.60	0.60	0.26	2.65	0.54	40.91	49.00	2320.28	2521.91
Turkey	2.575	1.25	21.38	45.47	0.44	0.11	8.98	18.83	1.42	0.12	34.80	65.78	954.29	3549.63

Source: Collected and calculated from: 1. F.A.O., *Trade Yearbook*, (1990-2006) Different Issues

2. CAPMAS, *Annual Statistics Book*, (1990-2006) Different issues

Although ECE to Korean and Thai markets have increased by about 236.6 per cent and 451.5 per cent, respectively, their market shares were always lower than 5 per cent. Lastly, as regards the Turkish market, American cotton exports ranked first, growing from 21.4 per cent in 1990-1995 to 54.5 per cent in 2001-2006. These are followed by Grecian cotton exports which amounted to about 9 per cent and 19 per cent, respectively.

The Egyptian cotton's market share in the Turkish market has witnessed a fall of about 45 per cent, as it decreased from 2.6 per cent in 1990-95 to 1.3 per cent in 2001-06. In conclusion, American and Australian cottons are the major competitors for Egyptian cotton in its key cotton-importing markets. Further, the highest rate of ECE's market share is 17 per cent in the Indian market, while for the remaining major importing countries Egyptian cotton's market share does not exceed 7.7 per cent during 1990-2006.

Market Penetration Index

The average market penetration index of Egyptian cotton for its major importing markets has been presented in Table 5. It is quite obvious that low values of the index reflect high level of competition and difficulties being faced by ECE while trying to penetrate the analyzed markets. Except for the Turkish market, the value of this index has increased for all the cotton-importing markets over the two study periods, 1990-95 and 2001-06. The values increased by about 266.6 per cent, 414 per cent, 238.4 per cent, 250 per cent and 500 per cent, respectively, in the Indian, Italian, Korean, Japanese and Thai markets.

On comparing the values of market share index in Table 5 with the market penetration index during 2001-2006, it could be inferred that the Indian market ranked first in terms of Egyptian cotton market share, whereas it ranked fifth using the market penetration index. Simultaneously, the Korean market ranked fourth in terms of the market share of Egyptian cotton, while it ranked second using the market penetration index. These two findings reflect the possibility of increasing ECE to both the Indian and Korean markets. In contrast, the Italian market ranked second in terms of the market share of Egyptian cotton, while it ranked first using the market penetration index. Accordingly, this finding indicates the difficulty in increasing the ECE into the Italian market.

Instability Coefficient

Figure 5 portrays the trends in the instability coefficient of export quantity and price of Egyptian cotton during 1990-2006. It is clear that ECE quantities are characterized by instability, since they fluctuated between a maximum of 151.7 in 1990 and a minimum of 17.2 in 2005, with an average of 50.8. Since 1999, the trend of ECE has become more stable. In terms of export price, Figure 5 shows that it was more stable when compared with quantities, as its average was 24.4 during 1990-2006.

On reviewing Figure 6, it is found that the Egyptian cotton has become more stable in all importing markets examined. Did instability coefficient drop in 2001-2006 in the Turkish, Thai, Indian, Italian, Korean and Japanese markets by about 69.2 per cent, 21.2 per cent, 15.7 per cent, 3.6 per cent, 69.7 per cent, and 89.1 per cent, respectively. It has been found that over the period 1990-2006, ECE witnessed higher stability in the Japanese, Korean and Italian markets by registering instability coefficients of 26 per cent, 44 per cent and 47 per cent, respectively.

Major Factors Influencing Egyptian Cotton Exports

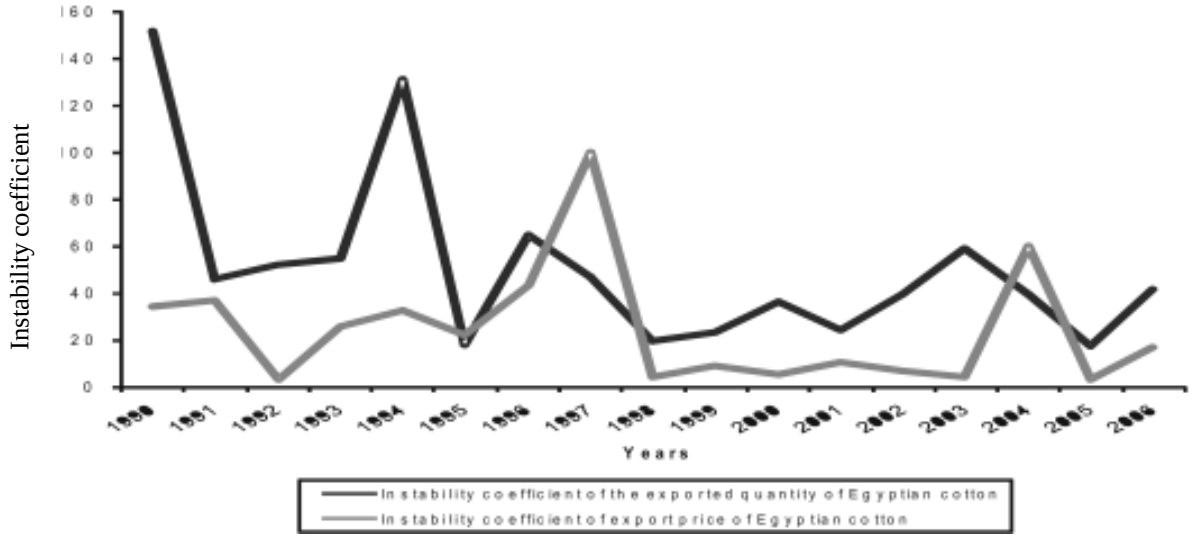
Results of the linear regression, presented in Table 6, indicate a negative but significant relationship between the ratio of Egypt-to-USA export price and the quantity of ECE. Since the increase in this ratio by

Table 5. Average market penetration index of ECE in major importing markets during 1990-1995 and 2001-2006

Periods	India	Italy	Korea Republic	Japan	Thailand	Turkey
1990-1995	0.003	0.014	0.013	0.012	0.001	0.026
2001-2006	0.011	0.072	0.044	0.042	0.006	0.012

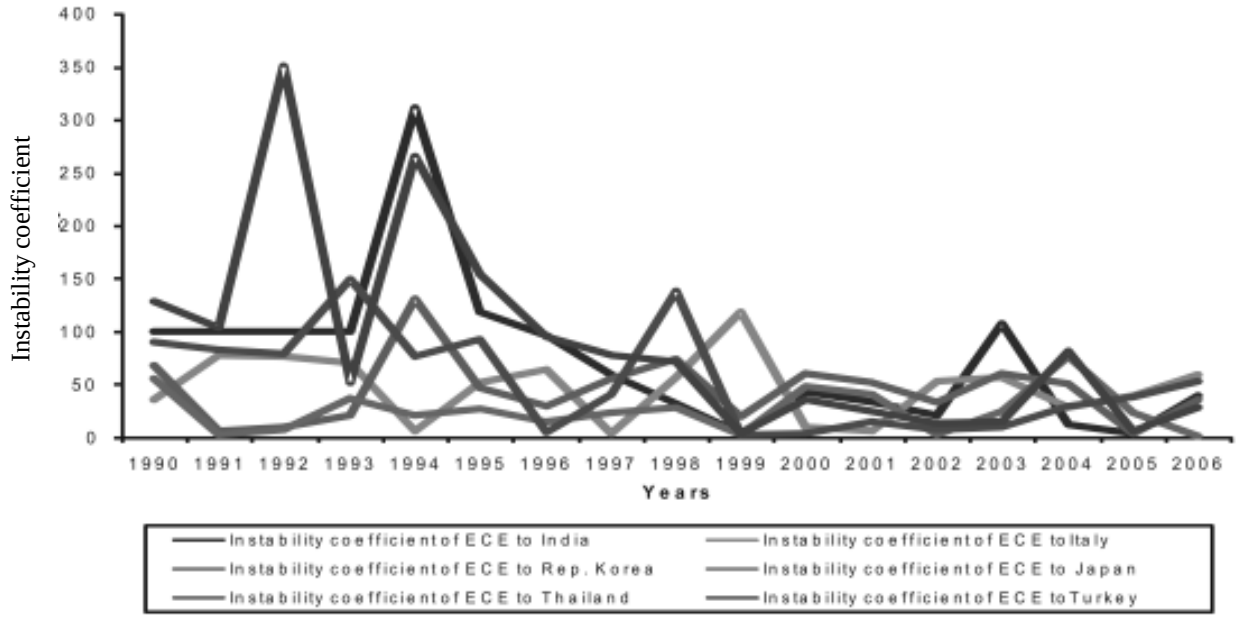
Source: Collected and calculated from: 1. F.A.O., *Trade Yearbook* (1990-2006) Different Issues

2. Arab Organization of Agricultural Development, *Annual Statistics Book* (1990-2006) Different issues. 3. CAPMAS, *Annual Statistics Book* (1990-2006) Different issues



Source: Data collected and calculated from: 1. F.A.O. (1990-2006) *Trade Year Book* (different Issues); and
2. Ministry of Agriculture and Land Reclamation, Central Department of Agricultural Economics, *Agricultural Economics Bulletin* (1990-2006) (Different Issues).

Figure 5. Trends of instability coefficient of exported quantity and export price of Egyptian cotton: 1990-2006



Source: Data collected and calculated from: 1. F.A.O. (1990-2006) *Trade Year Book* (different Issues); and
2. Ministry of Agriculture and Land Reclamation, Central Department of Agricultural Economics, *Agricultural Economics Bulletin* (1990-2006) (Different Issues).

Figure 6. Instability coefficient of ECE compared to major importing countries: 1990-2006

Table 6. Results of simple linear regression between the ECE quantity and the ten- independent factors, 1990-2006

Equation	R^2	F	D.W	Prob.	Significance
$\hat{Y}_c = 114.23 - 27.79X_7 + 31.212\ X_{10}$ (6.250) (-4.563) (2.686)	0.994	111.758	1.764	0.0000	**

Notes: The values within parentheses below the coefficients are their *t-values.*

**1 per cent level of significance.

Source: Collected and analyzed from: 1. F.A.O., *Trade Yearbook*, (1990-2006) Different Issues.

2. Ministry of Agriculture and Land Reclamation, Central Department of Agricultural Economics, *Agricultural Economics Bulletin* (1990-2006) Different Issues.

3 Egyptian Ministry of Foreign Trade and Industry, *Annual Statistics Bulletin* (1995-2006) Different Issues.

Table 7. Correlation matrix for the chosen independent variables influencing ECE

Variables	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
X_1	1	-0.4655	-0.1327	-0.1164	-0.2149	0.1404	-0.1667	0.0703	-0.1465	0.2337
X_2	-0.4655	1	-0.0726	0.3972	0.2904	-0.2478	0.3020	-0.2108	0.2022	-0.0177
X_3	-0.1327	-0.0726	1	-0.6017	-0.4729	-0.1158	-0.4083	-0.2873	-0.6264	0.6055
X_4	-0.1164	0.3972	-0.6017	1	0.7208	-0.1759	0.7257	0.3400	0.7670	-0.57251
X_5	-0.2149	0.2904	-0.4729	0.7208	1	-0.0774	0.4668	0.0701	0.6274	-0.4263
X_6	0.1404	-0.2478	-0.1158	-0.1759	-0.0774	1	-0.7057	0.1143	-0.0593	-0.13822
X_7	-0.1667	0.3020	-0.4083	0.7257	0.4668	-0.7057	1	0.0762	0.5585	-0.3327
X_8	0.0703	-0.2108	-0.2873	0.3400	0.0701	0.1143	0.0762	1	0.5979	-0.4244
X_9	-0.1465	0.2022	-0.6264	0.7670	0.6274	-0.0593	0.5585	0.5979	1	-0.5565
X_{10}	0.2337	-0.0177	0.6055	-0.5725	-0.4263	-0.1382	-0.3327	-0.4244	-0.5565	1

one per cent leads to a decrease in the quantity of Egyptian cotton exports by about 27.79 thousand tonnes, it may be attributed to the price-leadership of the USA in the international cotton market. This, in turn, reflects the influence of the USA export price on ECE. The results have also indicated a positive and significant effect of WTO on ECE. This increase in ECE, since Egypt joined the WTO, may be attributed to Egypt's attempt to find a firm place for its agricultural exports under the fierce competition which it faces, through the reform policy of Egyptian foreign agricultural trade, adoption of modern production techniques and use of new varieties to reach the high quality specifications required in the international markets.

Conclusions

The performance of Egyptian cotton exports (ECE) has been examined in the international market during the period 1990-2006. Results have shown that ECE amounted to 1.06 per cent of world cotton exports (WCE) in 2006, being 35.9 per cent higher than in 1990. From 2002 to 2006, the share of ECE in Egyptian agricultural exports (EAE) has continued to decline to 6.46 per cent in 2006, which has been attributed to the increase in the total EAE in recent years. The price of ECE has decreased significantly by 3.82 USD per ton annually over the period 1990-2006. Due to the decline in ECE prices in recent years, during 2003 a 225.7 per cent increase in ECE was seen, compared to the average of 1990-2006. The study has shown that the period 2002-2004, witnessed the best performance of ECE, which was attributed to the increase in competitiveness, decline in export prices, adoption of a new reform policy for Egyptian agricultural foreign trade, and government support to cotton farmers, estimated at 33 million US dollar in 2002-03.

As for the geographic distribution, the results have revealed that some destinations have acquired greater relevance, namely China and the USA. Certain countries, like Italy and Turkey, seem only to have attracted ECE during particular periods. Other destinations, like Japan and Germany, have witnessed continuous declines. The study has also found that ECE

is characterized by geographic concentration, with the imports of India, Italy, the Republic of Korea, and Japan together amounting to about 50 per cent of ECE during the period 1990-2006.

On examining the comparative position of ECE, the relative price index has illustrated that the export price has always been higher of Egypt than other competing countries, which suggests that the competitive advantage of Egyptian cotton depends on quality not price. That highest ECE market share was 17 per cent in the Indian market. Except for this rate, market share index has not exceeded 7.7 per cent in other importing markets. However, the market penetration index for India, Italy, Korea, Japan and Thailand has increased by about 266.6 per cent, 414 per cent, 238.4 per cent, 250 per cent and 500 per cent, respectively over the two periods, viz. 1990-95 and 2001-06. Low values of this index reflect the high level of competition and difficulties in ECE. The study has revealed the possibility of increasing ECE to the Indian and Korean markets, whereas it has found difficult to increase ECE to the Italian market. The instability index of exported quantity has fluctuated between a maximum value of 151.7 in 1990 and a minimum value of 17.2 in 2005. In contrast, export price has been more stable than their export quantities, recording an average of 24.41 per cent. The ECE to the Indian market have gradually become more stable from 1996 to 2006.

The results of linear regression analysis have indicated a negative but significant relationship between the ratio of Egypt-to-USA export price and the quantity of ECE. An increase of one per cent in this ratio leads to a decrease in the quantity of Egyptian cotton exports by about 27.8 thousand tonnes. The results have also indicated a positive and significant effect of the WTO on ECE. This may be the result of Egypt's attempt to find a firm destination for its agricultural exports under the fierce competition which it faces, through the reform policy of Egyptian foreign agricultural trade, adoption of modern techniques of production and use of new varieties to achieve high quality specifications required in the international markets.

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