



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

The impact of the government policies and incentives to promote the export of agricultural products in Tunisia: case of olive oil

Walid Larbi and Athanasios Chymes

Department of Business Economics and Management Mediterranean Agronomic Institute of Chania P.O. Box 85, 73100
Chania, Crete, Greece, wlarbi@yahoo.fr

Research Fellow, PhD Centre for Planning and Economic Research 11, Amerikis Str. 10672, Athens, Greece,
athxymes@yahoo.com



Paper prepared for presentation at the 113th EAAE Seminar “A resilient European food industry and food chain in a challenging world”, Chania, Crete, Greece, date as in: September 3 - 6, 2009

Copyright 2009 by [Walid Larbi and Athanasios Chymes]. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

The impact of the government policies and incentives to promote the export of agricultural products in Tunisia: case of olive oil

Walid Larbi¹ and Athanasios Chymes²

Abstract

The agricultural sector is very important for the Tunisian economy as it absorbs 10% of the total investment, generates 12% of the Gross Domestic Product (2002-2006) and employs 16% of the total labor force while the agro food exports represent 10% of the total export.

The aim of this article is to review: a) the agreements related to the export of the olive oil between Tunisia and the European Union (EU) and b) the agricultural policies and incentives enforced by the government to increase the export of olive oil.

For the above mentioned aims, we obtained and analyzed data from the Ministry of Agriculture in order to analyze them and find the policies and incentives that help to increase the export of olive oil.

Keywords:

Tunisian agricultural policies, Export, International conventions and agreements, Olive oil , Export function

¹ Department of Business Economics and Management, Mediterranean Agronomic Institute of Chania, P.O. Box 85,73 100 Chania, Crete, Greece

² Research Fellow, PhD Centre for Planning and Economic Research 11, Amerikis Str. 10672, Athens, Greece

1. Introduction:

The development of the agriculture sector remains economically as well as socially very important for Tunisia, because of its considerable contribution to the achievement of national objectives regarding food security, employment, regional and rural areas development, food balance equilibrium and social cohesion. The agricultural sector benefits by 10% of the total investment. It generates 12% of the Gross Domestic Product, it employs 16% of the total labour force and the agro-food exports represent 10% of the total export (The Tunisian Central Bank, 2008).

The agricultural development policy during the period 2007-2011 is based mainly on the following four axes:

- the mobilization and the preservation (conservation) of natural resources on a long-term basis.
- the improvement of the competitiveness of the sector.
- the promotion of exports.
- the consolidation of the food security of the country which represents the vector of national sovereignty. (The African Bank of Development, 2007).

During the last two decades, Tunisia started a very important program of deep structural and economic reforms, aiming to a gradual rehabilitation of an open trading process to its economy as a whole. These reforms generated a new environment of economic development, and all sectors of the economy including agriculture started to recover and to accomplish comforting production results as well as to increase export earnings. The economic policies and the structural and institutional reforms undertaken by the agricultural sector have helped the sector to undergo a modernization process in most agricultural activities, characterized by a progressing intensification and the use of technology in the agricultural growing activities.

The main Tunisian agricultural productions are: cereals, livestock, arboriculture, vegetables and fisheries.

In this paper we present the importance of the agriculture sector in the Tunisian Government and the most important governmental policies and measures undertaken during the two past decades in order to develop the production of farm produces especially those which affect the exports such as olive oil and the most important agreements and funds signed by Tunisia to promote the export of olive oil.

At the same time and in order to propose policies to boost olive oil, we analyse the export function of Tunisian olive oil towards the EU given the fact that 80% of the total export of olive oil is sold in the European markets using five explanatory variables presented in the study case.

2. Description of Tunisian agriculture sector:

Tunisia is divided into seven bioclimatic regions favorable to a big variety of agricultural practices, with a rainfall ranging from 50 millimeters in the south of the country to an average greater than 800 millimeters in the North. Besides, the existence of microclimates in certain areas of the country provides the Tunisian agriculture with a specificity which, combined with the general Mediterranean weather, contributes to the diversification of its production from one region to another.

The area of land used for agricultural purposes is estimated at 10 million hectares in which 5 million hectares represent the arable land. In fact, the area equipped for irrigation covers 420 thousand hectares, which represents 4% and 8% respectively of farmlands and arable land. The production is dependent on climatic conditions; 92% of farmland is under the dry farming system. The water mobilization efficiency has reached 93 %, with a future objective of 95 % of mobilization of the total water resources being targeted for the year 2011. (Ministry of Agriculture,2008)

The structure of production is dominated by cereals followed by livestock, arboriculture (olives, dates, citrus, grapes, almonds etc), vegetables.

A recent statistical investigation (2000-2005) showed that 75 % of the 576 thousand farms are less than 10ha in area; the majority of the farmers more than 60 years old was 43 % in 2005 while it was 37 % in 1995. Concerning the financing of the agricultural activity it is based essentially on self-financing (56%), while bank credits represent only 20 %. (Srarfi, 2001)

Only a few food-processing sectors are integrated into the agricultural production.

We ought to mention that the contribution of producer organizations at the level of the marketing of farm produce is very weak.

The farming sector succeeded in realizing performances thanks to diverse projects, programs and policies of development and also by at first the continuation of the run-up of the economic and institutional reforms, secondly by the positive reaction of the farmers towards the measures taken in favor of the sector and finally by the realization of the targeted annual average growth rate of the added value (2.6 %) (Francesco Abbate, 2001)

The agriculture production has increased during this last decade.

Table 1: The evolution of the Tunisian agriculture production between 2000 and 2008

Product	Production year 2000 (1000 tons)	Production year 2008 (1000 tons)
Cereals	2000	4000
Olives for oil	750	1000
Citrus fruits	225	247
Dates	105	131
Potatoes	290	738
Tomatoes	950	1005

Source: General Management of Agricultural Studies and Investment, 2000-2008

The improvement of the productivity is due to a better use of land and water efficiency.

The trade food balance tends to be balanced thanks to a greater dynamics of the exports of farm products.

Table 2: The trade food balance (2004-2008)

Years	2004	2005	2006	2007	2008
Exports(million TND)	1227,4	1225,6	1599	1615,5	1844
Imports(million TND)	1037,3	1093,3	1321,9	2042,3	2572
Cover rate	118%	112%	121%	79%	72%

Source: General Management of Agricultural Studies and Investment , 2009

The development policies in the agricultural sector have to set up a sustainable agriculture, to diversify production and to preserve the natural environment. To achieve these objectives, the Ministry of Agriculture has to intervene at several levels in order to:

- guarantee a sustainable food security of the country based on an auto-production of the most strategic agricultural produces. However, the principle of the economic efficiency must be taken into consideration;
- protect the natural resources against all forms of degradation (erosion, desertification, and overexploitation);
- perpetuate the agricultural activity in a context of instability of the overseas markets;
- establish a market pricing monitoring program based on the international strategic crop production and prepare the market to efficiently respond to forecasted fluctuations,
- reinforce tackling the climatic changes causing catastrophes by enhancing the actions and development of the agricultural insuring companies and installing scientific and technical orientation tools for the farmers,
- prepare the Tunisian agriculture to better face the liberation of trade, and secure a more solid international position of the national product by preparing

campaigns to advertise specific produce such as Tunisian fruit and vegetable varieties.(Ministry of Agriculture,2008)

3. The importance of olive tree cultivation in Tunisia:

The Tunisian history of olive oil dates back to the 8th century BC, even before the founding of Carthage. The Romans continued the expansion of olive cultivation especially with the strengthening of irrigation and the development of techniques for extracting olive oil from the fruit.

Tunisia currently has 65.9 million olive trees covering 1.685.000 hectares, which represents a third of the nationally available agricultural land. Olive trees are cultivated in widely varied climatic conditions, thus from north to south they are situated as follow: 15 % in the North, 66 % in Central Tunisia and 19 % in the South. Olive trees are mostly planted in monoculture and sometimes in intercalary with other fruit trees. They occupy all too often poor and marginal lands, threatened by erosion and desertification. (Ministry of Agriculture, 2008)

The Tunisian agriculture is very rich in olive cultivars (56 different varieties). However, despite this richness, only two varieties are omnipresent in arable land (land that can be used for growing crops): Chemlali, located chiefly in the south, and Chétoui, which dominates the north. The Chemlali olives hold a flavor that is buttery with bold complexities. The Chétoui olives result in a sweet, light to medium intensity oil with an outstanding fruit flavor and an incredibly delicious finish. (Ministry of Agriculture, 2007)

The anchoring of the cultivation of olive trees in the Tunisian traditions, provides privileges for the production and the consumption of olive oil, and makes olive trees cultivation a major contributor in raising the income of more than 309 000 small and middle farmers; it also constitutes a main activity for 30 % of the total farmers. The olive production sector ensures working alternatives and occupations for over a million of citizens.

The structure of olive trees cultivation reveals a dominance of the small and

medium sized farms. The farms having a size lower than 10 and 5 ha represent respectively 57 % and 35 % of the total number. The latter has a hardening effect on the introduction of cutting-edge technologies and the massive machinery investment. This remarkably leads the sector to further manifest the shortfalls symptoms of a weak production. (Ministry of Agriculture, 2008)

The Tunisian olive oil production shows a clear annual fluctuation due to a biological alternation in the production of the olive tree, and also to the changes of weather conditions and the non-availability of weather forecast information to the farmers.

The production of olives during the 2007-2008 campaign reached 900 000 tones which is the equivalent of 200 000 tones of olive oil, making an 11% increase with regard to the previous campaign (2006-2007) where the production was 180000 tons of oil. This production level is superior with a 32% increase compared to the average production during the decade 1998-2007 estimated at 151000 tons of olive oil. (Ministry of Agriculture, 2008)

Table 3: The Evolution of the production of olives and olive oil (1000 tons):

	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Production of olives	1125	550	150	350	1400	650	1050	900
Production of olives oil	225	115	30	72	280	130	210	180

Source: Annual reports of the Central Bank of Tunisia and The Ministry of Agriculture

The distribution of the production of olives is as follows; 15% in the South, 66% in the Central Tunisia and 19 % in the North. Besides, the oil content of olives produced in the South is slightly higher than in the other regions. Thus, the southern part of Tunisia contributes with 55 % to the total national production of olive oil while it is only 27 % for Central Tunisia and 18 % in the North. (Annual Report of Tunisian Central Bank, 2007)

The average yields of olive trees in Tunisia are generally judged below potentialities; they could be three-fold for the North and the Central Tunisia and

double for the South. For the period 2007-2008, the average yields of olive oil by productive tree were 22 kg in the North, 47 kg in Central Tunisia and 47 kg in the South. The average yields for all the country is estimated at 616 kg of olives by productive hectare; that is 757 kg / ha, 331 kg / ha and 518 kg / ha respectively in the North, Central Tunisia and the South. The average density of olive trees per hectares is as follow: 92% in the North, 35% in the Center and 22% in the South. (Tunisian Statistical Survey, 2007-2008). The advantage of the olive trees of the North is explained by higher densities of olive trees by hectare. (Ministry of Agriculture, 2007)

Olive oil occupies an industrial processing of about 1660 units having a triturating capacity of 32000 tons/day. The olive oil industry is often underused, in particular during the years of weak production. This sub-use is aggravated by the seasonality of the production. Indeed, even during the years of good harvests, the industries work rarely more than 90 days a year.

The extraction systems of olive oil are mainly three types:

- * Triturating units that are equipped with a continuous chain
- * Traditional triturating units
- * Super press triturating units

The geographic distribution of this capacity is listed in Table 2

Table 4: Distribution of the trituration units by region and system

types of extraction systems of olive oil/ region	Traditional	Super press	Continuous chain	total	%
North Tunisia	49	54	99	202	13
Central Tunisia	304	132	287	723	46
South Tunisia	274	191	177	642	41
Total	627	377	563	1567	100
%	40	24	36	100	

Source: ONH 2008

The systems of olive oil extraction are classical (more than 65 %), which limits the quality of the olive oil.

Concerning the export of the olive oil, Tunisia has exported on average 114596 tons of olive oil per year during the period 2001-2007. The quantity exported represents 70% of the total production. It provides nearly 16% of the global exports.

Table 5: The development of exports of olive oil in thousands of tons:

Campaign	99-01	00-01	01- 02	02-03	03-04	04-05	05-06	06-07
Exports	114	95	22	39	209	98	167	155

Source: Annual Reports of the Central Bank of Tunisia

Over the years, the world market of olive oil undergoes a net fluctuation in the prices resulting in a variability of the prices in the export of the Tunisian product. A period lap from 2000 to 2007 is presented in table 6:

Table 6: The Evolution of the average export price (currency TND)

Years	2000	2001	2002	2003	2004	2005	2006	2007
The average export price	2318	2119	2478	2868	3353	4358	4944	4032

Source: General Management of Studies and Agriculture Development

Tunisian olive oil is mainly exported in bulk form (98%), while the export of packed olive oil represents less than 2%.

Table7: The structure of exportations (tons):

Campaign	Quantity Exported	Packed exportation	Bulk exportation	% packed	% bulk
2005-2006	137689	820	136869	0,60	99,4
2006-2007	182369	1721	180648	0,94	99,06

(Source: Annual Reports of the Tunisian Central Bank)

Tunisia exports several qualities of olive oil. However, the main part of the exports concerns extra virgin oil and lamp oil. Other qualities are considered

marginal and irregular. It is the lamp oil quality that represents the biggest part of the exported olive oil: more than 60 % of the total export against 30 % for the extra virgin quality. The largest tonnage is intended for Italy.

The Tunisian exports of olive oil are designated for three groups of countries: EU, Arab countries and others:

- The European Union absorbs the major part with over 80% of total export,
- From the Arab Countries: Libya is the main potential importer of Tunisian olive oil. Besides some Middle Eastern countries that import minor quantities of Tunisian olive oil,
- Small quantities are being sold to USA-Japan and Australia.

The Tunisian Olive Oil Office was before 1994 the only and largest supplier of olive oil to many countries in the world. The olive oil sector plays a strategic role in the Tunisian economy; the export of olive oil is an important source of foreign exchange, and is the subject of high concern reflected in various policies and strategies adopted for its development, like the national strategy to promote the sector, adopted since 1988, in addition to restructuring the sector, initiated in 1994, and opening the sector to exporters.

The economic importance of the sector is reflected through its contribution of up to 44% in the Tunisian agricultural exports. The annual average export of olive oil has achieved over the past decade close to 120 thousand tons.

Olive oil exports from Tunisia to the European Union are larger than from any other non-EU country, with the largest demand coming from Italy, Spain and France.

The Tunisian average consumption of olive oil over the past 20 years has been

fluctuating. The national Consumption is about 6.7 kg of olive oil/person/year, against 15.16 kg for vegetable oils per person per year.(ONH, 2008)

Table 8: The evolution of consumption of oils per capita: (kg)

	1980	1985	1990	1995	2000	2005
Olive oils	4,5	6	8,2	6,1	8,2	7,2
Vegetable oils	11,2	14,8	16,9	16,7	15,9	15,5

Source: INS (2005)

The cost of imported vegetable oil is less expensive than olive oil; it has suffered the effects of competition in the consumer choices for cheaper oil. Mixtures of vegetable oils and olive oil have been practiced for several years, especially in times of difficulties for the flow into foreign markets.

Table 9: Recent developments in the price of olive oil

Campaign	Average production prices in TND /ton	Average consumer prices in DT /kg
2006	890	6,15
2007	570	4

Source: International Olive Oil Council (2000-2007)

Table 9 shows the evolution of fixed prices to the production compared with the consumer prices.

The consumer price of olive oil is on average five times higher than vegetable oil; the latter continues to benefit from the intervention of the General Compensation Fund (GCF). Those related prices obviously play a role in Tunisian consumer behavior, who eventually selects vegetable oil rather than olive oil because it is much cheaper.

4. Different agreements and funds to develop export of olive oil:

Tunisia has made enormous efforts both nationally and internationally for a better regional integration: the South-South cooperation and the North-South cooperation which are called in most for a market and trade liberalization such as:

-The formal accession of Tunisia to the General Agreement on Tariffs Trade (GATT) in June 1990 and to the World Trade Organization (WTO) in 1995.

- The signature of the final act of the Uruguay Round on the 15th of April 1995

- The conclusion of the following four multilateral free trade agreements:

*The agreement related to the partnership with the European Union (Report of the European Union, 1995);

*The convention related to the Great Arab Free Trade: full exemption from all customs fees exporting agricultural products to Arab countries since 1998;

*The Agadir Agreement signed in 2004;

*Agreement related to the free exchange area with some European countries (Switzerland, Norway and Iceland) since 2004;

-Furthermore six bilateral agreements were established respectively with Egypt and Jordan in 1998, with Morocco in 1999, with Libya in June 2001, with Syria in 2002 and with Turkey in 2004. (Ministry of Agriculture: Direction of International Cooperation, 2005).

Tunisian commercial policies have been oriented since 80's and 90's to promote the export of agriculture products and other products on the one hand and to improve the place of Tunisia within the European Union market, as a traditional customer and the first trading partner of Tunisia and to get a better place in the Arab countries markets on the other hand.

The free trade agreement signed with the European Union opened wide prospects for Tunisia by setting regulations for exchanging agricultural products and by giving some advantages such as:

- The privileges of full exemption from customs fees without specifying the quantities exported and the periods of export (products of animal origin, some fresh vegetables, including sweet and hot peppers, legumes, some fruits and fresh fruits like dates citrus, lemon and fresh pomegranate, and the cactus fruit , several prepared and preserved vegetables and fruits, some spices , seeds and nursery plants).
- The privileges of full exemption from customs fees with provisions for a certain period of time in which exports of products benefit from mentioned privilege and for some exporting products of which may constitute some difficulties in the EU market beyond this period of time (the majority of various fresh vegetables and some fruits and fresh fruits)
- The privileges of full exemption from customs fees within certain tariffs and quotas (olive oil, citrus fruit, wine, potatoes, flowers, tomato paste, apricot, almond, natural honey, olives, truffles). The annual quota for olive oil has been 56000 tons from 2005.
- The privileges, in the form of a reduction in various proportions, of the customs fees without specification of the quantities exported (some prepared vegetables and fruits).

For the past decades Tunisia has undertaken important institutional and structural reforms which have led to deep transformations of the economy as a whole. These transformations were accelerated by the implementation of the agricultural structural adjustment program from 1987 to 1994 which aimed in particular to strengthen the sector's contribution in the economic growth, to strengthen the sector's contribution to reach the equilibrium of the balance of payments and the public finances, to strengthen the sector's contribution in the

creation of employment and to reach a higher insertion of the private sector in agriculture by liberalization of competitive activities.

In order to achieve these objectives, the government has undertaken a series of economic and institutional reforms to improve the environment of the sector, to promote and strengthen the role of the private operators and to restore the market's role in the regulation of prices for most agricultural products.

In this economic context, the promotion of investments has been a major interest for the achievement of the state policy objectives. Hence, we distinguish the period marked by the creation of the Agency for the Promotion of Agricultural Investments in August 1982 characterized by the strengthening of incentives started from 1983 and by the creation of the Special Fund for Agricultural Development; this fund provides financial benefits by activity and farmer category.

These measures have been strengthened by the commitment successively in 1988 and 1993 of the promulgation in April 1988 of the investment code in agriculture and fisheries which provides new fiscal and financial benefits, and the establishment of a law in December 1993 concerning the reforms of the previous measures and incentives for investments by promulgating the incentive code, the creation of the Institute of Olives in 1983, and its reorganization in 2000, which have allowed the institute to undertake research actions, studies and experimentation likely to develop and promote the olive sector in order to reach an annual production target of 100000 tons at least, by improving the genetic resources of olive trees, the cultural techniques of growing olive trees, the promulgation in June 1999 of a law related to the implementation of the Controlled Appellation of Origin and the indication about the growing origin of agricultural produce (Indication de Provenance: IP) which aims at the protection of the particularity and the specificity of agricultural produce and to enhance their value, as well as the elaboration of a series of studies and strategies to

develop and promote olive oil production as well as its processing and its marketing both in Tunisia and outside of the Tunisian export.

On the other hand the agricultural sector has benefited from a variety of direct as well as indirect financial and fiscal incentives, to stimulate agricultural activities and to improve their competitiveness. These measures relate, among others, to the support of various funds. The most important funds related to the development of the cultivation of olive oil are as follows: first, the creation in June 1988 of a fund for the promotion of the olive growing sector (FSDO), then in December 1994 the fund concerning the development of competitiveness in agriculture, fishery and agro-food industries (FODECAP) and finally the establishment of the Great Presidential Prizes in March 1998 to promote agricultural activities including the olive oil growing sector.

The other measures and incentives undertaken by the government of Tunisia to promote the export of agricultural and agro food products including olive oil are as follows: the creation of the fund for the promotion of exports – FOPRODEX, the FAMEX and the creation in July 2006 of the special treasury fund to promote the production and the marketing of packed olive oil (FOPROHOC).

5. The most important impact of policies and measures to develop olive tree production and export:

The agricultural policies and measures related to the development of the olive sector started since 1949 by the creation of the first fund to sustain the olive sector and it was amended in 1988.

The Agricultural Structural Adjustment Program (1987-1994) led the government to undertake simultaneously a number of structural and institutional reforms that allowed for the improvement of the general environment of agriculture, to foster the role of the private operators and to progressively implement the trade liberalization. It also helped to elaborate the first strategy to develop the olive sector (1958) and the creation of the Institute of Olive (1983).

At the international cooperation level, during the nineties, Tunisia signed the association agreement with the European Union, the accession of Tunisia to the G.A.T.T.; and to World Trade Organisation (W.T.O) and the signature of the final act of the Uruguay Round, which allowed the agricultural products to access international markets and to increase the export of agricultural products including olive oil.

From 1988 until now, the olive growing sector was marked by the elaborations of different laws, strategies and studies related to the improvement of growing olive trees, upgrading agro-food industries, notably olive oil processing, the adoption of guaranteed minimum production prices of olives to insure farmers revenues, the promotion of olive oil marketing and exports and the promulgation of quality laws.

The impacts of the previously presented policies and incentives measures related to the development of the olive growing sector translated into the increased state support and interest in this important sector.

Overall, these policies and measures had important results on the evolution of the national production of olives and olive oil, and its marketing in the local as well as in the external markets notably of the European Union.

The cultivated areas of olive trees progressed continually during the last fifty years. They reached an increase of 400000 ha during the last twenty years.

Table 10: The evolution of the new cultivated areas with olive trees (1987-2001)

Year	Quantity Unit ha
1987-1991	81.179
1992-1996	73.118
1997-2001	118.000
2002-2006	140.000

2007-2011	100.000
-----------	---------

Source: General Management of Agricultural Production (2006)

The number of farmers cultivating olive trees had increased from 270.000 during the 1994-1995 survey to 309.000 during the 2004-2005 survey. They represent 60% of total farmers.

Table 11: The average production of olive oil (1961-2005)

Year	1961-1970	1971-1980	1981-1990	1991-2000	2001-2005
Quantity /Unit tons	58.000	106.000	98.000	169.000	172.000

Source: The National Office of Olive Oil, 2005

The average national production of olives reached 754.000 tons during the two last decades. It increased during 1996-2005 to reach 840.000 tons but did not exceed 665.000 tons during 1986-1995; the increase rate was about 26.2 %.

Because olive production fluctuates from year to year, the least production was 150.000 tons of olives during the 2001-2002 season due to drought, and the highest level of production was 1.470,000 tons during the 2003-2004 season.

The average yield of olive production by hectare increased from 412kg/ha during the 1986-1995 period to 498kg/ha from 1996-2005. The increase was about 20.7% at the national level.

The olive sector employs annually 20% of the total labour in agriculture, and 35 million working days. (Ministry of Agriculture, 2006)

As far as the marketing of olive oil is concerned, the National Office of Olive Oil has been, since its creation in 1962, the main operator for collecting, storing, supplying, and marketing olive oil in the local market and in the export markets. However since 1994, date of the liberalization of the collecting and the marketing, these activities have been assured by the National Office of Olive Oil as well as by some private operators.

The liberalization of these activities affected the share of the National Office of Olive Oil in the exporting market. In fact during the last season (2007-2008) the total quantity of exported olive oil reached 168000 tons, the private operators exported 160000 tons, while the National Office of Olive Oil exported only 8000 tons, which represent 7.2% of total quantity of exported olive oil. (Ministry of Agriculture of Economic budget, 2008).

The number of the private operators reached 134 that were agreed to market olive oil among them 65 were exporters of olive oil.

Table 12: The evolution of the number of private exporters of olive oil

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
4	6	25	30	12	57	48	51	50	53	41	42	63	60	65

Source: Ministry of Agriculture, 2005

Tunisia has traditionally been the main olive oil exporter to the European Union. Most of the produce is exported in bulk form, and shipped to Italy which remains the main importer of Tunisian olive oil with around 60% of the total quantity exported, followed by Spain with 20% of the total quantity exported, followed by the USA which came out as the third destination for exported olive oil with 11.4% of the total quantity exported.

The olive oil shipped in bulk towards these countries was either processed or blended with oils from other regions and then sold with Italian or Spanish or American labels. The rest of the exported olive oil was shipped to Arab countries; with some (2%) sent to non European countries in conditioned form. (Report of Tunisian Central Bank, 2007)

80% of the Tunisian total production of olive oil is exported; the remainder is sold in the local market.

Tunisia exports almost exclusively virgin olive oil. The quantity exported of virgin olive oil reached the rate of 60% of the total exported olive oil during the

2002-2006 periods, which represents 30% before that. More than 90% of Tunisian exports are shipped to the European Union.

The strategy elaborated recently in 2005 by the Ministry of Agriculture, aimed essentially towards the production of qualitative olive oil through the increase of Tunisian olive oil performances in order to face the difficult competition brought about by the emergence of new olive oil producing and exporting countries to the European Union, such as Turkey, Syria- Morocco and some European countries (Portugal) and to develop adequate production and commercial capacities so as to maintain its share in the European market and to export more olive oil in the world market, according to international standards, through the application of the necessary quality measures, and to increase the agricultural value added of high quality exported olive oil in both bulk form as well as conditioned through the increase of export prices.

The average export price of olive oil was 3.6 dinars/kg (1.9 Euro/kg) during the 10th planning period (2002-2006) against 2.17 dinars/kg (1.14 Euro/kg) during the 1991-2001 decade (Document of Agro-Industries related to the olive oil situation September 2005).

Table 13: The evolution of the average price of exported olive oil in Dinars/Kg

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1.43	1.44	1.58	2.4	4.0	2.29	1.82	2.3	2.3	2.12	2.5	2.86	3.35	4.35	4.96

Source: Ministry of Agriculture, 2005

6. The case study of the export function of olive oil:

The export function used for the case study of the export of olive oil to the European Union depends essentially on the following five explanatory variables which are: the national price of olive oil (Px), the international price of olive oil (PM), the national production of olive oil (Zx), the EU production of olive oil

(ZM) and finally the EU consumption of olive oil (YM).(Ministry of Agriculture,2008)

The formulation of the export function model considered in our case study is the following:

$$\text{Log } X = \beta_0 + \beta_1 \text{Log } P_x + \beta_2 \text{Log } P_M + \beta_3 \text{Log } Z_X + \beta_4 \text{Log } Z_M + \beta_5 \text{Log } Y_M + \mu$$

Where μ is the term of error

The present work analyzes the exports of Tunisian olive oil towards the EU given the fact that 80% of the exports of the Tunisian olive oil are sold to EU markets.

The temporal horizon considered for our analysis is thirty annual observations going from 1978 to 2008.

In this work an analysis of cointegration is used as a basic abstract frame to test the existence of a still relation between two or several non still series (Engel and Granger, 1987). The stages of this method are described as follows:

First, we determine the order of integration of variables (Unitarian number of root) (Dickey, D.A. and W.A. Fuller,1981).For that purpose, we use the tests of Dickey-Fuller (DF) and Dickey-Fuller Augmented (DFA), whose critical values are given in Mackinnon (1991).

Secondly, we test the relation between the variables which could be co integrated. For that purpose, we apply a test of stationarity.The concept of stationarity is important in modelling time series. The stationarity plays an important role in the prediction of time series, the interval of prediction is different depending on whether the series is stationary or not. (Hargreaves CP., 1997) .To study the stationarity test, we use the Augmented Dickey Fuller (ADF). The principle of this test is as follow: we will first test the variables in level, then first and second difference on the non-stationary variables in level. It

will stop when they are all stationary (in our case series are stationary in first difference).

In the third part, we estimate the function of export using the short and long term Model of Correction of Error (MCE), that is, in which the difference in variables express themselves, and we include, also, a term of adjustment of the distance from the dependent variable by reporting its value of long-term balance. (Mackinnon, J.G, 1991)

7. Results

The econometric model was used essentially to analyze the export function of Tunisian olive oil to the European markets and to study the major determinants of the export of this product during the last 30 years (1978-2008).

The empirical results of this analysis reveal that the exported Tunisian olive oil to Europe (mainly to Italy and Spain) is affected significantly by two variables:

- ✓ The level of the national production of olive oil
- ✓ The export prices

- The coefficient of world prices is negative and significant at the 5%, which allows us to conclude that any increase in the taking of olive oil on the world market leads to a reduced demand for the product on the world market (and Following on the European market) which causes a decline in exports.

- The ratio of domestic production is positive and significant at the 1% level, an increase in domestic production creates positive effects on exports. Any increase in Z_x leads to increase of X , a 10% increase in Z_x leads to increase of 3.9% of exports. Tunisia is invited to increase its production in order to meet any request for this produce on the global market and can subsequently win largest shares in the market.

Dependent Variable: LOG(X)

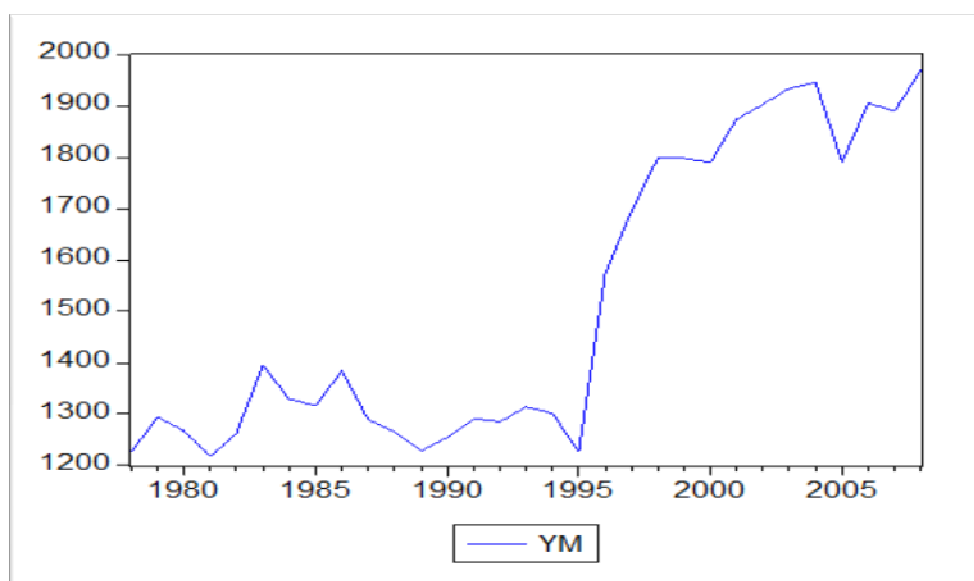
Method: Least Squares

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.742776	3.770318	-0.992695	0.3300
LOG(PM)	0.228510	0.345866	0.660691	0.5146
LOG(PX)	0.019046	0.301127	0.063248	0.9501
LOG(YM)	0.601485	0.706483	0.851380	0.4023
LOG(ZX)	0.391666	0.169397	2.312121	0.0290

R-squared	0.415801	Mean dependent var	4.418152
Adjusted R-squared	0.325925	S.D. dependent var	0.575866
S.E. of regression	0.472798	Akaike info criterion	1.486394
Sum squared resid	5.811991	Schwarz criterion	1.717682
Log likelihood	-18.03910	F-statistic	4.626353
Durbin-Watson stat	1.162310	Prob(F-statistic)	0.005913

Also the model shows that the other explanatory variables (PX,PM,YM) were insignificant for the export function but logically these variables do affect the export function especially the EU consumption of olive oil YM that had shown a net increase since 1995 as is explained in the following graph:



The model used in the present study has taken in consideration some of the explanatory variables of the export function of Tunisian olive oil. But we are aware that there are other variables that could have been considered such as the

investments at the production stage and also at the processing stage, unfortunately because of the unavailability of data needed for the considered period of time (from 1978 to 2008) we couldn't include them in the model and we may suggest that they can be the object of further research studies.

8. Conclusion:

Given the previous results, we can say that the adoption of policies and incentives by the government should be oriented to the increase of national production of qualitative olive oil by encouraging olive oil farmers to improve the productivity of olive trees and the quality of olives to reduce the cost of production in order to improve the competitiveness of the Tunisian olive oil in the world markets and also by establishing a quality bonus and by implementing protection schemes for geographical indications and appellation of origin and traceability these are considered as strategic instruments of the development of olive oil trade in the EU as well as in the world markets. Thus, Tunisian olive oil could gain a higher export price.

As we already mentioned, Tunisian olive oil exported to Europe is 40% virgin oil and 60% lamp oil. The objective of the quality program should inverse these rates so we will export 60% or more of extra virgin oil and only 40% of lamp oil and most of the Tunisian olive oil is exported in bulk less than 2% is conditioned.

To undertake such a quality improvement strategy, the Tunisian olive oil sector will definitely need better organization given that olive oil production is small scale and fragmented.

Quality needs to be raised and the production processes of olive products methods, the irrigation, the pruning, the fertilization and harvesting methods must be modernized and progressively mechanized.

The quality of olive oil needs to be improved at the processing and industrial level, the extraction of the olive oil process has to be modernized and the olive oil industries have to adhere and join the quality up grading program.

The cooperation between Tunisia and the International Center of Olive Oil (IOC) needs to be strengthened and the annual programs should cover all the stages of producing qualitative Tunisian olive oil as well as the training of qualified human resources.

In order to get better exporting prices, quality is a key factor and the marketing conditions also affect the price of Tunisian olive oil. The strategy launched by the Ministry of Agriculture in 2005 for a three year plan which is aimed to move gradually from exporting in bulk at low prices and instead increase the percentage of olive oil that is conditioned in Tunisia with a Tunisian brand and label and then sold to wholesalers from the current 1% to a figure of 10% in 2011.

Favorable market conditions create opportunity in order for Tunisians to take advantage of such market opportunities the olive oil export operators should further develop their quality management and international marketing skills so as to meet the strict requirements of traders and retailers of the international supply chain.

As Tunisian olive oil gains wider acceptance by the consumers in the EU and in the world export improves and the exported quantity increases. The different and various funds created recently such as FOPRODEX, FOPROHOC and FAMEX will all help to improve the capacity of export operators to look for new markets for Tunisian olive oil.

9. Recommendations:

All the recent studies concerning the improvement of the Tunisian olive oil sector from the cultivation to the marketing of Tunisian olive oil and the strategies undertaken by the government of Tunisia during the last two decades within the Ministry of Agriculture ,the Ministry of Industry and the Ministry of Trade have proposed a large number of recommendations that can be classified according to the usual channels from the cultivation of olive trees to the processing of olive oil to the marketing of this produce.

❖ Cultivation and production of olives:

- to encourage the extension of the planting of olive trees in dry or irrigated area and also the mixed plantations of olive tries with arboriculture,
- to introduce initiative prices and premium for quality production,
- to develop the extension of modernized technologies intended for farmers in cultivation, irrigation, fertilization and harvest,
- to develop adapted research programs to improve the productivity of olive trees the competitiveness of olive oil and its quality,
- to implement the legislation related to the geographical indication and controlled appellation of origin and the traceability of olive oil production,
- to facilitate the financing of activities related to the cultivation of olive trees, the harvest, plant protection, irrigation, transport and storage of olives (fund for competitiveness, credit facilities, fund for the promotion of the olive growing sector FSDO);

❖ The processing and extraction of olive oil:

- to modernize the pressing units and help oil mill owners to join the quality up grading program;

- to facilitate the financing, by the FOPROHOC fund, of the extension of processing units and of storing capacities in the area of olive production;
- to facilitate the financing, by the FOPROHOC fund, of the creation of the conditioning units of olive oil, so as to help increase the share of conditioned exported olive oil from 1% in 2007 to 10% in 2011; and
- to establish a quality label for Tunisian olive oil in order to help with access to the EU as well as the world market;

❖ The promotion of export of olive oil :

- to develop management and international marketing skills of olive oil export operators ,
- to increase the advertising and promotion of Tunisian olive oil in Europe and Arab regions , US, Canada , Japan and Australia with the help of the International Olive Oil Council;
- to organize show rooms in Tunisia and to participate in international fairs and agro-food shows to promote Tunisian olive oil ;
- to organize competition for the best conditioned olive oil; and
- to help the export operators to look for new markets for exporting olive oil;

REFERENCE LIST

Annual Economic and political review Tunisia, vol5, page 153-157.

Annual Report of Tunisian Central Bank 2007 page 50-60.

Boubaker KARRAY. 2007, Olive Oil world Market Dynamics and Policy Reforms: Implications for Tunisia.

Bernard M. Hoekman, Hanā' Khayr al-Dīn. 2000, Trade Policy Developments in the Middle East and North Africa.

Center of national studies, National Office of Olive Oil Cooperation.

Document of the World Bank; Tunisia's Global Integration: Second Generation of Reforms to Boost Growth and Employment, 2008.

Dickey , D.A. and Fuller , W.A (1981) . Distribution of the Estimators for Autoregressive Times Series with a Unit Root. Journal of the American Statistical Association, n°74, pp.427-431.

Engle , RE and GRANGER , CW (1987) Co integration and Error Correction : representation , estimation and testing .Econometrica, n°55,pp251-276.

FAO report: <http://www.fao.org/docrep/V9321E/V9321E00.htm>.

Finger, J.M., Kreinin,M.E. The measure of export similarity and its possible uses. Economics journal . 89 :905-12.

Francesco Abbate,« The integration of Tunisia in the Global Economy: Opportunities and Challenges», September 2001, page 34.

Hargreaves, CP, (1997), Non stationary times series and Co integration . Oxford University Press.

Houssein Eddine Chabbi and Lassad Lachab « Paper on agricultural sector and economic growth in Tunisia » (2005).

K. Mattas, G. Baourakis « Market and Trade policies for Mediterranean agriculture : the case of fruit, vegetable and olive oil » year 2007, page 9.

Le 11ème plan de développement 2007/2011: rapport de la commission sectorielle du développement agricole, de la pêche et des ressources naturelle, Juillet 2007.

Moufida Jaballah Srarfi, «The financing of private investment in the agricultural sector in Tunisia: The role of the banking system», Department of Development and International Cooperation Tunisia, 2001, page 5.

Ministry of Agriculture : Direction of International Cooperation.

Ministry of Agriculture : Document of the 11th plan (2007-2011) July 2007.

Ministry of Agriculture : Direction of agricultural export Product.

Ministry of Agriculture ; Document of 11th plan (2007-2011), July 2007, page 30.

Ministry of Agriculture ; General Direction of Agriculture Production (2006).

Ministry of Agriculture of Economic budget October 2008, page 47.

Ministry of agriculture; Agro-industries related to the olive oil situation September 2005.

Mackinnon, J.G, (1991). Critical values for co integration test. In Engle, R.F and Granger, C.W.J. , Long run Economic Relationships ; Reading in co integration . Oxford University.

ONH report :http://www.onh.com.tn/html/exp_exp/exp_exp.htm

Pasca, R.1978 Mediterranean agricultural trade problems and the effects of the EC policies. European Review of Agricultural Economics 3-4 :221-254.

World Bank Document « Tunisian Agreements main issues »page 305-307.