Are the Mediterranean countries competitive in fresh fruit and vegetable exports?

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Abstract

The Barcelona Agreement was signed in 1995, setting forth a structure with bilateral agreements between the EU and twelve Mediterranean countries. The agreement also foresaw the creation of a free trade area in the Euro-Mediterranean region by 2010. For many of the countries surrounding the Mediterranean sea, fruit and vegetables are very important products. In light of the increasing trade liberalization and thus increasing competition between countries, this paper aims to investigate further the competitiveness of Mediterranean countries with respect to fresh fruit and vegetables. The results generally show that the competitiveness of the investigated countries has deteriorated over the period. In only two cases, there is an increase in competitiveness.

1. Introduction

Trade performance is a highly topical area today due to the trade facilitation resulting from the ongoing liberalization process in the world. For the countries surrounding the Mediterranean Sea, trade has often been an important wealth-creating vehicle over the centuries. The Barcelona Agreement was signed in 1995 between the European Union (EU) and 12 Mediterranean countries (MEDs). One objective of the Barcelona Declaration is to establish a free trade area in the Euro-Mediterranean region by 2010. The agreement sets forth a structure where bilateral agreements, called Euro-Mediterranean agreements (EMAs), are to be signed between the EU and the MEDs (Kuiper and dell'Aquila 2004), eventually encompassing all economic sectors (Gallina 2005).[1] The liberalization process is especially important for the agricultural sector for two reasons. Firstly, large parts of the Mediterranean economies are dependent on agriculture and free trade with a major trading partner such as the EU could thus be a substantial stimulus to the region. Although trade in horticultural products has increased substantially over the last decades, trade could increase further if the protective measures of major trading partners were reduced (Huang 2004). Secondly, it is reasonable to assume that the non-EU Mediterranean countries may have comparative advantages over their European Union competitors (Vlachos 2001, Muaz 2004). Thus, the prospect of deepening trade within the region may be disadvantageous for certain sectors in the southern EU member countries. This may in particular be the case for the fruit and vegetable sectors and the potential deepening of the EMAs to improve trade in agricultural products has invoked fears in European horticultural regions (García Alvares-Coque 2002).

[1] So far, bilateral EMAs have been signed between the EU and Morocco, Algeria, Tunisia, Egypt, Israel, Jordan, Palestinian Territories, Lebanon and Syria. Concerning the two latter countries, the agreements have been negotiated or signed but are not yet implemented. Between Turkey and the EU, a customs union exists since 1995.

This paper aims to shed further light on the competitiveness of the non-processed fruit and vegetable sectors of some Mediterranean countries. More specifically, the sectors that are investigated belong to the harmonized system (HS) categories HS07 (vegetables) and HS08 (fruit). In order to gain a thorough understanding of the structure and development of the sectors in the countries, this paper has two foundations. Firstly, the importance of the sectors for the economies and their exports is assessed through presentation of a set of indicators such as Relative Unit Values (RUV) and Revealed Comparative Advantage (RCA). Additional information, including sector shares in national exports and per capita exports, is presented in order to give a broader picture of the importance of the sectors to the economies. Secondly, the trade performance of the fruit and vegetable sectors in the countries is analyzed through a constant market share (CMS) analysis. In this analysis, the development of exports is decomposed into four components: a market size effect, a commodity composition effect, a market distribution effect and a competitiveness effect. Through this process, it is possible to elaborate further on the issue if the countries are utilizing their potentials.

Nine Mediterranean countries have been selected for the analysis in paper: Morocco, Tunisia, Egypt, Israel, Jordan, Turkey, Cyprus, Greece and Spain. This choice is based on the countries' geographical proximity to the Mediterranean basin and on their economic structures. Algeria and Libya, for example, have been omitted since they mainly export oils. Greece and Spain serve to indicate the change of EU member countries' competitiveness in light of the increasing competition following EU trade liberalization.[2]

[2] It should be noted that Syria and the Palestinian Territories are not included in the analysis due to lack of available trade data.

1. Methodology

The RCA measure provides useful information about trade prospects and helps as one indication of a country's specialization with respect to specific commodities. Different measures of Revealed Comparative Advantage[3] exist but in this paper, the version developed by CEPII (1998) and used by ITC (2000) is utilized. It is defined as follows:

$$RCA_{icl}^{t} = \frac{1000}{X_{i..}^{t} + M_{i..}^{t}} \cdot \left[\left(X_{icl}^{t} - M_{icl}^{t} \right) - \left(X_{i..}^{t} - M_{i..}^{t} \right) \cdot \frac{\left(X_{icl}^{t} + M_{icl}^{t} \right)}{\left(X_{i..}^{t} + M_{i..}^{t} \right)} \right] \qquad (1)$$

With

cl being the set of commodities for which the RCA is calculated.

$X_{i..}^{t}$ and $M_{i..}^{t}$ being total exports and imports, respectively, for country *i* in year *t*.

X_{icl}^{t} and M_{icl}^{t} being total exports and imports, respectively, of country *i* for products belonging to the cluster *cl* in year *t*.

$\left(X_{icl}^{t} - M_{icl}^{t} \right)$ the observed trade imbalance of country *i* for the cluster *cl* in year *t*.

$\frac{\left(X_{icl}^{t} + M_{icl}^{t} \right)}{\left(X_{i..}^{t} + M_{i..}^{t} \right)}$ the weight of cluster *cl* in country *i* exports in year *t*.

$\left(X_{i..}^{t} - M_{i..}^{t} \right) \cdot \frac{\left(X_{icl}^{t} + M_{icl}^{t} \right)}{\left(X_{i..}^{t} + M_{i..}^{t} \right)}$ the theoretical imbalance of country *i* for the cluster *cl* in year *t*.

A value of less than zero implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds zero, the country is said to have a revealed comparative advantage in the product. The RCA is not primarily to be used for comparisons between countries but serves instead as an indicator of the level of specialization of a given sector within a given country.

The RUV indicator measures the average unit value of a country's exports in relation to the world average unit value. As the world average RUV equals unity, a RUV of less than unity implies that the country exports its products at a lower price than the world average unit price. Consequently, a country with a RUV higher than unity is exporting at a price higher than the

[3] RCA was first introduced by Balassa (1965).

world average price. A higher price than the world average implies one of two things. Either the products are homogeneous in which case a less competitive country will export at higher prices. Alternatively, according to new trade theories with heterogeneous products, a higher price reflects superior quality and thus cannot be viewed as an indicator of poor price competitiveness (ITC 2000).

The CMS analysis is a traditional tool that often has been used to deal with structural effects.[4] It is a relatively simple method to investigate growth rates and the traditional CMS model was first used to analyze international trade by Tyszynski (1951). The constant market share analysis has since been applied, in various versions, on many regions and periods. Some studies, e.g. Ballingall and Briggs (2001), Briggs *et al.* (2001) and Chaptea *et al.*. (2005), use CMS analysis to analyze countries' total competitiveness at an aggregated level. It is more common though to analyze certain sectors. Brownie and Dalziel (1993) perform the analysis at both aggregated and sector levels when they investigate New Zealand's export performance between 1970 and 1984. In a study that focuses on Belgium-Luxembourg, but that also incorporates the EU countries and other regions, Michel (2005) disaggregates the total effects with respect to contribution of commodities and regions. Juswanto and Mulyanti (2003) use CMS analysis to explain some export problems for the Indonesian manufacturing sector. Likewise, Drysdale and Lu (1996) assess Australia's export performance to East Asia for the period 1984-1994, dividing exports into manufactures, minerals/fuels and agricultural commodities. Hayward and Erickson (1995) investigates the potentials of NAFTA with respect to US producers, disaggregating trade at sector level as well as source by US state. Complementing the former study is Gazel and Schwer (1998), who also investigate the competitiveness of US states, and Markusen *et al.* (1991) who investigate US competitiveness

[4] The CMS method, also called shift-share analysis, is used in regional economics and geography to study the structural effects of regional variables such as employment and productivity. For more details on applications of shift-share analysis at the regional level, see Knudsen (2000).

at a regional level. Ahmandi-Esfahani (2006) also analyses Australia's export performance but with respect to the processed food sector's exports to South East Asia over the period 1980-2003.

In a study from 1971, Rigaux (1971) uses CMS analysis to investigate Canadian exports of wheat. Another CMS study focusing on wheat is Veeman *et al.* (1991), who investigates the export performance of major exporters, including the European Union, while Ahmadi-Esfahani (1993) analyses Egyptian wheat imports. In a CMS like analysis, García Alvarez-Coque and Bautista (1994) investigate the export performance of less developed countries for horticultural products to the European Union. They find that the main contribution to the LDC export growth to the EU in the periods 1975-1979 and 1985-1989 is due to the global import growth effect. The effect was however counteracted by a declining share of non-EU suppliers in EU consumption. Chebbi and Gil (2002) use the CMS method to analyze the competitive position of Tunisian dates exports to the European Union. EU demand has been stable and Tunisia is the main supplier to the EU, although French exports and re-exports are gaining in importance. Highly relevant for the study at hand is Martínez Gómez and Álvarez-Coque (2005) who investigate trade flows between the EU and some Mediterranean partners for the period 1995-1996 to 2000-2001. Their results will be further referred to in the conclusion section of this paper.

As mentioned above, the CMS analysis has been performed in various versions with some differences. The method has however often been criticized on the ground that it lacks a solid theoretical foundation (e.g. Houston 1967, Richardson 1971a,b), although Merkies and van der Meer (1988) display a such a foundation by relating the CMS analysis to a two-stage homothetic Armington (1969) demand model. The method chosen in this paper to decompose

the development of trade into four different components is based on Leamer and Stern (1970). That is also the version of the CMS that Merkies and van der Meer (1988) utilize when they support the theoretical foundation and thus it seems as a good choice to use in an applied study.

At the basis of the CMS analysis is always the assumption that a country's share of exports in world imports should be constant. If the share in world imports changes, there is a difference between the constant market share norm and the actual export performance. The actual export performance could then be disentangled into four components: a market size effect, a commodity composition effect, a market distribution effect and a competitiveness effect. In order to describe the trade decomposition, we need the following definitions:

$V_{i.}$ = value of A's exports of commodity *i* in period 1.

$V'_{i.}$ = value of A's exports of commodity *i* in period 2.

$V_{.j}$ = value of A's exports to country *j* in period 1.

$V'_{.j}$ = value of A's exports to country *j* in period 2.

V_{ij} = value of A's exports of commodity *i* to country *j* in period 1.

V'_{ij} = value of A's exports of commodity *i* to country *j* in period 2.

r = percentage increase in total world exports from period 1 to period 2.

r_i = percentage increase in world exports of commodity *i* from period 1 to period 2.

r_{ij} = percentage increase in world exports of commodity *i* to country *j* from period 1 to period 2.

ΔX_c = absolute change in exports of country A between period 1 and period 2.

These definitions imply that for period 1 we have:

$$\sum_j V_{ij} = V_{i.} \qquad \sum_i V_{ij} = V_{.j} \tag{2}$$

and likewise for period 2. Additionally, country A's exports in period 1 is given by:

$$\sum_i \sum_j V_{ij} = \sum_i V_{i.} = \sum_j V_{.j} = V_{..} \tag{3}$$

Assuming that exports are completely undifferentiated with respect to commodity and region of destination would, when applying the constant share norm, give us the following identity:

$$V'_{..} - V_{..} \equiv \Delta X_c \equiv r \cdot V_{..} + \left(V'_{..} - V_{..} - rV_{..}\right) \tag{4}$$

That is, if country A maintained its market share, then exports would increase by $r \cdot V_{..}$ and the growth in exports could be divided into one part associated with general increase in world exports and an unexplained residual, which is called the competitiveness effect. A positive competitiveness could be attributed to a decrease in a country's relative export price while a negative competitiveness likewise could be attributed to an increase in the country's relative export price.

With these definitions and identities in mind, we can now proceed to the complete decomposition identity. In this identity, we now consider exports to differ not only with respect to commodities, but also with respect to destination. The argument for the latter division is to take into account that some countries might have easy access to fast growing countries through historical patterns, geographic proximity or trade agreements while other countries do not. The identity equivalent to (4) then becomes

$$V'_{ij} - V_{ij} \equiv r_{ij} \cdot V_{ij} + \left(V'_{ij} - V_{ij} - r_{ij} \cdot V_{ij}\right) \tag{5}$$

which, at an aggregated level, is equal to:

$$\Delta X_c \equiv \sum_i \sum_j \left(V'_{ij} - V_{ij}\right) \equiv \sum_i \sum_j r_{ij} \cdot V_{ij} + \sum_i \sum_j \left(V'_{ij} - V_{ij} - r_{ij} \cdot V_{ij}\right) \equiv$$

$$\underbrace{r \cdot V_{..}}_{1} + \underbrace{\sum_i (r_i - r) \cdot V_{i.}}_{2} + \underbrace{\sum_i \sum_j (r_{ij} - r_i) \cdot V_{ij}}_{3} + \underbrace{\sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij} \cdot V_{ij})}_{4} \qquad (6)$$

As shown in identity (6), the total change in a country's exports, ΔX_c, is decomposed into four components:

> 1: **Market Size effect**, *MS*: The change in exports attributable to the general change in world exports. It is the hypothetical growth that would have occurred if the country had increased its exports at the same pace as world imports have increased.
>
> 2. **Commodity Composition effect**, *CC*: Measures whether the country in period 1 focused on commodities that grew relatively fast, or slowly, between period 1 and period 2. The value is positive if the country has concentrated its exports on commodities with growth rates that are higher than the world average. Similarly, the value is negative if the country has focused on slowly growing commodity markets.
>
> 3. **Market Distribution effect**, *MD*: Measures whether the country in period 1 focused on destination markets that experienced relatively rapid, or slow, growth between period 1 and period 2. The value is positive if the country has concentrated its exports to markets that are growing relatively fast and negative if they are growing relatively slowly.
>
> 4. **Competitiveness Effect**, *CE*: The residual reflects the difference between the actual export growth and the export that would have occurred had the country maintained its share in all markets for all commodities. A negative value implies that the country has failed to maintain market shares in all markets for all commodities, i.e. its competitiveness has decreased. A positive value means it has increased its market shares in all markets for all commodities, i.e. competitiveness has increased.

The first three effects indicate the growth that the country should have had if it had maintained its share in all markets for all commodities. The fourth effect, the competitiveness effect, may be calculated as a residual. If the value is negative, then the country grows slower than it should have given the constant market share norm. If the value is positive, the country grows faster than it would have given the constant market share norm. This implies that although the market size effect might imply that the country grows faster than the world and that it is increasing its market shares, it might still grow slower than it should have had it

maintained its market shares in all markets for all commodities. Thus, a country might display a negative competitiveness despite having increased its world market shares.

Beside the absolute values that are calculated above, relative values could facilitate interpretation as well as comparison between countries. When the relative values are calculated, the absolute effects are divided by the actual changes in exports the countries have experienced.[5] This kind of relative makes clarifies to what extent the different effects contribute to the total change in exports. However, the relative values create some complications, as will be clarified below, when the actual export change is negative. In those situations, in order to get the correct sign on the relative value and interpret the relative value correctly, absolute values of the changes may have to be used in the calculations. Taking the relative market size effect (*"MS%"*) as an example, the absolute value is always positive if world exports have increased over the period. If ΔX_c is > 0, then *"MS%"* > 100 implies that the change in country exports is smaller than the increase would have been had it followed the increase of world exports. Likewise, if ΔX_c is > 0, then *"MS%"* < 100 implies that the change in country exports is larger than the increase would have been had it followed the increase of world exports. Essentially, the smaller the value of *"MS%"*, the more the country increases its exports relative to the world. If, on the other hand, ΔX_c is < 0, then the absolute value of ΔX_c is used in order to get the correct sign on the relative effect. As the change in exports is negative, it is obvious that the country is loosing share in world markets but further information cannot be revealed. The interpretations of the relative effects could be summarized as in Table 1.

[5] For example, $MS\% = \left(MS / \Delta Xc\right)$. This follows the method of Leamer and Stern (1970) and has also been used by e.g. Veeman *et al.* (1991), Juswanto and Mulyanti (2003) and Drysdale and Lu (1996). It would have been possible to use some other reference; *e.g.* the changes in world trade that take place over the period (ITC 2000) or the initial world export market share (Michel 2005).

Table 1: General interpretation of relative effects associated with the CMS analysis.

Relative market size effect		
$\Delta X_c > 0$	*"MS%"* > 100	The lower *"MS%"*, the less its relative share in world markets declines.
$\Delta X_c > 0$	*"MS%"* < 100	The lower *"MS%"*, the more its relative share in world markets increases.
$\Delta X_c < 0$		Loses share in world markets.
Relative commodity composition effect		
$\Delta X_c > 0$	*"CC%"* > 0	The higher *"CC%"*, the more it is focused on fast growing commodities.
$\Delta X_c < 0$	*"CC%"* > 0	Indeterminate.
$\Delta X_c > 0$	*"CC%"* < 0	The lower *"CC%"*, the less focused it is on fast growing commodities.
$\Delta X_c < 0$	*"CC%"* < 0	The lower *"CC%"*, the less focused it is on fast growing commodities.
Relative market distribution effect		
$\Delta X_c > 0$	*"MD%"* > 0	The higher *"MD%"*, the more focused on fast growing partners
$\Delta X_c < 0$	*"MD%"* > 0	Indeterminate
$\Delta X_c > 0$	*"MD%"* < 0	The lower *"MD%"*, the less focused on fast growing partners.
$\Delta X_c < 0$	*"MD%"* < 0	The lower *"MD%"*, the less focused on fast growing partners.
Relative competitiveness effect		
The higher the value, above zero, the more the country has increased its competitiveness. The higher the value, below zero, the less the country has decreased its competitiveness.		

The differences between three periods have been investigated with the base period being the average of 1992-1993 for most countries.[6] The base period is 1993-1994 for Morocco and 1994-1995 for Egypt and Jordan. The second period is 1997-1998, which is also the initial period for Lebanon and Israel. 2002-2003 is the last period. The periods are henceforth referred to as P1, P2 and P3, respectively. These periods are suitable for several reasons. Four countries became members of the WTO in 1995[7], five of GAFTA[8] in 1998[9] and EMAs came

[6] Averages are used in order to smoothen random yearly effects and get more reliable results. Different periods are used for different countries due to lack of trade data.
[7] Tunisia, Israel, Morocco and Egypt.
[8] Greater Arab Free Trade Agreement.
[9] Tunisia, Morocco, Jordan, Egypt and Lebanon.

into effect for four countries[10] between P2 and P3. Thus, some important trade facilitating effects took place between periods and may be possible to capture in the analysis. The changes between P1 and P2 (Phase 1, '*P-1'*), P2 and P3 (Phase 2, '*P-2'*) and P1 and P3 (Phase Total, '*P-T*') are displayed in the tables.

The trade data that has been used in the calculations is from the COMTRADE database of the UN Statistics Division. As mentioned in the introduction, the data that has been used is for the sub-categories of HS07 and HS08 at the 4-digit level. That is, HS0701-HS0714 have been used for vegetables and HS0801-HS0814 have been used for fruit.[11] Two sets of analyses have been performed. In the first analysis, the natural choice has been to check the countries' competitiveness in world trade and used it as reference scenario. In a second stage, the investigated countries' competitiveness has been investigated with respect to trade with one major trading partner: the European Union, specified as EU15. It should be remembered however, that not all countries/commodities have a significant share of exports to that region. As can be seen in Table 3, Jordan is the most notable exception with a substantial share of exports not being directed towards member states of the EU. They are rather mostly directed to other Middle Eastern nations such as Saudi Arabia and the United Emirates.

Table 7, CMS I, presents the results of the CMS analysis with the world as base while Table 8, CMS II, presents it with the European Union as base in the calculations. The results for '*P-1'*, '*P-2'* and '*P-T*' are presented. The absolute change in exports is presented as ΔX. The decomposition is then presented as MS (market size effect), CC (commodity composition effect), MD (market distribution) and CE (competitiveness effect). Below the absolute values, relative values are calculated by dividing the value of the absolute effect by the change in

[10] Tunisia (1998), Israel (2000), Morocco (2000) and Jordan (2002).
[11] See Appendix 1 for descriptions of the various 4 digit HS categories.

exports. The relative effects are denominated by the abbreviation for the absolute effect followed by the symbol %.

2. Results

Export values and main outlets

Table 2 presents the most important vegetables and fruit with respect to export value. For use of comparison, one section of the table contains 'all agricultural commodities'. Some general patterns emerge: In the category 'vegetables', tomatoes and potatoes are very important commodities for most of the countries. Greece is the only country where neither of those products is included in the top three exports. In the category 'fruit', citrus fruit is the most important commodity for five of the countries and the second most important for Israel. Dates is the most important commodity for Israel (although with an export value only slightly higher than citrus fruit) and Tunisia while nuts is the most important for Turkey. Turkey has a relatively diversified export structure with citrus fruit and grapes being important as well. For some countries, Tunisia, Turkey, Greece and Spain, fruit exports dominate vegetable exports while the opposite being true for Egypt and Jordan.

Turning to the main outlets of the investigated countries' exports for the years 1997 and 2003, the right hand side of Table 3 presents the top destinations for vegetables. Some historical and/or geographic patterns emerge. The most important market for Moroccan and Tunisian exports in both periods is France. Countries in the Middle East are important markets for Jordan. For Egypt, Saudi Arabia was an important market in 1997, receiving 18% of exports. However, in 2003, the share had fallen to 12% and Italy had become the most important destination with a share of 15%. The United Kingdom is a very important market for Cyprus and Israel. Israel is also the only country that has a large share of its exports going to the

USA.[12] In 2003, Germany has become the most important destination market for Cyprus though. Exports from Spain and Greece are mainly shipped to Germany and other EU members in both periods. Germany is also a very important destination for Turkish exports, although Iraq has become the most important partner in 2003. In general, the shares of destination markets in exports are relatively stable between the two periods.

The left hand side of Table 3 presents the main destinations for fruit exports. In this case too, some historical and/or geographic patterns can be noticed. The most important market for Moroccan and Tunisian exports in both periods is France. Countries in the Middle East are important markets for Jordan. Likewise, in 1997 Saudi Arabia was a very important market for Egypt, receiving 24% of exports. In 2003, Russia had increased its share to 33% while Saudi Arabia had plummeted to 8%. The most important market for Israel and Cyprus is the United Kingdom, followed by other EU countries. Similarly, exports from Turkey, Spain and Greece are mainly shipped to Germany and other EU members. The shares of destination markets in exports are relatively stable between the two periods. One exception is Saudi Arabia as destination market for Jordanian exports. In 1997, Saudi Arabia was the top destination and imported 38% of Jordanian exports. The share had fallen to less than nine percent six years later as Jordan managed to diversify to other markets and decrease its dependence on Saudi Arabia. The creation of the free trade agreement Free Arab Trade Zone in 1999 is likely to have facilitated the process.

Other indicators

Regarding vegetables, most of the investigated countries display a positive trend in exports over the period 1995-2003 (Table 4). Tunisia, Greece and Jordan exhibit especially strong

[12] There has been a free trade agreement between the USA and Israel since 1985. In 1995, an agreement on trade in agricultural products was signed between the two countries. The agreement is, after revisions, valid until 2008 (Markou and Stavri, 2005).

annual growth rates, close to 10% on annual average. Morocco and Spain also perform well with growth rates close to 6%. Performing badly are Egypt and Greece with a slightly decreasing trend in exports. Cyprus performs the worst with exports declining at an average rate of 11% annually. Somewhat surprisingly, Cyprus is the country with the second highest share in national exports, 4.2%. The only other country with an equally high share is Jordan with 4.4%. Three other countries have shares in national exports higher than 2% but lower than 3%, namely Morocco, Syria and Spain. Egypt is close though with a share of 1.8%. For Tunisia, the share in national exports is negligible.

Interestingly, only two-thirds of the countries have positive vegetable net exports (Morocco, Israel, Jordan, Turkey, Cyprus and Spain). These countries are also the ones with the highest per capita exports (with Greece as an exception which has negative net exports but a per capita export of 10$/c). There is a large spread of per capita exports among those countries, ranging from 95$/c in Spain to Turkey that exports less than 10$/c. One of the countries, Spain, has an exceptionally high share in world markets, 14%. Only one other country, Turkey with 1.7%, has a world market share higher than 1%, although Morocco comes close with a share of 0.95%. This implies that except for Spain, and possibly Turkey, all Mediterranean countries have marginal shares in world exports.

Most of the countries display RCA values above unity for vegetables at an aggregated level (Table 5). The only country with a negative value is Tunisia with -0.9. Jordan stands out with a RCA value of 17.5, followed by Morocco, Cyprus and Spain that all have values between 10 and 13. The lowest of the remaining countries is Greece with a value of 1.4. Clearly, a majority of the countries display substantial revealed comparative advantages within the vegetable sector. When potatoes, tomatoes and cucumbers are investigated, the values are

much lower and even negative in some cases. Only a few countries and commodities remain with high values: Moroccan tomatoes, Jordanian tomatoes and Cypriote potatoes with RCA values of 6.4, 8.1 and 8.7, respectively.

Table 6 displays the relative unit values and their annual average rate of change between 1993 and 2003. For vegetables at an aggregated level, five of the countries display values substantially higher than unity while the remainder range from 0.42 for Egypt to 0.96 for Cyprus. All countries but Turkey and Egypt display a positive trend in RUV over the period. At the disaggregated level, the results are more diverse. Greece, for example, which has the highest aggregated value, has a negative trend and values at or below unity for potatoes and tomatoes while having a strongly positive trend for cucumbers.

Regarding fruit (Table 4), just over half of the countries have a positive trend of exports for the period 1995-2003. Three of the countries, Egypt, Spain and Morocco, diverge from the others with average annual growth rates of 9.4%, 4.4% and 3.9%, respectively. Tunisia and Turkey have growth rates of about 1.6%. The remainder displayed a decline in exports with Israel performing the worst with an average annual decline of -6.8%.

Despite the strong trend of exports for Egypt, fruit has a surprisingly low share in national exports, 0.7%, approximately the same level as Israel and Jordan. Fruit is slightly more important in Tunisia with a share of 1.2%. The remaining countries range from 3% to 4.4%. Although Cyprus has had a declining trend, it is apparent that fruit is still an important commodity for the country with respect to exports. It has the largest share in exports of the investigated countries: 4.4%.

Only one of the countries has a negative value of net exports, Jordan. The largest net exporter by far is Spain, followed by Turkey. The range of per capita exports range from almost zero in Egypt to 123 $/c for Spain. This latter country is followed by Cyprus, 51$/c, Greece, 41$/c, Israel, 30$/c, and Turkey, 20$/c. The two remaining countries, Morocco and Tunisia, are close to 10$/c. These values partly coincide with the share in world markets. Spain has the highest share, 14%. The second most important country is Turkey with a share of 3.9%. Greece is the only other country with a share higher than 1%, though Morocco is close with a share of slightly below 1%. The shares of the remaining countries are marginal.

All countries but Jordan display high and positive RCA values for the fruit sector (Table 5). Jordan has a negative value of -1.1, which stands in strong contrast to its RCA top position in the vegetable sector. Israel has the second lowest value of 1.8, followed by Tunisia with 5.2. The remaining countries range from 9.5 for Greece to 16.5 for Morocco. Clearly, a majority of the countries display substantial revealed comparative advantages within the fruit sector and in a majority of the cases, the RCA is higher for fruit than for vegetables. At the disaggregated level, all countries but Turkey display low or even negative values for nuts. For oranges, Morocco excels with a value of nearly 6 while Cyprus, Greece and Spain display values between 2.5 and 3.5.

For five of the countries, the RUV are above unity at an aggregated level (Table 6). Only one of the countries, Tunisia, has a value higher than 2 while the other's range from 1.1 to 1.5. Egypt has the lowest value of 0.4. The trend is clearly positive though for all countries but Egypt and Turkey. At the disaggregated level, the values are much closer to unity for most of the countries. Egypt is the exception with low values for both nuts and oranges. Tunisia too has a low value for nuts. Regarding oranges, Spain has the highest value of 1.6. The highest

RUV at the disaggregated level is Israeli dates with a value of 6.4, dates also being the most exported Israeli fruit. Dates is also an important fruit export for Tunisia, which displays a RUV of 2.2.

CMS analysis I

Vegetables

The upper part of Table 7 displays the absolute change in vegetable exports, the absolute CMS effects as well as the relative CMS effects. Egypt, Cyprus and Turkey display a poor absolute performance with declining exports over *'P-T'*. The lack of growth is serious since total world exports have increased: if the three countries had increased their exports by just the same ratio as world imports have increased, their exports would have increased substantially. This effect is reflected in the market size effect. Since the world market grows, all countries display a positive market size effect. Only Morocco, Jordan and Spain manage to increase exports faster than world growth though, resulting in *"MS%"* being lower than 100%. Of the growing countries, Tunisia increases its exports the least relative to the market size effect, thus having the highest *"MS%"*. Only three of the countries, Jordan, Spain and Greece, display positive commodity composition effects, indicating that they have focused their exports on relatively fast growing commodities. On the other end of the spectrum are Tunisia, Egypt and Turkey with highly negative values, indicating that those countries have focused their exports on slowly growing commodities. Morocco's and Cyprus' values are close to zero, indicating that the countries' export patterns are similar to the world average with respect to export growth. All countries display positive and high market distribution effects resulting in *"MD%"* values far above zero. Thus, all countries that increased their exports during *'P-T'* had concentrated their exports to countries that grew relatively fast. Surprisingly, all countries display a negative competitiveness effect. Spain and Morocco perform the best with *"CE%"* values of about -100%. As noted above, they manage to

increase exports at about the same rate as world exports grow. They do however not manage to utilize the advantage they had by initially exporting to countries that grew relatively fast over the period. Thus, Spain and Morocco would have had to increase their exports twice as much as they did in order to avoid a negative competitiveness effect. As can be seen in the table, all other countries perform far worse with respect to competitiveness.

Comparing the development of *'P-1'* with *'P-2'*, we find that the export development differs for many of the countries between the phases. The absolute export change is negative for Tunisia, Egypt and Jordan in the first phase but becomes positive in the second phase. Tunisia and Jordan display remarkable changes: in the second phase, the declining absolute exports have been transformed into an *"MS%"* value of 44% and 43% respectively, while the *"CE%"* values are -11% and -69%. Just over half of the countries for which there is data for both phases experience a decreasing competitiveness effect from phase one to phase two. Israel and Jordan, the two countries for which there is data only for phase two, have both focused their exports on slowly growing commodities but fast growing partners. Israel increases its exports faster than the world average though while Lebanon grows more slowly than the world average. Both countries have a negative competitiveness effect.

Fruit

The lower part of Table 7 displays the results of the CMS analysis for fruit. Notably, no conclusions can be deducted from the vegetable sector regarding how the countries perform in the fruit sector. Morocco, Tunisia and Spain have positive export changes for both types of products while Cyprus has a negative export change for both types of commodities. The other countries perform well for one of the commodities and poorly for the other. Jordan, Cyprus and Greece display a poor absolute performance with declining exports over *'P-T'*. In general,

the countries do not perform as well in the fruit sector as they did in the vegetable sector: Egypt is the only country that increases its exports that displays *"MS%"* lower than 100%, Morocco being the second best country with an *"MS%"* value of 148%. Likewise, the best relative competitiveness effects are clearly lower than those for vegetables are.

A major difference between fruit and vegetables is that in the fruit sector, several countries, including Morocco, Egypt, Turkey and Greece, switch from a positive change in exports in *'P-1'* to a negative in *'P-2'*. The three countries that have a positive change in exports in the second phase, Tunisia, Lebanon and Spain, increase their exports faster than the world average, resulting in *"MS%"* of 50%, 95% and 75%, respectively. The market distribution effect outweighs the market size effect though, resulting in a negative competitiveness effect. Spain is the country with the best relative competitiveness effect over the *'P-T'*, -207%, followed by Egypt of -300%. Out of the countries with a positive change in exports, Tunisia performs the worst with *"CE%"* of -820%.

Both of the countries that perform poorly in *'P-1'* with respect to absolute export changes have a negative export change in *'P-2'* as well. Tunisia and Spain are the only countries that continue to have positive export changes. The market distribution effect is positive for all countries in both phases. Regarding the commodity composition effect, all countries but Tunisia display a negative effect in the first phase. In the second phase, the pattern is more diverse as only half of the countries display a negative effect.

The country that improves the most from *'P-1'* to *'P-2'* is Tunisia. The relative market size effect falls from over 5000% to just less than 50%. At the same time does the *"CE%"* increase from -9500% to only -410%. Egypt, on the other hand, is one of the major losers: in

phase one, ΔX_c is positive and *"MS%"* only 34% with a *"CE%"* of -24%. In phase two, ΔX_c is substantially negative and *"CE%"* has decreased to -470%.

CMS analysis II

In the preceding section, the analysis has been based on exports to the world market. As clarified in the methodology section, there might however be good reasons to perform the CMS analysis on the regions that are the major trading partners. Since the EU member countries are the major export outlets for many of the Mediterranean countries, a separate CMS analysis has been performed on the investigated countries export performances to the European Union, defined as EU15. The results are displayed in Table 8.

Interestingly, there are few major changes. That is not particularly surprising though, considering that the European Union is a very large player in world trade, especially with respect to trade in fruit and vegetables (Huang 2004). There is one striking difference though: Two of the countries, Tunisia and Jordan, display a positive competitiveness effect for the vegetables sector over *'P-2'*. Investigating that result further, we find that both countries increase exports at more than twice the rate needed to keep up with the general increase in EU imports. That is, *"MS%"* is just below 40% for both countries. We further find that the two countries have had to deal with a disadvantage with respect to commodity composition. Tunisia and Jordan had a focus on slowly growing commodities in *'P-1'*, resulting in negative *"CC%"* equal to -35 and -19, respectively. On the other hand, both countries had an initial export pattern focusing on markets that were growing relatively fast. This is especially the case for Tunisia with a *"MD%"* of 56. The *"MD%"* for Jordan is lower and equal to 20. All factors taken together, Jordan had less help of initial export promoting patterns relative to its increase in exports and thus has a higher relative competitiveness effect than Tunisia. The

"CE%" of Jordan is 75, indicating that three quarters of its increase in exports is due to increasing competitiveness. For Tunisia, the value is only 25. As pointed to above, a large share of Tunisia's increase in exports stem from a favourable market distribution and only a quarter of the increase is attributable to increasing competitiveness.

3. Discussion and conclusions

Starting with the results from CMS I, one can immediately note that all countries perform poorly with respect to competitiveness for both commodities and all phases. The competitiveness effect is always negative, but the divergence between countries, phases and commodities is substantial.

Despite the negative competitiveness effect, most countries are doing well in the second phase, increasing exports of vegetables much faster than the constant market share norm. Only Cyprus and Turkey, which decrease exports, perform badly. The negative competitiveness effect is attributable to the market distribution effect: Although the countries grow faster than the world average, they should have increased exports even faster in order to keep up with the markets and commodities they are exporting. Contrasting to the initial phase, the export improvement is obvious: in the first phase, none of the countries grew faster than the world average. The recovery in the second phase secures that three out of eight countries manage to grow faster than the world over the entire phase.

The fruit sectors of the countries do not perform as well as the vegetable sectors. Furthermore, the fruit sectors generally do better in the first rather than the second phase. In the second phase, only three of the countries, Tunisia, Lebanon and Spain, display a positive growth in absolute terms. Those countries manage to grow much faster than the general world growth

though. Despite that, the competitiveness effect is negative for the same reasons as it was for the vegetable sectors. They perform well but not as well as they should have, the market distribution effects outweigh the absolute increase in exports. Contrasting to the first phase, six out of the eight countries display a positive growth but only one country grows faster than the world average. In that respect, the performances of the fruit sectors resemble those of the vegetable sectors.

In general, there are no major differences between using the world or the European Union as the base in the CMS analysis. The patterns are in general similar and there are only six instances when the absolute export change switches from positive to negative or vice versa. Clearly, the most interesting difference is that Jordan and Tunisia in the latter phase display a positive competitiveness for the vegetable sector. This implies that the choice of destination markets affects the results of the CMS analysis and that the analyst should consider the options. The results from the CMS analysis II of vegetables can be related to some of the results of Martínez Gómez and Álvarez-Coque (2005). Using different periods (1995/1996-2000/2001), they find the competitiveness effect of Egypt and Turkey to be negative over the period while the effects of Spain and Morocco are only slightly positive. One general conclusion of Martínez Gómez and Álvarez-Coque (2005), partly giving support to our results, is that European countries are losing competitiveness. More interesting though, is that they find the 'country preference effect', which corresponds to the market distribution effect, to be clearly positive for Spain, Egypt and Turkey. It is also evident that the choice of periods is important: for example, while the 1995/1996-2000/2001 phase shows a decline of 42% for Egyptian vegetable exports, phase two in our study displays a substantial increase in absolute terms.

Relating the revealed comparative advantage values to the CMS analysis for phase two, one can conclude that high and positive RCA values do not necessarily correspond to a positive competitiveness effects. Furthermore, the RCA values correspond poorly to relative market size effects. Indeed, in six cases in phase two, CMS I, do high RCA values correspond to increasing exports in absolute terms and *"MS%"* below 100. That is the same number of cases as those that display high RCA values and negative growth in absolute terms. Likewise, Tunisian vegetables, one of the countries/commodities that performs the best with low *"MS%"* and only slightly negative *"CE%"* when the world is the base and a positive *"CE%"* when the EU is the base, has the second worst RCA value of all countries/commodities. Clearly, high RCA values do not necessarily imply that countries manage to utilize their potentials.

The results of this study are somewhat surprising, as it would have been expected that more of the countries displayed a positive competitiveness. Since that is not the case, one has to ask why it might be that the countries, despite potentials, do not perform better. One general point in that case that is relevant for the non-European Union countries is the fact that the EU demands high sanitary standards on producers that wish to export to the union. The issue of food safety standards has been studied by Muaz (2005) that finds that there is a high cost involved in meeting the standards. There are several sources of those costs, including infrastructure and lack of qualified personnel. These costs may be one reason why the Mediterranean countries do not succeed as well in exporting as they could be expected to. Further studies are necessary though to safely assess the basis of the low competitiveness factor. The relatively poor competitiveness of the European Union member countries Spain and Greece could on the other hand be attributable to the very favorable treatment they have

by being members of the EU. Given the very positive influence access to the EU is bound to have on the countries, beating the market size and market distribution effects may be difficult.

To conclude, it appears as if most of the Mediterranean countries perform less well than they should be given their potentials. Although quite some countries manage to increase their share in world/EU imports, that is largely an effect of positive market distribution effects. Apparently, most of the countries depend on favorable historical export patterns for their successes in recent years. Without such an advantage, it is likely that the deterioration of the competitiveness would have led to less advantageous export changes.

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Appendix

Table 2: The most important agricultural commodities in export value in 2002 (US$ 1000).

	All agricultural commodities ¤	Export value	Vegetables*	HS code	Export value	Fruit*	HS code	Export value
MOR	Tang.Mand.Clem.Sats	110292	Tomatoes	0702	100357	Citrus fruit	0805	194449
	Tomatoes	100393	Leguminous veg	0708	34042	Fruits nes	0810	22759
	Oranges	83961	Vegetables nes	0709	24645	Fruits and nuts	0811	16904
TUN	Dates	68621	Tomatoes	0702	1889	Dates, figs etc	0804	68716
	Oil of Olive	39268	Vegetables dried	0712	1434	Citrus fruit	0805	8436
	Oil of Maize	30383	Vegetables nes	0709	574	Fruit, dried, nes	0813	3461
EGY	Cotton Lint	329698	Potatoes	0701	42808	Citrus fruit	0805	36521
	Milled Paddy Rice	103348	Onions, shallots etc	0703	24979	Dates, figs etc	0804	2946
	Potatoes	42617	Vegetables frozen	0710	20096	Grapes	0806	2171
ISR	Avocados	42703	Vegetables nes	0709	76274	Dates, figs etc	0804	58979
	Chillies&Peppers, Green	38306	Potatoes	0701	29456	Citrus fruit	0805	57909
	Vegetables Fresh nes	36790	Tomatoes	0702	27819	Fruits nes	0810	26225
JOR	Oils Hydrogenated	91858	Tomatoes	0702	59167	Melons	0807	5565
	Tomatoes	59167	Cucumbers	0707	22439	Citrus fruit	0805	5257
	Dry Skim Cow Milk	53107	Vegetables nes	0709	19559	Stone fruit	0809	2872
TUR	Hazelnuts Shelled	361003	Legumi. Veg. dried	0713	116268	Nuts exc coconut etc	0802	411336
	Tobacco Leaves	273209	Tomatoes	0702	69956	Citrus fruit	0805	253889
	Preprd Nuts(Excl.Grnuts)	169590	Vegetables nes	0709	36943	Grapes	0806	188779
CYP	Cigarettes	97433	Potatoes	0701	18189	Citrus fruit	0805	29983
	Potatoes	17882	Vegetables nes	0709	6499	Grapes	0806	1323
	Beverages Dist Alcoholic	11021	Legumi. Veg. dried	0713	212	Melons	0807	558
GRC	Oth. fruit & parts of plant	288349	Vegetables nes	0709	76154	Citrus fruit	0805	167504
	Tobacco unmanuf	232340	Cucumbers	0707	20796	Grapes	0806	102121
	Cotton lint	203956	Vegetables frozen	0710	11540	Stone fruit	0809	66575
ESP	Wine	1215237	Vegetables nes	0709	834192	Citrus fruit	0805	2174429
	Olive Oil virgin	1140931	Tomatoes	0702	777105	Fruits nes	0810	442533
	Tang. Mand Clem	956345	Lettuce & chicory	0705	392446	Stone fruit	0809	440092

Source * UNSTAT ¤FAO

Table 3: Main destination of exports

	Fruit 1997		Fruit 2003		Vegetables 1997		Vegetables 2003	
	Destination	Share	Destination	Share	Destination	Share	Destination	Share
MOR	France	30.7	France	21.6	France	63.3	France	67.0
	Germany	14.0	Russian Federation	20.9	Germany	4.3	Spain	12.8
	Russian Federation	12.4	United Kingdom	10.7	Japan	4.1	Italy	3.4
	United Kingdom	9.1	Netherlands	9.7	Italy	4.0	USA	2.8
	Belgium-Luxembourg	5.6	Belgium	6.9	Spain	3.9	Switzerland	2.5
TUN	France	42.0	France	40.8	France	47.4	France	52.4
	Italy	17.5	Italy	12.1	Germany	27.0	Italy	29.1
	Germany	9.2	Germany	9.9	Libya	12.3	Germany	11.8
	United Kingdom	7.2	Spain	8.6	Areas, nes	6.3	Libya	2.0
	Spain	6.3	Morocco	6.8	Belgium-Luxembourg	2.1	United Kingdom	1.4
EGY	Saudi Arabia	24.0	Russian Federation	33.3	Saudi Arabia	17.9	Italy	15.4
	Russian Federation	23.0	Belarus	12.1	United Kingdom	16.8	Germany	12.7
	United Kingdom	8.1	United Kingdom	8.9	Germany	14.3	Saudi Arabia	11.5
	Ukraine	5.8	Saudi Arabia	8.4	Lebanon	10.0	Greece	8.9
	Kuwait	4.8	Ukraine	7.9	Italy	6.3	Russian Federation	7.4
ISR	United Kingdom	23.8	United Kingdom	24.4	United Kingdom	22.9	United Kingdom	27.8
	Belgium-Luxembourg	15.7	France	16.1	USA	17.6	Netherlands	21.5
	France	14.0	Netherlands	11.9	Netherlands	17.5	USA	17.3
	Japan	8.2	Germany	6.1	Germany	11.3	Germany	8.1
	Germany	5.0	Belgium	5.2	France	11.2	France	6.0
JOR	Saudi Arabia	37.7	Syria	15.6	United Arab Emirates	33.8	United Arab Emirates	32.2
	United Arab Emirates	23.1	Kuwait	14.0	Kuwait	20.7	Syria	19.1
	Kuwait	13.5	Lebanon	12.3	Lebanon	20.4	Kuwait	12.8
	Qatar	10.9	Bahrain	9.6	Qatar	11.8	Bahrain	8.4
	Bahrain	8.4	United Arab Emirates	9.1	Bahrain	9.2	Qatar	8.1
TUR	Germany	31.1	Germany	18.3	Areas, nes	22.0	Iraq	13.5
	Italy	10.0	Italy	10.9	Germany	9.3	Germany	10.5
	United Kingdom	8.2	Russian Federation	8.6	Russian Federation	8.7	Russian Federation	8.8
	France	6.7	United Kingdom	7.9	Saudi Arabia	6.6	Saudi Arabia	5.4
	Netherlands	5.7	France	7.1	Egypt	4.7	Greece	4.7
CYP	United Kingdom	37.9	United Kingdom	29.8	United Kingdom	41.5	Germany	35.3
	Germany	13.9	Germany	14.4	Germany	34.7	United Kingdom	30.1
	Italy	6.9	Czech Rep.	10.5	Belgium-Luxembourg	7.0	Belgium	9.4
	Austria	6.4	Italy	8.5	Norway	4.1	Greece	5.9
	France	4.8	Slovakia	6.1	Denmark	2.5	Norway	4.6
GRC	Germany	20.6	Germany	19.2	Germany	62.7	Germany	50.2
	United Kingdom	17.7	United Kingdom	12.1	Italy	14.5	Italy	14.2
	Netherlands	9.3	Poland	7.1	Netherlands	4.2	United Kingdom	6.2
	Russian Federation	8.1	Netherlands	6.5	Bunkers	3.3	Austria	4.3
	Italy	7.0	Italy	6.3	Albania	3.1	Netherlands	4.0
ESP	Germany	27.5	Germany	24.2	Germany	24.6	Germany	27.1
	France	23.0	France	23.5	United Kingdom	19.3	United Kingdom	19.2
	Italy	9.9	Italy	9.9	France	18.7	France	18.6
	United Kingdom	8.6	United Kingdom	9.7	Netherlands	17.0	Netherlands	11.1
	Netherlands	8.5	Netherlands	6.6	Italy	4.8	Italy	5.7

Source: COMTRADE data

Table 4: Trade performance and specialization.

Data for 2003 unless otherwise stated		MAR	TUN	EGY	ISR	JOR	TUR	CYP	GRC	ESP
Vegetables HS 07	Value of exports ($ 000)	256600	5283	133600	235500	136600	473300	38988	111400	3888000
	Trend of exports (95-03) p.a.	5.63%	9.87%	-3.26%	10.47%	8.87%	2.87%	-11.36%	-1.81%	6.60%
	Share in national export	2.92%	0.07%	1.78%	0.75%	4.43%	1.00%	4.22%	0.81%	2.46%
	Value of net exports ($ 000)	223110	-19827	-30674	191415	102811	443245	26254	-78009	3173813
	Per capita exports ($/inhb)	8.39	0.54	1.86	36.61	24.96	6.64	48.61	10.15	94.68
	Share in world market	0.95%	0.02%	0.50%	0.88%	0.51%	1.76%	0.14%	0.41%	14.45%
Fruit HS 08	Value of exports ($ 000)	320600	87537	52522	191800	20015	1392000	40599	445100	5047000
	Trend of exports (95-03) p.a.	3.94%	1.73%	9.39%	-6.79%	-1.06%	1.52%	-0.84%	-1.72%	4.43%
	Share in national export	3.65%	1.19%	0.70%	0.60%	0.65%	2.95%	4.40%	3.26%	3.19%
	Value of net exports ($ 000)	297078	75775	14586	109523	-30703	1311642	27898	168480	3820819
	Per capita exports ($/inhb)	10.49	8.90	0.73	29.81	3.66	19.52	50.62	40.55	122.91
	Share in world market	0.90%	0.25%	0.15%	0.54%	0.06%	3.90%	0.11%	1.25%	14.14%

Source: COMTRADE

Table 5: RCA indices for selected fruit and vegetables.

	Fruit	Nuts	Oranges	**Vegetables**	Potatoes	Tomatoes	Cucumbers
	HS 08	HS 0802	HS 080510	HS 07	HS 0701	HS 0702	HS 0707
Morocco	16.46	0.23	5.87	12.69	-0.02	6.4	0.07
Tunisia	5.24	-0.19	0.61	-0.86	-0.76	0.15	0.00003
Egypt	na	na	na	na	na	na	na
Israel	1.81	-0.72	0.2	3.06	0.45	0.62	0.004
Jordan	-1.13	-0.94	-0.64	17.51	-0.39	8.1	3.15
Turkey	13.65	4.51	0.56	4.62	0.13	0.9	0.11
Cyprus	11.68	-0.09	2.58	11.18	8.74	-0.001	0.008
Greece	9.45	-0.27	3.52	1.41	-0.28	-0.13	0.43
Spain	12.78	0.09	2.83	10.38	-0.11	2.69	0.96

Source: ITC

Table 6: The Relative Unit Value in 2003 and its average annual change 1993 – 2003

		Morocco	Tunisia	Egypt	Israel	Jordan	Turkey	Cyprus	Greece	Spain
Vegetables	RUV	1.56	2.25	0.42	2.63*	0.78	0.85	0.96	3.15	2.15
HS07	avr change	3.77%	5.63%	-3%+	2.1%β	1%+	-0.37%	3.09%	5.48%	0.86%
Potatoes	RUV	1.7	1.8	0.8	1.5*	1.6	0.4	1.7	1.0	1.5
HS0701	avr change	0.2%	4.3%	-2.1%	3.5%β	-0.5%	-3.2%	-3.0%	-8.3%	-2.0%
Tomatoes	RUV	0.9	1.7	0.4	2.8*	0.4	0.5	1.8	0.5	1.3
HS0702	avr change	4.8%	11.4%	2.2%+	2.3%β	2.3%+	-0.1%	-0.7%	-1.8%	3.4%
Cucumbers	RUV	0.8	1.0	0.8	3.5*	0.9	3.3	4.5	3.1	2.0
HS0707	avr change	2.0%	0.1%	1.5%	10.8%β	3.5%	20.9%	20.9%	16.9%	7.6%
Fruit	RUV	0.89	2.30	0.37	1.22*	0.66	1.48	0.80	1.07	1.38
HS08	avr change	6.27%	0.98%	-4%+	6.4%β	2%+	-1.85%	2.83%	4.82%	3.19%
Nuts	RUV	1.1	0.5	0.2	na	1.2	1.0	1.2	1.3	1.3
HS0802	avr change	-1.3%	-5.1%	7.33%+	na	0.0%	0.3%	3.5%	-1.4%	-3.5%
Dates	RUV	0.93	2.20	0.38	6.14*	0.67	0.67	3.15	2.92	3.07
HS080410	avr change	4.6%	5.2%	3.7%+	8.0%β	8.6%+	13.2%		5.1%	4.6%
Oranges	RUV	1.0	1.2	0.4	1.1*	1.0	0.8	1.2	1.1	1.6
HS080510	avr change	0.5%	14.0%	-3.6%	5.6%β	-1.0%	-1.1%	0.9%	4.0%	1.1%

* 2000 + Avg annual change 1994-2003 β Avg annual change 1996-2000

Source: COMTRADE

Table 7: CMS analysis I, World base.

			Morocco	Tunisia	Egypt	Israel	Jordan	Lebanon	Turkey	Cyprus	Greece	Spain
Vegetables HS 07	Period 1 - Period 3	ΔXc	112 000	446	-7 099		26 600		-11 700	-20 100	35 500	1 810 000
		MS	88 100	3 905	40 400		22 100		344 000	46 700	75 500	1 590 000
		CC	-1 534	-337	-27 000		7 656		-31 600	-518	3 288	486 000
		MD	140 000	1 831	140 000		87 100		366 000	59 500	64 400	1 640 000
		CE	-114 000	-4 953	-161 000		-90 200		-689 000	-126 000	-108 000	-1 910 000
		MSrel	78.55	876.18	569.76		83.07		2946.75	232.87	213.03	87.91
		CCrel	-1.37	-75.56	-380.74		28.74		-271.41	-2.58	9.27	26.90
		MDrel	124.76	410.85	1975.71		326.97		3136.02	296.78	181.58	90.89
		CErel	-101.94	-1111.47	-2264.72		-338.78		-5911.36	-627.07	-303.89	-105.70
	Period 1 - Period 2	ΔXc	61 100	-1 773	-25 000		-25 400		9 629	-15 700	34 700	995 000
		MS	73 000	1 232	7 202		2 987		220 000	19 200	69 100	1 620 000
		CC	-27 600	1 261	-15 200		2 790		16 800	12 100	-25 600	-464 000
		MD	141 000	5 362	128 000		66 100		276 000	55 700	72 700	1 710 000
		CE	-126 000	-9 628	-145 000		-97 300		-503 000	-103 000	-81 600	-1 880 000
		MSrel	119.50	69.50	28.75		11.76		2288.14	122.58	199.10	163.06
		CCrel	-45.20	71.12	-60.83		10.98		173.96	77.03	-73.70	-46.62
		MDrel	231.30	302.41	509.83		260.19		2863.30	356.15	209.49	172.21
		CErel	-205.60	-543.02	-577.75		-382.93		-5225.40	-655.77	-234.89	-188.65
	Period 2 - Period 3	ΔXc	51 100	2 219	17 900	53 900	52 000	2 763	-21 300	-4 398	741	813 000
		MS	57 100	982	27 700	45 800	22 500	4 226	76 400	6 057	25 700	790 000
		CC	-6 318	-489	-10 400	-10 100	-10 100	-849	-34 100	44	8 020	68 600
		MD	150 000	1 970	109 000	159 000	75 800	23 500	372 000	34 000	104 000	2 470 000
		CE	-150 000	-245	-108 000	-141 000	-36 200	-24 100	-436 000	-44 500	-137 000	-2 520 000
		MSrel	111.80	44.24	154.19	84.93	43.32	152.96	358.90	137.73	3468.63	97.11
		CCrel	-12.37	-22.02	-58.11	-18.66	-19.39	-30.72	-160.12	1.00	1081.97	8.43
		MDrel	293.53	88.81	605.95	294.77	145.59	850.94	1747.50	772.62	13976.81	303.92
		CErel	-292.96	-11.03	-602.03	-261.05	-69.52	-873.17	-2046.28	-1011.35	-18427.41	-309.45

			Morocco	Tunisia	Egypt	Israel	Jordan	Lebanon	Turkey	Cyprus	Greece	Spain
Fruit HS 08	Period 1 - Period 3	ΔXc	83 200	20 800	9 215		-15 800		366 000	-6 849	-16 600	1 690 000
		MS	123 000	73 500	8 435		9 572		932 000	42 700	527 000	3 160 000
		CC	-41 600	45 600	812		-2 478		-16 400	-15 600	-9 986	-628 000
		MD	168 000	72 400	27 600		34 700		936 000	56 700	700 000	2 670 000
		CE	-166 000	-171 000	-27 700		-57 600		-1 490 000	-90 600	-1 230 000	-3 510 000
		MSrel	147.70	352.92	91.53		60.47		254.78	623.89	3167.70	186.17
		CCrel	-50.02	218.81	8.81		-15.65		-4.47	-228.51	-60.07	-37.08
		MDrel	202.19	347.35	299.83		219.30		255.72	827.45	4209.94	157.74
		CErel	-199.87	-819.07	-300.18		-364.12		-406.03	-1322.84	-7417.57	-206.83
	Period 1 - Period 2	ΔXc	104 000	1 310	22 600		-4 150		394 000	-6 695	48 600	1 080 000
		MS	130 000	60 500	7 635		3 614		1 010 000	25 700	473 000	3 600 000
		CC	-71 900	4 730	-3 545		-165		-367 000	-5 297	-105 000	-1 720 000
		MD	166 000	59 800	23 900		25 700		952 000	50 300	674 000	2 830 000
		CE	-120 000	-124 000	-5 337		-33 300		-1 200 000	-77 400	-993 000	-3 630 000
		MSrel	124.78	4616.69	33.76		87.09		255.57	383.66	973.84	332.94
		CCrel	-69.00	360.98	-15.67		-3.98		-93.18	-79.12	-216.65	-158.69
		MDrel	159.75	4560.82	105.51		619.11		241.61	751.71	1387.28	261.61
		CErel	-115.53	-9438.49	-23.60		-802.22		-304.00	-1156.24	-2044.46	-335.86
	Period 2 - Period 3	ΔXc	-21 000	19 500	-13 400	-64 300	-11 700	3 623	-28 200	-154	-65 200	613 000
		MS	43 300	9 706	5 560	31 300	1 787	3 430	199 000	5 077	49 100	503 000
		CC	-15 800	17 200	-332	15 400	824	-3	14 900	-1 863	32 300	-4 589
		MD	270 000	72 200	44 500	231 000	26 600	36 600	1 140 000	31 600	479 000	3 660 000
		CE	-318 000	-79 600	-63 100	-342 000	-40 900	-36 400	-1 380 000	-35 000	-625 000	-3 550 000
		MSrel	206.24	49.71	41.49	48.69	15.30	94.68	707.49	3306.77	75.31	82.12
		CCrel	-75.09	88.25	-2.48	23.90	7.05	-0.08	52.76	-1213.82	49.60	-0.75
		MDrel	1285.78	369.76	332.04	359.01	227.91	1009.15	4053.67	20584.50	734.18	597.82
		CErel	-1516.93	-407.72	-471.05	-531.60	-350.26	-1003.75	-4913.92	-22777.45	-959.09	-579.19
	Baseperiod		9394	9293	9495		9495		9293	9293	9293	9293

Absolute values are in 1000 US$

MS - market size effect. CC - commodity distribution effect. MD - market distribution effect. CE - competitiveness effect.

Source: COMTRADE data

Table 8: CMS analysis II, EU base.

			Morocco	Tunisia	Egypt	Israel	Jordan	Lebanon	Turkey	Cyprus	Greece	Spain
Vegetables HS 07	Period 1 - Period 3	ΔXc	95 300	1 251	-15 800		50		9 561	-20 300	29 100	1 670 000
		MS	80 900	2 480	15 400		889		117 000	32 100	59 600	1 360 000
		CC	5 916	538	-19 400		80		-21 300	19 100	4 654	653 000
		MD	127 000	1 737	81 100		2 135		138 000	46 700	49 900	1 490 000
		CE	-118 000	-3 504	-92 900		-3 054		-224 000	-118 000	-85 100	-1 840 000
		MSrel	84.98	198.25	97.45		1768.16		1220.25	158.19	204.67	81.60
		CCrel	6.21	43.03	-122.96		159.30		-222.77	94.22	15.98	39.12
		MDrel	133.21	138.87	513.35		4244.73		1444.42	230.07	171.42	89.30
		CErel	-124.40	-280.15	-587.84		-6072.19		-2341.91	-582.48	-292.06	-110.03
	Period 1 - Period 2	ΔXc	34 500	-1 072	-22 400		-1 688		-18 100	-16 200	34 600	912 000
		MS	58 400	898	-372		22		62 400	11 700	56 500	1 370 000
		CC	-12 700	1 149	-12 600		193		21 300	25 600	-20 600	-234 000
		MD	129 000	2 715	78 600		1 955		122 000	45 700	61 100	1 570 000
		CE	-140 000	-5 835	-88 100		-3 858		-224 000	-99 300	-62 400	-1 790 000
		MSrel	168.93	83.75	-1.66		1.32		344.16	72.09	163.40	149.95
		CCrel	-36.90	107.13	-55.97		11.44		117.36	157.95	-59.69	-25.64
		MDrel	372.76	253.18	350.16		115.83		674.95	281.64	176.92	171.80
		CErel	-404.79	-544.07	-392.53		-228.59		-1236.46	-611.68	-180.64	-196.12
	Period 2 - Period 3	ΔXc	60 700	2 323	6 639	37 700	1 738	255	27 700	-4 076	-5 422	757 000
		MS	50 000	866	12 800	31 100	683	108	30 100	5 115	21 000	693 000
		CC	-5 206	-441	-5 681	-3 123	-598	-119	-18 000	-14	10 000	90 100
		MD	123 000	1 308	59 100	115 000	343	348	113 000	28 300	89 700	2 350 000
		CE	-107 000	590	-59 600	-105 000	1 310	-81	-97 100	-37 500	-126 000	-2 370 000
		MSrel	82.35	37.27	192.36	82.43	39.29	42.18	108.76	125.49	386.46	91.57
		CCrel	-8.57	-18.97	-85.57	-8.28	-34.40	-46.76	-64.94	-0.36	184.94	11.90
		MDrel	203.10	56.30	890.25	305.01	19.75	136.49	406.90	695.02	1653.89	310.05
		CErel	-176.87	25.40	-897.03	-279.16	75.35	-31.91	-350.73	-920.15	-2325.29	-313.53

			Morocco	Tunisia	Egypt	Israel	Jordan	Lebanon	Turkey	Cyprus	Greece	Spain
Fruit HS 08	Period 1 - Period 3	ΔXc	19 600	10 300	3 189		-457		109 000	-6 648	-114 000	1 390 000
		MS	81 400	55 600	1 112		66		694 000	33 600	396 000	3 060 000
		CC	-26 400	73 100	-376		0		-71 200	-16 800	4 602	-767 000
		MD	146 000	47 200	4 568		434		598 000	48 400	278 000	2 270 000
		CE	-181 000	-166 000	-2 115		-957		-1 110 000	-71 900	-792 000	-3 170 000
		MSrel	415.28	542.87	34.86		14.43		638.42	506.14	347.48	220.05
		CCrel	-134.43	713.12	-11.78		0.00		-65.57	-252.31	4.04	-55.16
		MDrel	744.12	460.54	143.24		95.11		550.12	727.94	244.11	163.20
		CErel	-924.97	-1616.53	-66.33		-209.54		-1022.97	-1081.77	-695.63	-228.08
	Period 1 - Period 2	ΔXc	50 600	399	-309		142		260 000	-4 761	12 500	942 000
		MS	94 800	47 300	589		68		829 000	24 000	396 000	3 820 000
		CC	-45 100	32 900	-118		-16		-293 000	-7 890	-24 400	-1 860 000
		MD	134 000	37 300	4 522		491		602 000	40 500	314 000	2 270 000
		CE	-133 000	-117 000	-5 302		-402		-878 000	-61 300	-646 000	-3 290 000
		MSrel	187.54	11842.73	190.55		48.31		318.96	503.84	2950.98	405.35
		CCrel	-89.23	8245.19	-38.06		-11.21		-112.62	-165.71	-195.41	-197.78
		MDrel	264.39	9331.48	1464.07		346.67		231.70	850.30	2518.41	241.13
		CErel	-262.70	-29319.40	-1716.57		-283.76		-338.04	-1288.42	-5173.98	-348.70
	Period 2 - Period 3	ΔXc	-31 000	9 851	3 498	-37 400	-598	84	-151 000	-1 886	-126 000	448 000
		MS	9 354	5 545	733	11 600	0	19	67 500	2 246	12 200	232 000
		CC	-3 792	13 800	-570	13 700	15	5	-19 600	-1 937	7 533	2 300
		MD	196 000	60 400	3 774	182 000	553	208	855 000	27 700	301 000	3 430 000
		CE	-232 000	-69 900	-439	-244 000	-1 167	-148	-1 050 000	-29 900	-447 000	-3 210 000
		MSrel	30.21	56.29	20.95	31.05	0.05	23.02	44.68	119.05	9.65	51.86
		CCrel	-12.25	139.73	-16.31	36.69	2.57	5.69	-12.98	-102.71	5.96	0.51
		MDrel	632.46	613.34	107.91	485.63	92.40	246.73	565.38	1469.68	238.36	765.48
		CErel	-750.42	-709.35	-12.55	-653.37	-195.02	-175.44	-697.07	-1586.03	-353.97	-717.86
Baseperiod			9394	9293	9495		9495		9293	9293	9293	9293

Absolute values are in 1000 US$

MS - market size effect. CC - commodity distribution effect. MD - market distribution effect. CE - competitiveness effect.

Source: COMTRADE data

Appendix 1: Categories of Vegetables and Fruit in the Harmonized System.

Vegetables	
0701	Potatoes, fresh or chilled
0702	Tomatoes, fresh or chilled
0703	Onions, shallots, garlic, leeks, etc. fresh or chilled
0704	Cabbage, cauliflower, kohlrabi & kale, fresh, chilled
0705	Lettuce and chicory, fresh or chilled
0706	Carrots, turnips, beetroot, etc. fresh or chilled
0707	Cucumbers and gherkins, fresh or chilled
0708	Leguminous vegetables, fresh or chilled
0709	Vegetables nes, fresh or chilled
0710	Vegetables (uncooked, steamed, boiled) frozen
0711	Vegetables provisionally preserved, not ready to eat
0712	Vegetables, dried, not further prepared
0713	Vegetables, leguminous dried, shelled
0714	Manioc, rowroot, salep etc, fresh, dried, sago pith
Fruit	
0801	Coconuts, Brazil nuts and cashew nuts, fresh or dried
0802	Nuts except coconut, brazil & cashew, fresh or dried
0803	Bananas, including plantains, fresh or dried
0804	Dates, figs, pineapple, avocado, guava, fresh or dried
0805	Citrus fruit, fresh or dried
0806	Grapes, fresh or dried
0807	Melons, watermelons and papaws (papayas), fresh
0808	Apples, pears and quinces, fresh
0809	Stone fruit, fresh (apricot, cherry, plum, peach, etc
0810	Fruit nes, fresh
0811	Fruit and nuts, uncooked boiled or steamed, frozen
0812	Fruit, nuts provisionally preserved, not ready to ea
0813	Fruit, dried, nes, dried fruit and nut mixtures
0814	Peel of citrus fruit or melons