Egyptian Agricultural Exports Competitiveness

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SUMMARY

The study dealt with the competitiveness of Egypt's agricultural exports for the major commodity groups: Meat and meat preparations, Dairy products and bird eggs, Cereals and cereals preparations, Vegetables and Fruits, Sugar, sugar preparations and honey, Feeding stuff of animals, Beverages, Tobacco, Oils and fats, and Textile fiber and their waste.

The study has not restricted the estimated measure of the competitiveness to only the classical Revealed Comparative Advantage Index (RCA), it applied the other elaborated indices, in order to avoid unfavorable conclusions due to policy distortions and/or the export (supply) pattern and the Import (demand) pattern of the specified commodities. The relative export advantage index, [Ln(RXA)], results coincided with the RCA results in all food groups, which means that the "policy induced distortions" had the same impact on all studied food groups.

The RTA (Relative Trade Advantage) and RC (Revealed Competitiveness) indices consist with the real world economic phenomenon of two ways trade, i.e. the price and quantity differences of exports and imports. If exports share in the world market either surpassed much the imports, due to the price (quality), quantity (magnitude), or if both were too small (the case of oils and fats) then the results of RTA and RC would be quite different but more reliable than RCA. The study provided evidences for such conclusion. It seems that RC gives the most reliable results, as it considers the resultant from both values of exports and the percent of imports covered by the exports. Thereof, RC introduced vegetables and fruits to the front of competitiveness of Egypt's exports, as such group showed the highest value of exports and the second order of the (Exports/Imports) %. It was followed by textiles and fiber crops at the second order of the exports value but the first order with respect to (Exports/Imports) %. Although the exports value of beverages group came at the fourth order after cereals and preparations, dairy products and Eggs and sugar products, it surpassed much all of them as (Exports/Imports) %, which was around 168%, while it was 20%, 18% and 5% for the other three groups. Thereof, both RTA and RC ranked sugar products as number 4 with respect to the comparative advantage. The analysis showing that the (Exports/Imports)% is the dominant criteria in ranking the agro-food groups according to the competitiveness and that RC is the most sensitive index, particularly when we go gradually down to the agro-food groups with smaller and smaller export values. Therefore, it looks reasonable, to see dairy products (Exports/Imports) of about 18% comes number 5 followed by cereals of (Exports/Imports)% around 5%, where RTA, as it gives more importance to the volume of exports, ranked them in an opposite order.

The best -fitted ARIMA model applied for Egyptian Fruits and Vegetables Exports was (0, 1, 1). Forecasting results implies that the comparative export advantage of Egyptian Fruits and Vegetables to the world market seems to decrease over the forthcoming decade. The best-fitted ARIMA model applied for Egyptian Textile and Fiber Exports was (0, 0, 1). Forecasting results implies that the comparative export advantage of Egyptian textiles and fiber crops to the world market seems to decrease over the forthcoming decade. The best-fitted ARIMA model applied for Egyptian Sugars and Honey exports was (1, 1, 2). Forecasting results implies that the comparative export advantage of Egypt in Sugar and Honey (Sugar processed products) to the world market seems to increase slightly over the forthcoming decade, with moderate fluctuations

INTRODUCTION

As the globalization Era has recently enveloped all world countries, the domestic market of each country has also been strongly amalgamated into the international market. Accordingly, the implications of the international trade on the domestic agricultural trade of each country have strongly emerged. The deepness of amalgamation and interaction would mainly depend upon the trade pattern of that country. These patterns were subject to the influence of domestic as well as international trade policies and factors directly related to crops and the production of goods that could affect the trade of agricultural products.

Investigation of, to how extent the Egyptian agricultural sector has a greater or lower share in total agricultural exports than they have in the world as a whole, is the major performance of such amalgamation and interaction. It is measured, directly, by using the indices of the competitiveness of the Egyptian agricultural exports, or indirectly using some other trade performance indicators. The review of the Egyptian literature on agricultural trade competitiveness showed that several indices were applied on various agricultural exportable commodities. The applied indices for measuring the Egyptian agricultural trade competitiveness were:

(1) The Revealed Comparative Advantage "RCA"

(2) The Price Competitive Position "PCP". Some other studies used simpler indicators for measuring the competitiveness of the Egyptian agricultural exports. Those indicators were:

(3) The Market Penetration Rate "MPR",

(4) the market share "MSH",

(5) The price and/or quantity stability rate (STR),

(6) The geographic Centralization of exports (GCE),

(7) The Export price ratio of Egypt to competitors 'price. The studies focused on the major exported food commodities. These were vegetables and fruits subsector, rice, and Egyptian long-staple cotton.

With respect to the RCA, Soliman and Gaber, (2004) studied Potatoes, Orange, and Onion for the period 1990-2000 and Estimated RCA of about 38.6 for potatoes, 22.5 for cotton, 14.4 for onion, 13.0 for oranges, 12.8 for rice. The constraints to expand vegetables and orange exports were the EU barriers, particularly the quota system and limited allowed season. Spite of the high comparative advantage of the Egyptian rice and cotton in the international market, the lack of a rational foreign trade and marketing policies of Egypt, limited the expansion in their exports.

Soliman, and Moussa, (2004) investigated the RCA of cereals, rice, onions, beans, oranges, and cotton for the period 1996-2000. They concluded that Egypt enjoyed a comparative advantage in exports of cereals (219), rice (11.14), onions (11.06), beans (3.34), and oranges (21.6), and cotton (15.25).

In more recent studies Fayyad, and Abdul -Hady, (2005) focused on measuring the revealed comparative advantage of the Egyptian potato exports to the EU markets during the period 1992-2003 showing that it had a decreasing trend due to absence of efficient export plan for potatoes to the EU markets, in addition to bad packaging, and the incidence of certain diseases.

Baghdadi, and Sabry, (2009) studied the food processing sector represented by Jams, Marmalades, Peeled fruits, and juices within (1996-2008). They showed that Egypt has relatively low RCA of (2.18) for (jam, marmalades, and compote) and (1.29) for juices. They concluded that vegetables and fruits processing sector requires development of a modern quality and specification systems.

Dawoud, (2010) studied Rice, Potatoes, Onion, Orange, Grapes in the years 994-2007. She showed that to expand the export competitiveness of rice to the Belgian and Spanish markets, oranges to the Holland and Irish markets, and grapes to the United Kingdom and Holland market, would require Improving the quality to meet the European standards.

The studies applied the simpler indicator of the Price Competitive Position (PCP). Soliman and Gaber, (2004) in their study on Potatoes, Orange, and Onion in the period 1990-2000 concluded that Egyptian potato's export price was less than that of USA, Holland, Spain, France, and

Canada. Both Egyptian orange and onion export price were less than all competitors. Such distinguished price competitive position was due to less costs of production, costs of transportation and trade agreements.

Mekled, et al. (2007) was almost the unique study on Flowers and Ornamentals exports for the period 1991- 2005. They concluded that Egypt enjoyed competitive price position in flowers and ornamentals compared with France, Italy, and Kenya.

Baghdadi, and Sabry, (2009) measured the PCP for jams, marmalades, peeled fruits, and juices in the years 1996-2008. They cited that Egypt enjoyed competitive price position in exporting jam, marmalades, and peeled fruits compared to France, Germany, Turkey, and Belgium, and in juices exports compared to Belgium and the Netherlands. Therefore, Exports Development requires Appling the quality and specifications.

Hassan, et al. (2009) focused in their study on Egypt rice exports over the period 1990- 2007. They provided evidences that Egypt had Price competitiveness in exporting rice to USA, Italy, Australia, Pakistan, and India. Moreover, it did not have that compared to Vietnam and China. The study of El -Abbacy, et al. (2009) on cotton in 2000-2007, showed that Egypt enjoyed price competitive position in exporting Egyptian cotton compared to the American cotton (Pima), but the (PCP) Egyptian cotton, was falling annually. This was because of mixing the Egyptian cotton during harvesting or ginning, high cotton production cost, and the instability of the marketing and price policy of exports.

Abu -Hatab, (2009) studied Egyptian cotton exports in 1990-2006. He showed that the average ratio of Egyptian export price to export prices of its major competitors in international markets was 2.60 in the Argentinean market and 1.8 in the American, Australian, and Uzbek markets, due to better quality. However, Egyptian cotton maintained its status in international markets despite low prices of the competing cottons, due to Egypt's commitment to a set of obligations under the international and regional economic blocs, with an increase in the demand for Egyptian cotton. Hassan, et al. (2010) in their study on Oranges within the period 2001 -2009, postulated that Egypt had the advantage of competitive export price of orange in comparison with Spain, Israel, Morocco, Italy, and Turkey, as their prices were 1.48, 1.27, 1.25, 1.06, 1.05 of the Egyptian price, respectively.

The results of the recent study of Dawoud, (2010) on Rice, Potatoes, Onion, Orange, and Grapes in (1994-2007) Egyptian rice exports had price competitive position, compared to Italy, for potatoes, Italy and Holland, for rice and oranges, Spain and South Africa for Onion, USA, France, and China for grapes, Morocco and Spain for orange. Egyptian exports enjoyed cheaper prices to competitors in Indian market for rice in Germany market for potatoes and grapes in Syrian market.

The instability in the exported Potatoes, Orange, Onion to EU was the highest in the quantities of potatoes (45%) and onion (41%)and the lowest in orange (17%). The same performance was observed with price instability, where it was more than 40% for potatoes and onion and around 32% for orange in the period (1990-2000), (Soliman and Gaber, 2004).

Baghdadi, and Sabry, (2009) studied the jams, marmalades, Peeled fruits, and juices exports in (1996-2008). They cited that while there was a significant degree of instability in the value and quantity of Egyptian exports of processed food products the export price was the most stable, in all years of study. They cited that the external demand for these products was affected by factors other than price. These factors should be identified for continuity of the Egyptian exports.

Hassan, et al., (2009) on their Rice exports stability over the period 1990-2007 found that while the Egyptian rice quantities exported were unstable over the studied period, (the instability coefficient, was 31.4%), its price was more stable (the instability coefficient was 5%).

Abu Hatab, (2009) investigated the Egyptian cotton stability over the period (1990-2006). The study cited that the instability coefficient of Egyptian cotton over the period (1990-2006) had dropped over time in the Turkish, Thai, Indian, Italian, Korean and Japanese markets. There was a positive significant effect of the WTO on cotton exports.

Egypt has attempted to find a firm destination for its agricultural exports facing a fierce

competition under the reform policy of Egyptian foreign agricultural trade, via adoption of modern techniques of production, usage of new varieties and working on achieving high quality required in the international markets. While there was instability in the quantity and value of the Egyptian exports of rice and Potatoes it was not in onion and oranges in the year 1994-2007. However, the export prices showed a moderate degree of stability, (Dawoud, 2010)

The last decade, a set of studies applied the Market Penetration Rate (MPR) to measure the competitiveness of Egypt's exports in the international markt.

Fayyad, and Abdul-Hady, (2005) on potatoes over the period (1992-2003) founded fluctuations in penetrating the EU markets where the penetration rate ranged between 53% and 83%, due to strong competition from EU countries (Netherlands, Belgium, Spain) and non-EU (Turkey, Canada, USA, Morocco, Israel).

Hassan, et al., (2009) on rice over the period (1990-2007) detected the highest penetration value achieved in the Sudanese and Romania markets the annual average reached 72%. It was low in Turkish, Lebanese, and Saudi markets, due to fierce competition with Egyptian exports in those markets. Egypt has to Strive towards lowering its rice export price in those markets to increase the penetration rate.

El-Abbacy, et al, (2009) focused on cotton over the period (2000-2007). They measured the access of the Egyptian cotton to penetrate foreign markets It reached its highest value (5%) in the Italian market. The lowest value was (.07%) in the Chinese market. Low penetration rate was due to the mixing of Egyptian cotton varieties during harvesting or ginning, high cotton production cost, and instability of the marketing and price policy.

For the same crop, Abu Hatab, (2009) compared the values of market share index with the market penetration index within the last decade. He found that the Indian market ranked first in terms of Egyptian cotton market share, whereas it ranked fifth using the market penetration index. 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 reflected the possibility of increasing Egyptian cotton Exports 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, which indicated the difficulty in increasing the Egyptian cotton Exports into the Italian market.

Grapes penetration rate was studied by Salem, et al. (2010). They showed that the penetration rate of the Egyptian grapes exports reached its highest value in the Netherland Market (3.6%), followed by the UAE, Belgian, and British markets. It reached the lowest penetration value in the German market (0.2%). The high rate of penetration to the UAE, Netherlands, Belgium and England was due to re-export of some quantities imported.

.Studies on the Geographic Centralization of Egyptian agricultural exports over the period 1988-2007, showed that while Egypt occupied the fifth rank among Arab countries with a GCE 11%, Jordan occupied the first rank of Arab Agricultural Inter-Trade with GCE 24%. Baghdadi, and Sabry, (2009) in their study on jams, marmalade, peeled fruits and juices showed a centralization pattern of Egyptian exports in these products, except juices (85%) to Libya, Japan, Saudi Arabia, Iraq, and USA. While 5% of Egyptian exports of juices, was concentrated to Libya, the United States of America, Yemen, Palestine, and Italy

Over the last decade, a set of Studies adopted the Market Penetration Rate (MPR) to measure the competitiveness of Egypt's exports in the international agricultural market. It is the ratio between a particular country's imports from a specific commodity and its apparent consumption from that commodity. Fayyad, and Abdul-Hady, (2005), on potatoes over the period (1992-2003) found fluctuations in penetrating the EU markets where the penetration rate ranged between 53% and 83%, due to strong competition from EU countries (Netherlands, Belgium, Spain) and non-EU (Turkey, Canada, USA, Morocco, Israel). Hassan, et al. (2009), on rice over the period 91990-2007) detected the highest penetration value achieved in the Sudanese and Romania markets the annual average reached 72%. It was low in Turkish, Lebanese, and Saudi markets, due to fierce completion with Egyptian exports in those markets. Egypt has to Strive towards lowering its rice export price in those markets to increase the penetration rate. El-

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The main objectives of this study are, the analysis of the competitiveness of the Egyptian agricultural exports with respect to the international markets, and ending up with a quantitative outlook for Egyptian Exports using ARIMA model.

DATA BASE AND ANALYTICAL PROCEDURES

The Study used the data available on trade flows of Egypt and the whole world exports and imports of the concerned commodity groups from the Food Organization of the United Nations (FAO). The time series set of the GDP was extracted from the database of the Egyptian Ministry of Economic development. The exchange rate of EGP (Egyptian pound)/US$ was derived from the bulletin of the Egyptian Central Bank and (www.Xe, the World favorite Currency Site, 2010).

Analysis of Comparative Advantage

The law of comparative advantage refers to the ability of a party (an individual, a firm, or a country) to produce a particular good or service at a lower opportunity cost than another party. It is the ability to produce a product with the highest relative efficiency, given all other producible products. Comparative advantage explains how trade can create value for both parties even when one can produce all goods with fewer resources than the other can. The net benefits of such an outcome are called gains from trade. It is the main concept of the pure theory of international trade, (Chang, Ha-Joon, 2002) and (Chang, Ha-Joon, 2008).

If the classical Revealed Comparative Advantage (RCA) Index, (Equation 1) formulated by Balassa (1965), is greater than one indicates a comparative advantage and if RCA <1 depicts a comparative disadvantage However, Vollarth, (1987; 1989) examined trends of international competitiveness in agriculture, basing the analysis upon a concept called Revealed competitiveness advantage using other global trade intensity measures than RCA. “Vollarth” identified (RCA) for exports as Relative Export advantage (RXA), (Equation 2). The counterpart of RXA is the Relative Import Advantage Index (RMA), (Equation 3). The Logarithm of the Revealed export advantage Ln(RXA) identifies the relative export advantage (Equation 4). The Logarithm of the Relative export advantage [Ln (RXA)] is the unambiguous economic interpretation of Revealed comparative advantage (RCA) as being equivalent to deviations of actual from expected trade. Ln(RXA) may be preferable than RCA because the former is less susceptible to “policy induced distortions”.

The Relative Trade Advantage (RTA) considers both exports and imports relative advantages, (Equation 5). RTA is adhering more closely to actual comparative advantage than Ln (RXA) when abstracting from distortion influence. Importance of RTA stems from using export

and import data, and therefore, embodies both the relative demand and relative supply dimensions (Benedictis, and Tamberi, 2001).

The Revealed Competitiveness (RC), (Equation 6) considers the logarithm of both the relative export advantage and the relative import advantage. Although Both, RTA and RC consist with the real world economic phenomenon of two ways trade, RC is preferable to RTA at high levels of commodity aggregation. In this case, RC balances the supply and demand dimensions of comparative advantage equally. Nevertheless, RTA index is preferable than RC at low levels of commodity aggregation, and when either the exports or imports of a commodity is not exist. Precisely, the RC should not be used when there are small values of exports and imports of the specified commodity, or in the case of no imports as RC would not be identified or when there is no exports, it equals to zero, (Serin & Civan, 2008).

As with Balassa's Relative export share definition of revealed comparative advantage (RCA), the other three revealed- Competitiveness Advantage indices, also differentiate countries that enjoy a relative advantage in a particular commodity from those that do not. Whereas, positive RTA, Ln (RXA) and RC reveal a comparative advantage a negative value reveals a comparative disadvantage.

Eliminating country and commodity double counting in world trade from all indices make clear distinction between a specific commodity and all other commodities and between a specific country and the rest of the world (Chang, Ha-Joon, (2002, 2008).

To wrap up, RTA index is preferable than RC in two cases: (a) At low levels of commodity aggregation, (b) RTA does not require a country existence of exporting and importing the same commodity. This is because RTA weights the Revealed Comparative Advantage by the relative importance of RXA and RTA. Therefore, The RTA behavioral patterns are not dominant by extremely small export or import values of the specific commodity.

Equation 1 $$RCA = (X_{ij}/X_{it})/(X_{nj}/X_{nt})$$

Equation 2 **RXA = RCA**

Equation3 $$RMA = (M_{ij}/M_{it})/(M_{nj}/M_{nt})$$

Equation 4 **Ln (RXA) = Ln (RCA)**

Equation 5 $$RTA = RXA - RMA$$

Equation 6 $$RC = \ln RXA - \ln RMA$$

Where:

X represents exports value in (000) US$, M represents imports value in (000) US$, i is the specified country (Egypt),

j is the specified commodity,

t is the total set of commodities exports, minus commodity J n is a set of comparable Market(s); (World), minus county i

Then:

Xij = Exports value in (000) US$ of Commodity j of Egypt

Xit = Exports value of the total set of commodities exports from Egypt minus the

specified commodity

Xnj = Exports value of the specified commodity of the World market

Xnt = value of the total set of commodities exports minus the specified commodity export in the world market

Forecasting Model for Performance of Egyptian Agricultural Exports

To approach the study's objective on a quantitative outlook of agricultural markets for the next decades, a time series model was generated in order to predict future points in the series. It was the (Autoregressive Integrated Moving Average (ARIMA) model..

Concepts of ARIMA Method

Box and Jenkins (BJ) introduced Autoregressive Integrated Moving Average (ARIMA) model. Therefore, it is also known as "Box Jenkins Model" for forecasting a variable. It is an extrapolation method for forecasting. Therefore, it requires the historical time series data on the variable under forecasting. It incorporates the features of all other methods. However, it does not require from the investigator a priori choice for the initial values of any variable or the values of various parameters. It is robust to handle any data pattern (*Abraham and Ledolter, 1983*).

Among the extrapolation methods, this one is of the most sophisticated method as such model involves transformation of the variable, identification of the model, estimation through non-linear method, verification of the model and derivation of forecasts. However, there are many reasons why an ARIMA model is superior to common time–series analysis and multivariate regressions (*Box and McGregor, 1974)*

The common problem in time series analysis and multivariate regression is that the error residuals are correlated with their own lagged values (*Chatfield, 1996*). This serial correlation violates the standard assumption of the regression model. Nevertheless, that disturbances are not correlated with other disturbances. Therefore, the regression analysis and basic time series analysis are no longer efficient among different linear estimations. As the error residuals helps to predict current error residuals, it is an advantage to form a better prediction of the dependent variable using ARIMA. If there are, lagged dependent variables set as explanatory variables; regression estimates are biased and inconsistent but can be fixed using ARIMA (*Box and Reinsel, 1994*). Moreover, ARIMA model takes into account the seasonality of the data.

In words, the ARIMA procedure analyzes and forecasts equally spaced unvaried time series data, transfer function data and intervention data, using the Autoregressive Integrated Moving-Average, (ARMA) model (*Makradakis,, Wheel wright and McGhee, 1983)*).

ARIMA Model

An "ARIMA" model predicts a value in a response time series as a linear combination of its own past values, past errors (also called shocks or innovations), and current and past values of other time series, (Judge, et al, 1985). Then regressors X1 X2 X3 explain a difference between regression models in which Yi …. X_k, and time series as type of "BJ" models is that regressors can be explained by lagged values, and the stochastic error terms (*Gujarati, 2004)*

The time series models are analyzed based on the assumption that the time series considered are weak stationary. Therefore, the noise (or residual) series for an ARMA model must be stationary. Both the expected values of the series and its auto-covariance function must be independent of time. In short, the mean and variance for a weakly stationary time series are constant and their covariance is invariant. However, it is known that many economic time series are not stationary (*Nelson, 1973)*, i.e. they are integrated (if a time series is integrated of order 1, then their first differences (0)" i.e. stationary, (*Brockwell, et al,. 2002)*. Therefore, to differentiate a time series "d" times to make it stationary and then apply the model ARMA (p, q), you can say that the original time series is ARIMA (p, d, q), (*Chatfield, 1996*). The (Equation 7) usually denotes the order of an ARIMA model

Equation 7 **ARIMA (p, d, q),**

Where:

p = the order of the autoregressive

part d = the order of the differencing

q = the order of the moving-average process

If no differentiations are done (d = 0), the models are usually referred to as (Equation 8)

Equation 8 **ARMA (p, q)**

Since the IDENTIFY statement specified d = 1, and the final estimate statement specified p= 1 and q = 1, the model to be used in analysis of the time series of RCA Index for the Egyptian Agricultural Export products is; (Equation 9Equation)

Equation 9 **ARIMA (1, 1, 1)**

The method proposed by "Box and Jenkins" is customarily partitioned in three stages: *identification*, *estimation* and *diagnostic checking*. At the identification stage, a tentative ARIMA model is specified for the data generating process based on the autocorrelation p_k and partial autocorrelation. For a given sample $y_{1...} y_t$, the former can be estimated by (Equation 10)

Equation 10 $p_k =$ $\frac{\sum_{t=k+1}^{T}(y_t - \bar{y})(y_{t-k} - \bar{y})}{\sum_{t=1}^{T}(y_t - \bar{y})^2}$

Where:

$\bar{y}$ = the sample mean.

An alternative, asymptotically equivalent estimate for p_k is (Equation 11).

Equation 11 $\hat{r}_K = \frac{T}{T-K} r_K$

An estimate of the kth partial autocorrelation coefficient ψkk can be obtained by using the Yule-Walker equations. Alternatively, ψ_{kk} can be estimated by LS using the linear model (Equation 12), (*Brockwell, and Davis, 2002*).

Equation 12 $y_t^* = \psi_{k1}\, y^*_{t-1} + \ldots\ldots\ldots + \psi kk\, y^*t\text{-}k + v_t$

Where: $y_t^* = y_t - \bar{y}$.

To identify integer's p, d, q the following result can be used:

1 If the autocorrelation do not die out rapidly, this indicates non-stationary and differentiating (usually not more than once or twice) and it is suggested until stationary is obtained. Then an ARMA model is identified for differentiating the series

2 For an MA (q) process, the autocorrelation pk = 0 for k > q and the partial autocorrelation taper off.

3 For an AR (p), the partial autocorrelation $\psi_{kk} = 0$ for k > p and the autocorrelations taper off.

2 If neither the autocorrelations nor the partial autocorrelations have a cutoff point, an ARMA model may be adequate. The AR and MA degree have to be inferred from the particular pattern of the autocorrelations and partial autocorrelations.

Once the orders of tentative model are specified, its parameters can be estimated. Finally the adequacy of the model may be checked for example by analyzing the residuals or by over fitting the obtained model (*Abraham, 1983*).

RESULTS AND DISCUSSION

Role Agriculture in Egyptian Economy

Table 1 shows that The annual average share of agriculture in the Egyptian GDP was 16%., in the total exports was 9%, and in total imports was 19% along the period (1995-2008).

While total exports covered 47% of the Egyptian imports, the agricultural exports covered only 22%, as an annual average of the same period. The agricultural share in total exports decreased from 11% in 1995 to around 7% in 2008. While the total imports covered 47% of the total imports, the agricultural exports covered only 22% of the agricultural imports, as an annual average of the period (1995-2008).

The Analysis of the Egypt Comparative Advantages in Agricultural Trade

The Analysis of The Egypt Comparative Advantages has dealt with the agricultural exports of the major commodity groups: Meat and meat preparations, Dairy products and bird eggs, Cereals and cereals preparations, Vegetables and Fruits, Sugar, sugar preparations and honey, Feeding stuff of animals, Beverages, Tobacco, Oils and fats, and Textile fiber and their wastes.

If the Relative Export Advantage (RCA) Index of a certain commodity group is greater than one and/or other competitiveness indices are of positive value, then Egypt has a comparative (competitiveness) advantage in such group of agricultural products. If RCA <1,and/ or other indices are of negative values, indicate that Egypt has disadvantage in exporting such commodity group to the world market. Results of estimated indices are presented in (Table 2 up to Table 11). In lights of the criteria of RCA there are only four agricultural products groups out of ten, where Egypt has competitiveness (comparative) advantage in the world market. These four groups are Textile and Fibers, Fruits and Vegetables, Cereals and cereal preparations and Sugar and honey.

Surprisingly, that Egypt is net importer of sugar cane, while there is a revealed competitiveness in exports of such group to the world market (Table 6), where the RCA ranged from 1 to 2.5. However, the astonishment will disappear fast, when we know that all sugar products exports from Egypt are under Sugar Confectionery and no exports of real pure sugar, (*Soliman and Mashhour,2000*). Furthermore, the competitiveness of such group in the world market was not in all years of the concerned time series. It was only over nine years (2000-2008).

Similarly, the cereals and cereal preparation group has shown a competitiveness overall the concerned period, but two years which were 1995 and 2008 (Table 4). However, Egypt was the largest importer of wheat in the world over the last decade. In addition Egypt import large amount of corn for poultry and livestock feeding. Nevertheless, the competitiveness advantage of Egypt in cereals export implies the impact of the comparative advantage of Egypt in rice export (*Soliman, et al., 2003).*

On the other hand, the analysis showed that Egypt has extraordinary high competitiveness in other two agricultural products groups. These are textile, fiber crops group and fruits, and Vegetables group. The RCA ranged from 6 to 28 for textile and fiber crops and from 1.5 to 7 for fruits and Vegetables, respectively. The main textile and fiber crops for export is the Egyptian cotton (Soliman and Owaida, 2005) and the main exported fruits and vegetables are oranges, potatoes, tomatoes and onion (Soliman and Gaber, 2004).

Ln(RXA) index which reflects the relative export advantage, showed positive value in the comparable years that showed RCA value greater than one. Therefore, the two indices are comparable concerning the studied agro-food groups. As shown in the analytical procedure that the Ln(RXA)] is preferable than RCA because the former is less susceptible to “policy induced distortions, the results would imply that there was no policy distortions influence on all commodity groups or the impact of such policy distortions was the same on all groups.

The Relative Trade Advantage (RTA) and the Revealed Competitiveness (RC) coincide with

the RCA results with respect to Meat group, dairy products group, fodder and feeds group and tobacco i.e. while RTA and RC had negative value, RCA has values less than one for all studied year. It means that the three competitiveness indices showed that these agro- food groups had comparative disadvantage within the period (1995-2008). Whereas, the fruits and vegetables group, textile and fiber crops group had positive values of RTA and RC for all yeas, RCA had values greater than one. This results means that in the period (1995-2008) the three indices showed also coincide conclusion, which was that Egyptian economy had performed a sort of competitiveness in these agro-food groups.

However, the analysis of vegetal oils and animal fats group as well as the beverages group had shown the role of RTA and RC in sharing up the sensitivity of the two sides flow of trade (exports and import) when determining the competitiveness of Egypt in exporting these products, comparing with RCA. With respect to oils and fats group, RTA and RC values had shifted typically with RCA along the period 1995-2001. When the values of RCA were less than one (1995-2001) RTA and RC indices had negative values showing comparative disadvantage. However, the RCA in years 2003, 2006, 2007 and 2008 continued with values less than one indicting a comparative disadvantage of Egypt in oils and animal fats. In two of those four years, i.e. 2003 and 2006 RTA and RC were with positive values showing comparative advantage of Egypt in oils and fats trade. Surprisingly, all the years of the concerned period (1995-2008) RCA values were less than one implying disadvantage of Egypt in exporting beverages. Even though, RTA and RCA showed the opposite results. Their values were high positive, showing competitiveness of Egypt in exporting beverages.

In conclusion, it seems that the sensitivity of the RTA and RC from the adherences of RTA and RC to actual comparative advantage is due to considering the export and import data, and therefore embodies both the relative demand and relative supply dimensions. Thereof, RTA and RC consist with the real world economic phenomenon of two ways trade, i.e. the price and quantity differences of exports and imports. If exports share in the world market surpassed much the imports, either due to the price (quality), or quantity (magnitude), or if both were two small (the case of oils and fats) then the results of RTA and RC would be quite different but more reliable than RCA.

The study tried to provide evidence for such conclusion by ranking the ten agro-food commodity groups by the result of each comparative advantage index in descending order, i.e. from the highest value to the lowest one for only one year (2008). While Table 12, presents the results, Table 13 includes the volume of exports and imports in (000) USD, and the percent of exports coverage to imports. It seems that RC gives the most reliable results, as it considered the resultant of both values of exports and the percent of imports covered by the exports. Thereof, RC introduced vegetables and fruits to the front of competitiveness of Egypt's exports, as such group showed the highest value of exports and the second order of the (Exports/Imports)%. It was followed by textiles and fiber crops at the second order of the exports value but the first order with respect to (Exports/Imports)%. Although the exports value of beverages group came at the fourth order after cereals and preparations, dairy products and Eggs and sugar products, it surpassed much all of them as (Exports/Imports) %, was around168%, while it was 20%, 18% and 5% for the other three groups. Thereof, both RTA and RC ranked sugar products as number 4 with respect to the comparative advantage. The analysis showing that the (Exports/Imports)% is the dominant criteria in ranking the agro -food crops according to the competitiveness and that RC is the most sensitive index, particularly when we goes gradually down to the agro-food groups with smaller and smaller export values. Therefore, it looks reasonable, to see dairy products of (Exports/Imports)% 185 comes number 5 followed by cereals of (Exports/Imports)% around 5%. As RTA gives more importance only such index ranked them in opposite orders.

In conclusion, the study recommends RC for a developing country like Egypt where the volume of exports is not too high and variation in (Exports/Imports)% is too large.

Forecasting Outlook for Egyptian Agricultural Exports

This section provides a quantitative outlook of agricultural exports for the next decade. For this purpose, a model of time series analysis was generated in order to predict future points in the series. It was (Autoregressive Integrated Moving Average (ARIMA) model. The model was used for selected group of agricultural exportable products. The selection based on the RCA results focusing on such agricultural commodity groups that showed comparative advantage (RCA > 1). The analysis in the previous sections of this study showed that these groups are (Fruits and Vegetables), (Textile and Fibers), (Cereals and Cereal preparations) and (Sugar and Honey). Even though, these four groups showed RCA index >1 associated with Positive coefficient of each of other estimated indices: (Ln RXA), (RTA) and (RC), there was a wide variation of RCA values among these four groups and RCA was not > 1 for cereals for all concerned years (1995-2008).

Forecasting of Egypt competitiveness in Textile and Fibers Exports

The best-fitted ARIMA model applied for Egyptian Textile and Fiber Exports was (0, 0, 1), The model parameters were shown in (Table, 15). The model function was shown in (Equation 13), which was used to forecast the values of the relative advantage index of Egypt for textiles and fiber crops till the year 2018. Forecasted and actual values with confidence limits for textiles and fiber crops are shown in (Table 15) and (Figure 1). Forecasting results implies that the comparative export advantage of Egypt to the world market seems to decrease over the forthcoming decade.

Equation 13 RXA = 15.204 + 0.562 $_{t-1}$

Forecasting of Egypt competitiveness in Fruits and Vegetables Exports

The best-fitted ARIMA model applied for Egyptian Fruits and Vegetables Exports was (0, 1, 1). The model parameters were shown in (Table 16). The model function is shown in (Equation 14), which was used to forecast the values of the relative advantage index for fruits and vegetables exports of Egypt till the year 2018. Forecasted and actual values with confidence limits are shown (Table 17) and (Figure 2). Forecasting results implies that the comparative export advantage of Egypt in Fruits and Vegetables to the world market seem to sharply increase over the forthcoming decade,

Equation 14 RXA= 0.3784 + 1.000 ε_{t-1}

Forecast ARIMA Model for Egypt competitiveness in Cereals and cereal Preparations

The best-fitted ARIMA model applied for Egyptian Cereals and Cereal Preparations exports was (1, 0, 1). The model parameters were shown in (Table 17). The model function was shown in (Equation 14), which was used to forecast the RCA index for Cereals and Cereal Preparations exports of Egypt untill the year 2018. Forecasted and actual values with confidence limits are shown (Table 19) and (Figure 3). Forecasting results implies that the relative export advantage of Egypt in Cereals and Cereal Preparations to the world market seem to increase sharply over the forthcoming decade, mainly rice exports.

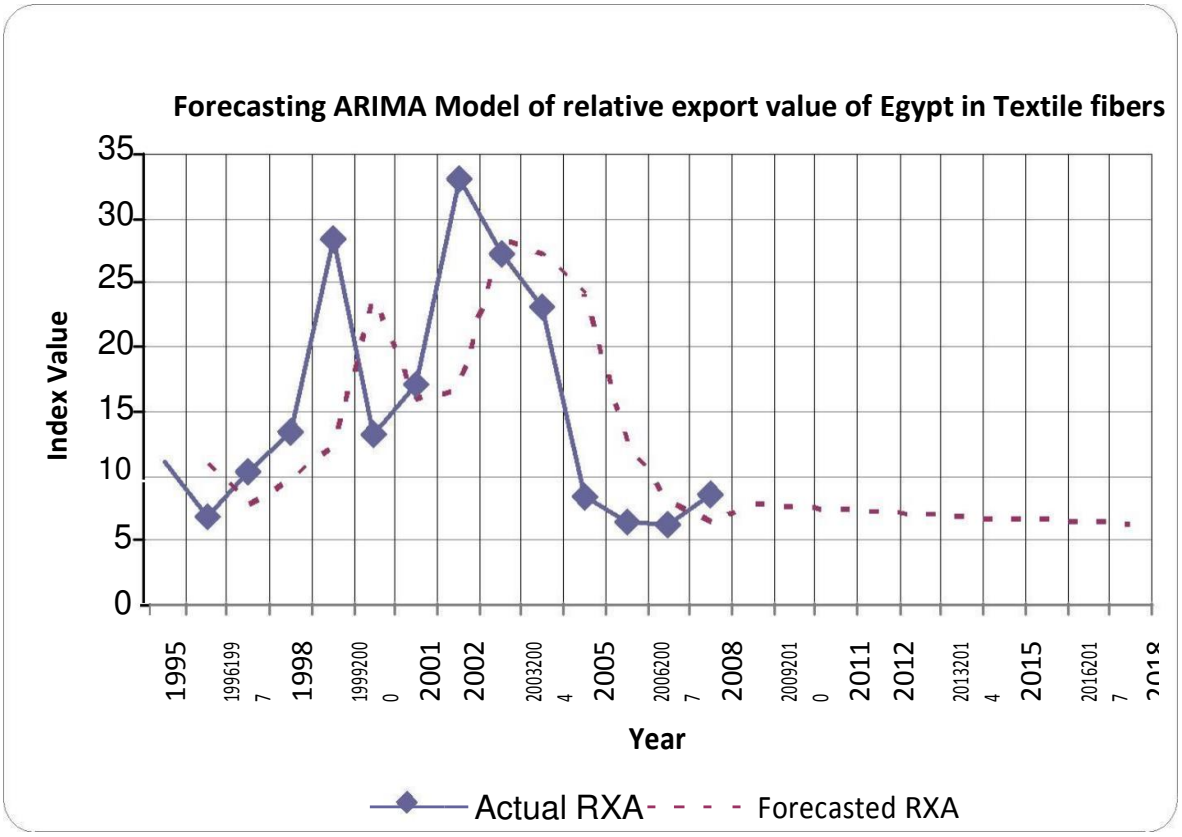
Equation 15 RXA= 1.7312 + 0.2702 RXA_{t-1} – 0.1343 RXA_{t-2} – 0.8051 RXA_{t-3}

Forecasting of Egypt competitiveness in Sugars and Honey

The best-fitted ARIMA model applied for Egyptian Sugars and Honey exports was (1, 1, 2). The model parameters were shown in (Table 19). The model function was shown in (Equation 15), which was used to forecast the values of the relative advantage index for sugar and honey exports of Egypt till the year 2018. Forecasted and actual values with confidence limits are shown in (Table 18) and (Figure 3). Forecasting results implies that the comparative export advantage of Egypt in Sugar and Honey (Sugar processed products) to the world market seems to increase slightly over the forthcoming decade, with moderate fluctuations.

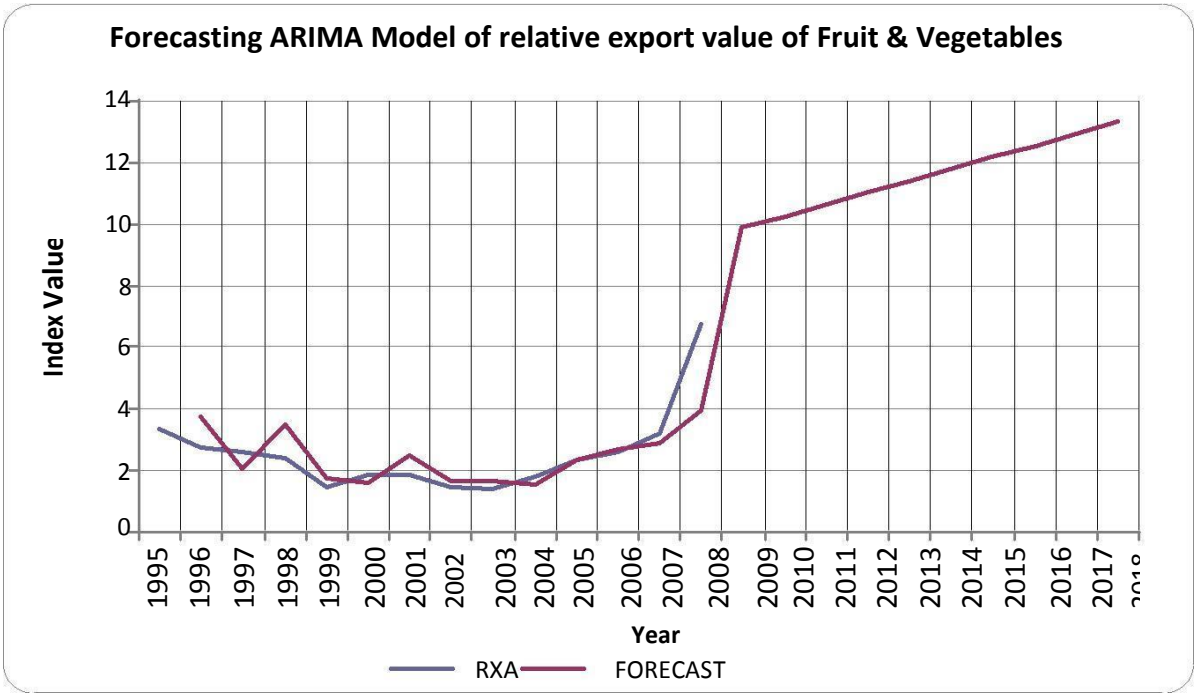
Equation 16 $RXA = 0.0643 - 0{,}8990\ RXA_{t-1} + 1.1555\ _{t-1} + 1.000\ _{t-1}$

Figure 1



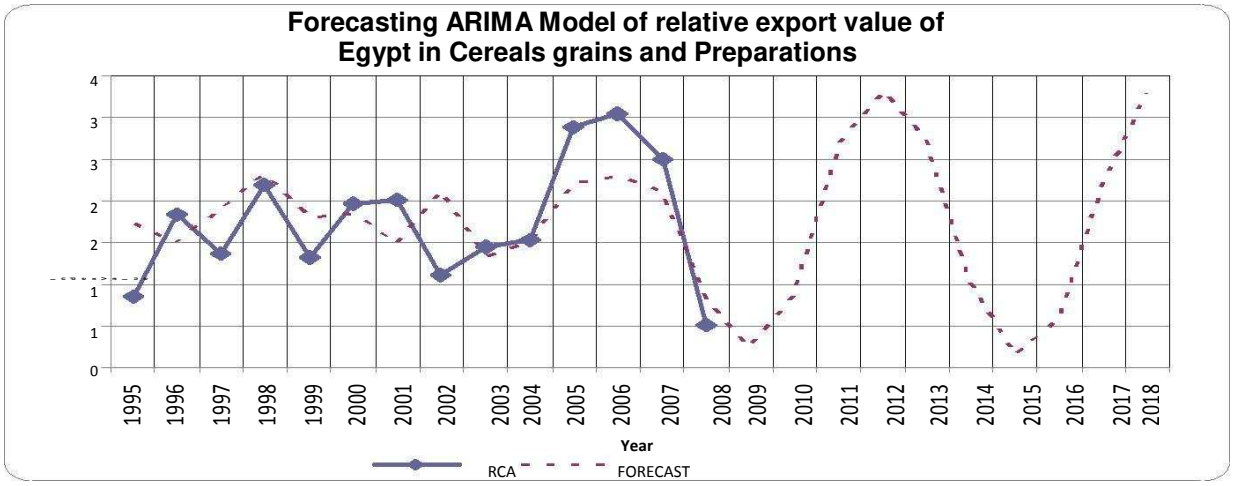
Source: Drawn from (Table 13)

Figure 2



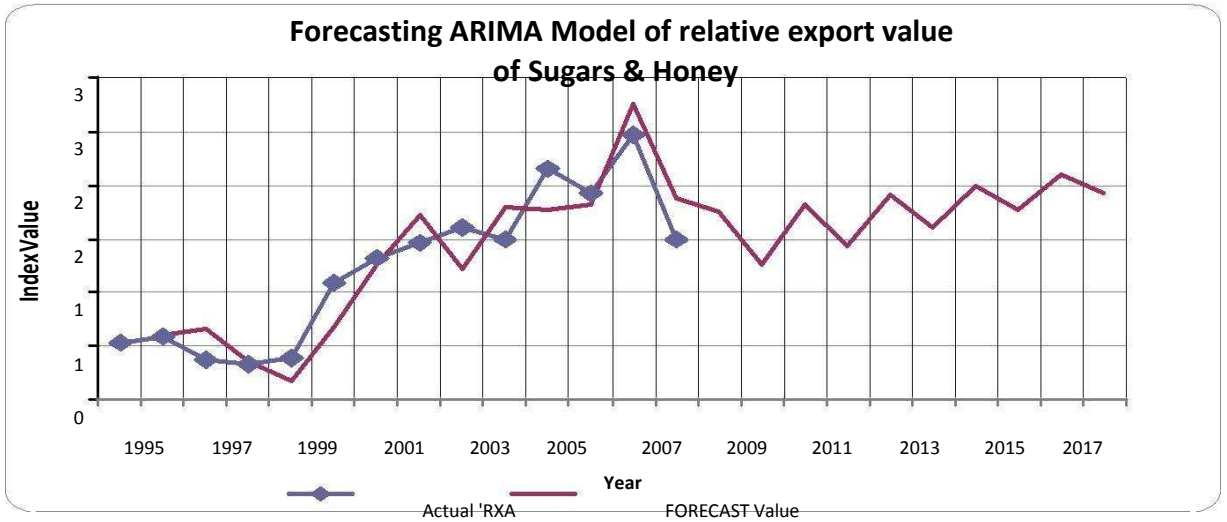
Source: Drawn from (Table 15)

Figure 3



Source: Drawn from (Table 17)

Figure 4



Source: Drawn from (Table 19)

Table 1 Role of Agriculture in Egyptian Economy

Year	Total GDP Million US$(2)	% (agriculture Output)/GDP	Total Exports Million US$ (3)	% (agricultural exports)/ Total	Total Imports Million US$ (3)	% (agricultural imports)/ Total	(Coverage of Exports to Imports)%	
							Total	Agriculture
1995	59749	17%	4957	11%	11739	29%	42%	16%
1996	70896	16%	4609	11%	14107	27%	33%	13%
1997	78684	16%	5345	8%	15565	22%	34%	12%
1998	81063	17%	5128	11%	16899	21%	30%	16%
1999	87463	17%	4445	13%	17008	22%	26%	15%
2000	94492	16%	6388	8%	17861	20%	36%	14%
2001	91371	16%	7068	9%	16441	20%	43%	19%
2002	86049	16%	6643	12%	14644	23%	45%	24%
2003	82548	16%	8205	11%	14821	18%	55%	34%
2004	78171	15%	10453	13%	17975	17%	58%	44%
2005	90682	14%	13833	8%	24193	16%	57%	29%
2006	112254	14%	18455	6%	30441	13%	61%	28%
2007	124324	15%	19224	8%	37100	15%	52%	28%
2008	160,388	16%	26,224	7%	48,382	18%	54%	21%
Annual Average	92,724	16%	10,070	9%	21,227	19%	47%	22%

Source; Compiled and Calculated from:
(1) Egyptian Ministry of Economic Development (2010) "Economic Indicators", http://www.mop.gov.eg/English/map_E.html
(2) The World favorite Currency Site, (2010) <http//www.xe.com/ict/?basecur=USD&historical>
(3) FAO Statistics Division (2011) FAOSTAT, January 2011
http://faostat.fao.org/site/550/DesktopDefault.aspx?PageID=550
(4) Using (**Erreur ! Source du renvoi introuvable.** Up to Equation 7))

Table 2 Competitiveness of Egypt in Meat and Live Animals Exports

Year	RCA	Ln RXA	RTA	RC
1995	0.106	-2.245	-0.778	-2.122
1996	0.152	-1.884	-0.377	-1.247
1997	0.233	-1.456	-0.436	-1.054
1998	0.129	-2.051	-0.683	-1.843
1999	0.074	-2.609	-0.963	-2.645
2000	0.069	-2.680	-1.057	-2.798
2001	0.089	-2.415	-0.724	-2.208
2002	0.073	-2.616	-0.737	-2.405
2003	0.096	-2.349	-0.566	-1.935
2004	0.096	-2.340	-0.531	-1.873
2005	0.074	-2.608	-0.627	-2.253
2006	0.043	-3.153	-1.109	-3.295
2007	0.040	-3.212	-0.957	-3.209
2008	0.037	-3.308	-0.432	-2.550

Source: Calculated Source; FAO, Food and Agricultural Organization of the United Nations, FAOSTAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor
From, Using (Equation 1 Up to Equation 7)

Table 3 Competitiveness of Egypt in Dairy Products and Eggs Exports

Year	RCA	Ln RXA	RTA	RC
1995	0.072	-2.630	1.589	-2.363
1996	0.118	-2.136	2.418	-1.857
1997	0.161	-1.825	1.026	-1.493
1998	0.106	-2.246	1.324	-1.989
1999	0.418	-0.873	1.705	-0.867
2000	0.166	-1.797	1.570	-1.607
2001	0.131	-2.031	1.141	-1.633
2002	0.231	-1.467	1.911	-0.996
2003	0.365	-1.009	2.545	-0.687
2004	0.281	-1.269	1.758	-0.821
2005	0.528	-0.639	1.932	-0.258
2006	0.495	-0.704	0.495	-0.046
2007	0.389	-0.944	0.389	-0.224
2008	0.724	-0.323	-0.217	-0.262

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAOSTAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 4 Competitiveness of Egypt by Cereals and Cereal Preparations Exports

Year	RCA	Ln RXA	RTA	RC
1995	0.858	-0.154	-3.306	-1.580
1996	1.845	0.613	-2.828	-0.929
1997	1.376	0.319	-2.375	-1.003
1998	2.189	0.783	-1.510	-0.525
1999	1.316	0.274	-2.355	-1.026
2000	1.975	0.680	-1.865	-0.665
2001	2.009	0.697	-2.348	-0.774
2002	1.119	0.113	-3.715	-1.463
2003	1.444	0.367	-3.714	-1.273
2004	1.532	0.426	-2.485	-0.964
2005	2.895	1.063	-2.409	-0.605
2006	3.052	1.116	-1.745	-0.452
2007	2.499	0.916	-3.363	-0.853
2008	0.512	-0.669	-3.475	-2.052

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAOSTAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 5competitiveness of Egypt in Fruits and Vegetables Exports

Year	RCA	Ln RXA	RTA	RC
1995	3.344	1.207	3.091	2.580
1996	2.719	1.000	2.488	2.464
1997	2.600	0.956	2.337	2.290
1998	2.410	0.880	2.146	2.212
1999	1.463	0.381	1.128	1.473
2000	1.858	0.620	1.543	1.775
2001	1.889	0.636	1.507	1.597
2002	1.470	0.386	1.064	1.287
2003	1.430	0.358	1.017	1.242
2004	1.776	0.575	1.360	1.452
2005	2.321	0.842	1.916	1.745
2006	2.585	0.950	2.217	1.948
2007	3.227	1.172	2.898	2.284
2008	6.735	1.907	6.363	2.896

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 6 Revealed comparative advantage of Egypt in Sugar and Honey

Year	RCA	Ln RXA	RTA	RC
1995	0.536	-0.624	-0.996	-1.050
1996	0.593	-0.522	-0.991	-0.982
1997	0.372	-0.990	-2.283	-1.966
1998	0.334	-1.097	-1.809	-1.859
1999	0.382	-0.962	-1.659	-1.676
2000	1.091	0.087	0.520	0.649
2001	1.321	0.279	0.471	0.441
2002	1.465	0.382	0.581	0.505
2003	1.610	0.476	0.848	0.748
2004	1.494	0.402	0.855	0.849
2005	2.146	0.764	1.141	0.758
2006	1.928	0.656	0.991	0.722
2007	2.463	0.901	1.735	1.219
2008	1.492	0.400	0.007	0.005

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 7 Revealed comparative advantage of Egypt in Total Beverages

Year	RCA	Ln RXA	RTA	RC
1995	0.076	-2.581	0.070	2.655
1996	0.051	-2.980	0.048	3.016
1997	0.061	-2.794	0.050	1.694
1998	0.048	-3.041	0.043	2.325
1999	0.032	-3.435	0.029	2.401
2000	0.076	-2.580	0.073	3.236
2001	0.019	-3.944	0.017	2.172
2002	0.025	-3.696	0.023	2.853
2003	0.052	-2.953	0.049	2.939
2004	0.027	-3.610	0.023	1.976
2005	0.039	-3.251	0.037	2.895
2006	0.030	-3.514	0.026	2.169
2007	0.018	-3.994	0.005	0.351
2008	0.098	-2.320	0.086	2.050

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 8 Revealed comparative advantage of Egypt in Total Textile Fibers

Year	RCA	ln RXA	RTA	RC
1995	11.053	2.403	10.641	3.290
1996	6.902	1.932	6.438	2.700
1997	10.330	2.335	10.159	4.102
1998	13.499	2.603	13.320	4.320
1999	28.398	3.346	28.215	5.045
2000	13.232	2.583	13.122	4.789
2001	17.173	2.843	16.872	4.044
2002	33.036	3.498	32.880	5.362
2003	27.193	3.303	26.863	4.412
2004	23.182	3.143	21.839	2.848
2005	8.312	2.118	7.671	2.562
2006	6.477	1.868	5.643	2.050
2007	6.142	1.815	5.437	2.165
2008	8.649	2.157	7.568	2.080

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

.Table 9 Competitiveness of Egypt in Tobacco Exports

year	RCA	ln RXA	RTA	RC
1995	0.012	-4.399	-0.927	-4.337
1996	0.007	-4.953	-0.962	-4.922
1997	0.001	-6.764	-0.952	-6.717
1998	0.001	-6.907	-1.302	-7.172
1999	0.026	-3.637	-1.284	-3.907
2000	0.182	-1.706	-1.380	-2.152
2001	0.105	-2.257	-1.326	-2.615
2002	0.011	-4.554	-1.339	-4.853
2003	0.026	-3.648	-1.586	-4.125
2004	0.003	-5.698	-1.802	-6.289
2005	0.007	-4.972	-1.058	-5.034
2006	0.088	-2.429	-1.288	-2.748
2007	0.007	-5.000	-1.206	-5.193
2008	0.006	-5.136	-1.081	-5.219

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 10 Competitiveness of Egypt in total Fodder & Feeding stuff Exports

Year	RCA	Ln RXA	RTA	RC
1995	0.454	-0.789	-0.478	-0.718
1996	0.357	-1.030	-0.781	-1.159
1997	0.544	-0.608	-0.850	-0.941
1998	0.217	-1.530	-1.390	-2.004
1999	0.206	-1.582	-1.244	-1.953
2000	0.132	-2.026	-1.807	-2.688
2001	0.026	-3.645	-2.220	-4.454
2002	0.028	-3.593	-2.127	-4.361
2003	0.017	-4.059	-2.533	-4.995
2004	0.122	-2.107	-2.152	-2.928
2005	0.157	-1.854	-1.225	-2.177
2006	0.091	-2.400	-0.872	-2.362
2007	0.110	-2.204	-0.922	-2.236
2008	0.077	-2.558	-0.326	-1.650

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (equation Up to **Erreur ! Source du renvoi introuvable.**)

Table 11 Competitiveness of Egypt in Vegetal and animal Oils Exports

Year	RCA	Ln RXA	RTA	RC
1995	0.083	-2.487	-1.824	-3.133
1996	0.103	-2.273	-1.812	-2.923
1997	0.567	-0.568	-1.844	-1.448
1998	0.005	-5.222	-3.379	-6.441
1999	0.018	-4.011	-1.718	-4.563
2000	0.017	-4.099	-0.703	-3.770
2001	0.020	-3.895	-0.167	-2.218
2002	NA	NA	-0.084	2.480
2003	0.008	-4.839	0.002	0.290
2004	NA	NA	-0.017	4.082
2005	NA		-0.081	2.517
2006	0.075	-2.584	0.059	1.542
2007	0.004	-5.431	-0.003	-0.543
2008	0.005	-5.333	-0.016	-1.477

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 12Ranking of Egyptian Exportable Agro-Food Group By the Used Competitiveness Index in 2008

Rank	Agro-Food Group	Rank	Agro-Food Group	Rank	Agro-Food Group	Rank	Agro-Food Group
1	Textile Fibers	1	Textile Fibers	1	Textile Fibers	1	Fruits and Vegetables
2	Fruits and Vegetables	2	Fruits and Vegetables	2	Fruits and Vegetables	2	Textile Fibers
3	Sugar and Honey	3	Sugar and Honey	3	Beverages	3	Beverages
4	Dairy Products and Eggs	4	Dairy Products and Eggs	4	Sugar and Honey	4	Sugar and Honey
5	Cereals and Cereal Preparations	5	Cereals and Cereal Preparations	5	Vegetal and animal Oils	5	Dairy Products and Eggs Exports
6	Beverages	6	Beverages	6	Dairy Products and Eggs Exports	6	Vegetal and animal Oils
7	Fodder & Feeding stuff	7	Fodder & Feeding stuff	7	Fodder & Feeding stuff	7	Fodder & Feeding stuff
8	Meat and Live Animals	8	Meat and Live Animals	8	Meat and Live Animals	8	Cereals and Cereal Preparations
9	Tobacco	9	Tobacco	9	Tobacco Exports	9	Meat and Live Animals
10	Vegetal and animal Oils	10	Vegetal and animal Oils	10	Cereals and Cereal Preparations	10	Tobacco Exports
INDEX	RCA		LnRXA		RTA		RC

Table 13 Share of Exportable Egyptian Agro-Food Group in World's Trade and (Exports/Imports) % in 2008

Commodity Group	Exports (000) US$	% of World	Imports(000) US$	% of World	(Exports/ Imports)%
Textile & Fibers Crops	219,984	1.527%	52,626	0.339%	418.014%
Fruits and Vegetables	1,016,856	0.610%	572,053	0.320%	177.756%
Beverages	14868	0.020%	8855	0.011%	167.905%
Sugar and Honey	80,320	0.250%	399725	1.130%	20.094%
Dairy Products and Eggs	86,015	0.13%	486,199	0.73%	17.691%
Cereals and Preparations	177,197	0.24%	3,587,431	2.12%	4.939%
Fodders & Feeds	5,858	0.023%	132,463	0.679%	4.422%
Meat & Live animals	8,138	0.006%	378,308	0.540%	2.151%
Oils and Fats	128	0.008%	9,992	0.607%	1.281%
Tobacco	347	0.001%	295050	0.843%	0.118%

Source: Compiled and Calculated from: Agricultural Organization of the United Nations, FAOSTAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor

Table 14 Estimated Parameters of Relative Export Advantage Index of Egypt in Textile Fibers

Variable	Estimated Coefficient	Standard Error	T -value	Pr > l t l
MA0,1	-0.562	0.2404	-2.34	0.0376
MU	15.204	3.2662	4.65	0.0006

Source: Calculated from Source; FAO, Food and Agricultural Organization of the United Nations, FAO STAT, TRADE, TRADE STAT, CROPS and LIVESTOCK PRODUCTS, http://faostat.fao.org/site/535/default.aspx#ancor, Using (Equation 1 Up to Equation 7)

Table 15 Forecasts for the Export Comparative Advantage Index of Egypt in Textiles and Fiber Crops

Year	Actual RXA	Forecasted RXA	Slandered Error	95% Confidence limits		RESIDUAL
				Minimum	Maximum	
1995	11.05		9.509	-7.775	29.500	
1996	6.90	10.86	9.509	-10.832	26.443	-3.960
1997	10.33	7.81	9.509	-9.196	28.079	2.524
1998	13.50	9.44	9.509	-6.451	30.824	4.058
1999	28.40	12.19	9.509	5.089	42.364	16.212
2000	13.23	23.73	9.509	-2.696	34.580	-10.495
2001	17.17	15.94	9.509	-1.996	35.280	1.231
2002	33.04	16.64	9.509	9.675	46.951	16.393
2003	27.19	28.31	9.509	8.674	45.950	-1.120
2004	23.18	27.31	9.509	5.495	42.770	-4.130
2005	8.31	24.13	9.509	-6.143	31.132	-15.821
2006	6.48	12.49	9.509	-10.688	26.587	-6.018
2007	6.14	7.95	9.509	-12.187	25.089	-1.807
2008	8.65	6.45	9.509	-10.787	26.488	2.1977
2009		7.85	9.509	-7.775	29.500	-3.960
2010		7.66	11.737	-15.345	30.665	
2011		7.47	13.605	-19.197	34.135	
2012		7.28	15.246	-22.604	37.161	
2013		7.09	16.727	-25.697	39.872	
2014		6.90	18.087	-28.553	42.346	
2015		6.71	19.351	-31.222	44.634	
2016		6.52	20.538	-33.739	46.770	
2017		6.32	21.660	-36.128	48.778	
2018		6.13	22.727	-38.409	50.677	

Source: Estimated using (Equation 13)

Table 16 Estimated Parameters of Relative Export Advantage Index of Egypt in Fruits and vegetables

Variable	Estimated Coefficient	Standard Error	T -value	Pr > l t l
MA1,1	"- 1.000"	0.02217	4.51	0.0009
Constant	0.3784	0.4795	0.79	0.4467

Source: Estimated from Data of (Table 5)

Table 17 Forecasts for the Export Comparative Advantage Index of Egypt in Fruits and Vegetables

Year	Actual RXA	Forecasted RXA	Slandered Error	95% Confidence limits		RESIDUAL
				Minimum	Maximum	
1995	3.34					
1996	2.72	3.72	0.998	1.766	5.679	-1.0034
1997	2.60	2.09	0.998	0.138	4.051	0.5058
1998	2.41	3.48	0.998	1.528	5.441	-1.0743
1999	1.46	1.71	0.998	-0.242	3.671	-0.2512
2000	1.86	1.59	0.998	-0.366	3.547	0.2678
2001	1.89	2.50	0.998	0.548	4.461	-0.6153
2002	1.47	1.65	0.998	-0.304	3.609	-0.1820
2003	1.43	1.67	0.998	-0.290	3.624	-0.2368
2004	1.78	1.57	0.998	-0.385	3.529	0.2046
2005	2.32	2.36	0.998	0.403	4.316	-0.0383
2006	2.59	2.66	0.998	0.705	4.618	-0.0760
2007	3.23	2.89	0.998	0.931	4.844	0.3397
2008	6.73	3.95	0.998	1.989	5.902	2.7892
2009		9.90	0.998	7.946	11.859	
2010		10.28	2.232	5.906	14.656	
2011		10.66	2.995	4.789	16.529	
2012		11.04	3.600	3.983	18.093	
2013		11.42	4.116	3.348	19.484	
2014		11.79	4.575	2.828	20.761	
2015		12.17	4.992	2.390	21.957	
2016		12.55	5.376	2.014	23.089	
2017		12.93	5.735	1.690	24.170	
2018		13.31	6.073	1.406	25.211	

Source: Estimated Using (Table 9)

Table 18 Estimated Parameters of Relative Export Advantage Index of Egypt in Cereals

Variable	Estimated Coefficient	Standard Error	T -value	Pr > l t l
RA1,1	0.2702	0.2932	0.92	0.3783
AR1,2	-0.1343	0.3064	0.44	0.6705
AR1,3	-0.8051	0.3618	-2.23	0.0503
MU	1.7312	0.1151	15.04	<0.0001

Source: Estimated from Data of (Table 4)

Table 19 Forecasts for the Export Comparative Advantage Index of Egypt in Cereals

Year	Actual RXA	Forecasted RXA	Slandered Error	95% Confidence limits		RESIDUAL
				Minimum	Maximum	
1995	0.86	1.73	0.631	0.495	2.967	-0.873
1996	1.85	1.50	0.631	0.259	2.731	0.350
1997	1.38	1.88	0.631	0.643	3.115	-0.503
1998	2.19	2.32	0.631	1.087	3.559	-0.134
1999	1.32	1.81	0.631	0.575	3.047	-0.495
2000	1.98	1.84	0.631	0.607	3.080	0.132
2001	2.01	1.48	0.631	0.248	2.720	0.525
2002	1.12	2.11	0.631	0.872	3.344	-0.989
2003	1.44	1.33	0.631	0.096	2.568	0.112
2004	1.53	1.51	0.631	0.276	2.748	0.020
2005	2.90	2.21	0.631	0.973	3.445	0.686
2006	3.05	2.30	0.631	1.067	3.540	0.748
2007	2.50	2.09	0.631	0.856	3.328	0.407
2008	0.51	0.82	0.631	-0.412	2.061	-0.312
2009		0.24	0.631	-1.001	1.471	
2010		0.87	0.653	-0.408	2.153	
2011		2.68	0.654	1.399	3.964	
2012		3.31	0.849	1.643	4.972	
2013		2.72	0.894	0.969	4.472	
2014		1.02	0.894	-0.731	2.774	
2015		0.14	1.015	-1.852	2.127	
2016		0.60	1.074	-1.506	2.704	
2017		2.21	1.074	0.106	4.315	
2018		3.30	1.158	1.027	5.565	

Source: Estimated Using (Equation 15)

Table 20 Estimated Parameters of Relative Export Advantage Index of Egypt in Sugar and Honey

Variable	Estimated Coefficient	Standard Error	T -value	Pr > l t l
AR1,1	-0.899	0.362	-2.48	0.0348
MA1,1	-1.1555	0.2332	-4.95	0.0008
MA1,2	-1	0.4631	-2.16	0.0591
MU	0.0643	0.1278	0.5	0.6268

Source: Estimated from Data of (Table 6)

Table 21 Forecasts for the Export Comparative Advantage Index of Egypt in Sugars and Honey

Year	Actual RXA	Forecasted RXA	Slandered Error	95% Confidence limits		RESIDUAL
				Minimum	Maximum	
1995	0.54					
1996	0.59	0.60	0.334	-0.054	1.255	-0.007
1997	0.37	0.66	0.334	0.001	1.310	-0.283
1998	0.33	0.36	0.334	-0.296	1.012	-0.024
1999	0.38	0.18	0.334	-0.475	0.834	0.203
2000	1.09	0.67	0.334	0.017	1.326	0.420
2001	1.32	1.26	0.334	0.609	1.918	0.058
2002	1.47	1.72	0.334	1.068	2.377	-0.257
2003	1.61	1.22	0.334	0.563	1.872	0.392
2004	1.49	1.80	0.334	1.143	2.452	-0.304
2005	2.15	1.76	0.334	1.108	2.416	0.384
2006	1.93	1.82	0.334	1.168	2.477	0.106
2007	2.46	2.75	0.334	2.098	3.407	-0.289
2008	1.49	1.88	0.334	1.221	2.530	-0.384
2009		1.75	0.334	1.100	2.409	
2010		1.26	0.536	0.206	2.308	
2011		1.83	0.863	0.135	3.518	
2012		1.44	0.971	-0.467	3.341	
2013		1.91	1.170	-0.385	4.203	
2014		1.61	1.260	-0.863	4.076	
2015		2.00	1.411	-0.764	4.766	
2016		1.77	1.491	-1.154	4.691	
2017		2.10	1.615	-1.065	5.264	
2018		1.92	1.689	-1.387	5.235	

Source: Estimated Using (Equation 1 Up to Equation 7)

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