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## Sources of EC horticultural import growth from developing countries

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### Abstract

A decomposition analysis of horticultural trade flows is carried out to identify the main sources of change in EC horticultural imports from different LDC regions. Sources of change are associated with each region's international competitiveness, the relative openness of the EC market, the degree of trade preference enjoyed by the region, and the EC global import growth. The main contribution to the LDC export growth of fruit and vegetables to EC between 1975–79 and 1985–89 is found to be attributable to the global import growth effect. However, it has been significantly counteracted by the negative effect of a declining share of non-EC suppliers as a group. Marked interregional differences in changes in regional preferences show a lack of a strong correlation between LDC export performance and the existence of preferential trade agreements with EC. While the potential for LDC export growth to EC is clear, the results seem to indicate that in general EC protection policies have adversely affected import growth from LDCs. Various factors influencing LDC export performance in horticultural products are discussed. Apart from EC protection policies and changes in trade preferences, domestic supply factors are of significance in explaining export growth, including a liberal trading environment, but also specific policies to promote exports of horticultural products. While non-price competition weakens the discriminatory effect of preferential tariffs, there is a pressing need for developing countries to adapt to the demands of the European distribution system relating to quality, grades, and regularity of supplies.

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### 1. Introduction

Horticultural products represent an increasingly important source of export earnings for many developing countries (LDCs). Between 1975

and 1985, LDC exports of fruits and vegetables grew at an annual compound rate of 8.3% (in US\$ value terms), significantly exceeding the corresponding growth rate of 5.2% for total agricultural exports (Islam, 1990, p. 15). The contribution of non-traditional horticultural exports to agricultural diversification and employment expansion is also likely to be significant, contribut-

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Table 1  
Share of EC in total horticultural exports of developing countries (percent)

	1962/65	1971/75	1981/84	1985/89
Mediterranean Basin	69.9	64.1	52.0	58.0
Africa	71.8	50.9	57.1	65.1
Latin America	28.5	21.5	26.6	32.1
Asia	39.2	47.5	46.4	40.1
All developing countries	48.7	42.9	39.0	41.5

Source: UN Trade data tapes.

*Mediterranean Basin:* Algeria, Tunisia, Morocco, Israel, Jordan, Turkey, Yugoslavia, Egypt.

*Africa:* Sudan, Cameroon, Angola, Zaire, Benin, Ethiopia, Ghana, Cote d'Ivoire, Kenya, Madagascar, Malawi, Mali, Niger, Nigeria, Senegal, Sierra Leone, Somalia, Uganda, Tanzania, Burkina Faso.

*Latin America:* Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, Venezuela, Guatemala, Honduras, Nicaragua, Dominican Republic.

*Asia:* Iran, Iraq, Saudi Arabia, Syria, Afghanistan, Bangladesh, Burma, Sri Lanka, Hong Kong, India, Indonesia, Korea Republic, Malaysia, Pakistan, Philippines, Thailand.

ing to the structural transformation of predominantly agrarian economies (Johnston, 1970).

LDC horticultural exports have depended heavily on developed country markets. Based on FAO trade data, roughly 80% of LDC exports of fruits and vegetables went to developed countries during the first half of the 1980s, of which about one-half was accounted for by the European Community (defined in this paper to include only the former 9 members). In fact, the EC share in LDC horticultural exports declined from an average 48.7% in 1962–65 to 42.9% in 1971–75, and around 40% in the eighties (Table 1). On the other hand, the average growth of EC horticultural imports from LDCs was faster than that from all non-EC suppliers (7.0% versus 6.2%).

There has been little systematic examination of the EC as a market for LDC exports of horticultural products (for a recent review, see Hinton, 1991). While some studies have been done on the impact of the southern enlargement of the EC on world markets for fruits and vegetables (Sarris, 1984; Alvensleben et al., 1986), and on the effects of EC policies on horticultural trade with developing Mediterranean countries (e.g.,

Ritson and Swinbank, 1991), the focus has been on temperate-zone products – which are not of export interest to most developing countries. The effects of trade preferences granted by the EC to particular groups of developing countries have also received some attention, as reviewed in Brown (1988), but which do not sufficiently emphasize LDC exports of fruits and vegetables.

In the next section of this paper, we briefly discuss EC policies and regulations that would have affected imports of fruits and vegetables from developing countries. A framework is then developed for decomposing the observed change in the value of an LDC region's exports of horticultural products to the EC market into components that can be associated with changes in the region's international competitiveness, the relative openness of the EC market, the degree of trade preference enjoyed by the region, and the total EC imports of fruits and vegetables. The following two sections present and discuss the results of the decomposition analysis for the period 1975–79 to 1985–89, with special attention given to the relative performance of preference-beneficiary regions. The paper ends with a brief summary of findings and their implications for the prospects of LDC horticultural exports to the EC market.

## 2. EC trade and agricultural policies for fruits and vegetables

Market access of a particular developing country to the EC is determined by the combined effects of border measures and trade preferences. Border measures, which protect domestic producers from all foreign suppliers, are a consequence of political pressures for EC governments to promote self-sufficiency. Trade preferences are an instrument of EC policy towards different regional country groups, primarily influenced by historical and geopolitical factors.

### 2.1. Border measures

Imports of fruits and vegetables from non-EC countries are subject to tariffs that are specific to

products, seasons, and countries. Tariff rates are very low for products not directly competing with domestic production (such as tropical fruits like coconut, mango and papaya) and for those included in bilateral or multilateral agreements (such as dried legumes, nuts and grapefruit). Tariff rates for fresh products are low during seasons when there is no domestic supply of competing products; for example, the rate of import duty on oranges imported from non-preferred suppliers ranges from 20% in the months from October to May to 4% in other months. Import duties are higher for processed fruits and vegetables, which can reach 42% and even higher levels for some fruit juices, with extra-duty for products with high sugar content. For example, the tariff rate for fresh pineapple is 9%, which increases to 19% for low-density pineapple juice, and to 42% for high-density juice.

Tariffs are complemented by internal regulations designed to protect EC producers from foreign price instability. For a number of fresh products, 'reference prices' differentiated by season and quality standards are set on an annual basis. 'Entry prices' (export prices adjusted for transport costs to the border and net of non-preferential custom's duty) are calculated daily at certain markets in the EC. If the entry price falls below the reference price by a certain amount for a given number of days, the Commission imposes a countervailing charge equal to the difference between the entry price and the reference price. This system serves to further protect EC producers from third country competition. The list of products covered by the system has increased during the 1980s and now includes ten fruits (oranges, mandarins, lemons, table grapes, pears, apples, peaches, apricots, cherries and plums) and six vegetables (tomatoes, zucchini, cabbage, lettuce, cucumber, artichoke and eggplant).

'Minimum prices' are also set for some products processed from fresh fruits and vegetables, preventing the marketing of imported products at low prices. Dried grapes, frozen cherries, grape juice, and pears in syrup are examples of processed horticultural products subject to minimum import prices.

Since the mid-1970s, import licenses and quo-

Table 2

Average tariff equivalents for selected fruit and vegetables, 1986–88 (ECU per 100 kg)

Product	Internal price (1)	Border price (2)	Tariff equivalent (3)	Tariff equivalent as a percentage of border price (4)
Apples	62.7	33.0	29.7	90.0
Pears	56.9	27.3	29.6	104.4
Apricots	112.8	84.3	28.5	33.8
Cherries	156.2	122.0	34.2	28.0
Peaches	91.6	75.3	16.3	21.6
Table grapes	57.0	45.0	12.0	26.7
Plums	72.2	59.3	12.9	21.8
Lemons	62.2	30.3	31.9	105.3
Oranges	37.2	28.3	8.9	31.4
Small citrus fruit	67.5	64.3	3.2	5.0
Cucumbers	135.1	72.7	62.4	85.8
Zucchini	73.0	54.0	19.0	35.2
Artichokes	100.0	71.3	28.7	40.2
Tomatoes	223.6	82.8	140.8	170.0

Source: *Agra-Europe*, November 9, 1990.

(1) Reference prices set by the EC according to the Common Organization of the Market for fruits and vegetables. In the EC proposal to the GATT, these are called 'entry prices'.

(2) In the EC proposal to the GATT, these appear as 'reference prices', which is the term used by GATT for border prices.

tas have been applied to a number of processed fruits and vegetables. Phytosanitary restrictions are also in effect in the different EC members, which differ by country of origin, commodity, and season.

Quality differences between domestic and imported horticultural products render the estimation of nominal protection rates problematical. Table 2 shows the tariff equivalents for 1986–88 as calculated by the Commission in its proposal submitted to the GATT in November 1990. They represent the protective effect of all border measures combined, and range from 5% of the border price for small citrus fruit to 170% for tomatoes.

## 2.2. Trade preferences

Some geo-strategic country groups such as the Mediterranean Basin, SGP (Spain, Greece and Portugal) and ACP countries receive trade pref-

erences from EC in the form of tariff cuts with or without quantity restrictions, which vary in the extent of tariff reduction and product coverage. A typical structure of trade preferences is illustrated in Table 3 for oranges.

Since the early 1970s, changes in the structure of trade preferences have responded to pressures from preference recipients that feared the negative trade effects from the successive EC enlargements, the first of which largely restricted Mediterranean countries' access to EC markets (Pomfret, 1986). By 1978, several agreements had been concluded with Israel, the three Magreb countries (Tunisia, Algeria and Morocco), Egypt and Jordan, all of them major exporters of fruits and vegetables. Earlier agreements which led to the application of zero tariffs had been signed with Greece and Turkey, and in 1980 the EC signed a trade agreement with Yugoslavia.

The southern enlargement of the Community redefined its trade relation with the Mediterranean countries. The new member states – Spain, Greece and Portugal – exported together more than 25% of EC imports of fruits and vegetables from non-member states. Political

pressure from the French and Italian growers along with those of the Mediterranean non-member exporters led to the hardening of the conditions for accession to the Common Market and the revision of the Mediterranean agreements (Swinbank and Ritson, 1991).

Some steps were also taken for a further dismantling of customs duties for ACP exports to EC markets. After Lomé II and III (1981 and 1985, respectively), duty concessions were given for fruits and vegetables, ranging from complete exemption (grapefruit, papaya) to concessions on off-season exports (tomatoes, carrot, onions and asparagus). However, the trade concessions neither affected the reference prices nor were substantial for the periods when ACP exports are competing with EC internal production.

Utilization of EC's Generalized System of Preference (GSP) for developing countries had been significant only for a few regions, namely, Central America and the Southern Cone for fresh vegetables and processed products, and Southeast and South Asia especially for fresh fruits (Table 4). The low utilization of the Mediterranean and ACP regions can be explained by the

Table 3  
Rates of duty applied by the EC in orange imports from selected countries, 1991 (percent)

Fresh oranges	Orange juice <sup>a</sup>			
	16 October to 31 March	16 May to 15 October	Low density	High density
Spain <sup>c</sup>	2.4	0	4.7	10.5
Portugal <sup>c</sup>	6.6	0	2.6	5.9
Israel <sup>b</sup>	6.6–8	0–1.6	4.7–5.7	10.5–12.6
Cyprus	5.1	1	3.6	8
Lomé	4	0.8	0	0
Morocco <sup>b</sup>	4	0–0.8	4.7–5.7	10.5–12.6
Tunisia <sup>b</sup>	4	0–0.8	5.7	12.6
Algeria	4	0	4.7	10.5
Turkey	0	0	0	0
Non-preferred suppliers	20	4	19	42
GSP-Least developed countries	n.a.	n.a.	0	0

Source: European Commission, *Tariff Nomenclature*, April 1, 1991.

<sup>a</sup> An extra import levy can be applied for juice with a high sugar content.

<sup>b</sup> When two figures are presented, the lower one applies within a tariff quota.

<sup>c</sup> Although Spain and Portugal joined the EC in 1986, import duties have been applied against both countries' horticultural exports to the rest of the EC until 1992.

n.a., non-applicable: the full rate is applied.

Table 4  
Share of imports benefitting from the GSP in total EC imports by country group, 1987 (percent)

Region	Fresh fruits	Fresh vegetables	Processed products	Total
Magreb	0.1	0.0	0.0	0.0
Other Mediterranean countries	0.4	1.9	0.7	0.7
ACP Africa	0.7	0.0	0.3	0.5
ACP Caribbean	0.0	0.0	0.3	0.0
Central America	1.7	30.9	41.6	3.1
South America	5.0	8.4	5.9	5.5
Southern Cone	1.7	30.9	29.2	6.6
South East Asia	52.4	13.5	6.4	13.7
South Asia	50.5	24.2	28.9	48.4

Source: European Commission, *External trade: System of generalized tariff preferences*, 1987.

higher concessions granted in their separate trade agreements with the EC. It would appear that non-EC associates generally have been able to export their products to the EC without using the GSP scheme.

### 3. Analytical framework and data

In fact, EC policy is more trade preferential to some regions (or countries) than others. One way of isolating the influence of EC preferences from other factors that determine the international competitiveness of a region is to compare the export performance of that region with the contemporaneous export performance of the total of non-EC countries. The export performance of a given region in the EC market over a particular period can be attributed to: (a) factors affecting its relative competitiveness vis-à-vis the rest of non-EC countries; or (b) the relative growth of EC import demand; or (c) the preference margin enjoyed by the region's exports to the EC market.

Young (1972) and Yannopoulos (1986), among others, suggest using a double standardization technique to isolate the impact of factors (a) and (b) above. The impact of (c) would then be reflected in the size of the residual. The method is originally based on comparisons of rates of change of trade flows but it can easily be adapted to fit the decomposition framework developed below.

The first step in this double standardization procedure is to isolate the impact of EC import growth by taking the share of each region's exports in the total EC imports from non-EC countries. This share, of course, cannot by itself indicate the impact of competitiveness of the region vis-à-vis other non-EC exporters. It is then necessary to remove the effect of the latter.

The EC preference index for region  $i$  in product  $k$  can be defined as the ratio of the share of region  $i$  in extra-EC imports to the share of the same region in total non-EC exports to the world:

$$P_{ik} = \frac{m_{ik}}{s_{ik}} \quad (1)$$

where  $P_{ik}$  is EC import preference index for region  $i$  in product  $k$ ,  $m_{ik}$  share of  $i$  in EC imports of  $k$  from non-EC sources, and  $s_{ik}$  share of  $i$  in total non-EC exports of  $k$ .

This preference measure indicates the relative ability of any particular region to export to the EC against a 'control group' consisting of all non-EC members. If both shares are equal (ratio equal to one), then differences in export growth performance can be fully accounted for by the strength of EC import demand and changes in the relative competitive ability of region  $i$ . Any excess of the first share over the second indicates the presence of additional influences on trade performance. Such an additional influence comes from trade preferences. The preference index can be expected, other things the same, to have higher values for the regions in which member-countries have preferential trade arrangements with the EC.

Strictly speaking, the disparity between shares  $m_{ik}$  and  $s_{ik}$  cannot be attributed solely to trade preferences. Other determining factors include geographical proximity and historical linkages of the region and EC countries, as well as conditions in competing non-EC import markets. Another group of natural impediments to trade, which affect the trade preference index, relates to the 'socio-economic' distance between the exporting and the importing countries. Languages spoken, culture, business practices, institutions and law can create a favorable or unfavorable trade environment. Immigration and the increased fre-

quency of travel to regions outside the EC countries have made it easier for Europeans to be introduced to new varieties of fruit and vegetables and to establish new trade links to overseas regions. Regions with comparative advantage in the production of exotic products like tropical fruits (mango, lichi, papaya) are benefitted by a 'natural' preference in two ways: first, the search for cultural innovation and social symbolism in Western Europe favors growth of consumption of exotic products (Ilmonen, 1990); and second, exotic products' exporters are less affected by man-made barriers than exporting regions of products competitive to EC domestic fruit and vegetables, giving advantage to regions with agro-climatic conditions different from those existing in Europe. Marketing organization provides another explanation for varying degrees of trade preference when commercial linkages between exporters and importers have traditionally prevailed. These commercial linkages very often take the form of contractual arrangements between exporting firms and importers, which are usually distribution chains. Active participation of European trading companies in the marketing of horticultural exports from some regions has depended not only on the existence of tariff preferences but also on links related to historical accident and political relations. This is exemplified by the strong commercial relations between EC countries like France and UK and their traditional partners in the Mediterranean Basin and Africa.

The above considerations suggest that changes in the preference index over a given period should be interpreted as referring to the accessibility of EC market in the face of both natural and artificial impediments. In attributing changes in the preference index to the evolving pattern of trade agreements of the EC with developing countries, it is necessary to assume that no changes in those other factors have taken place.

The preference measure given in Eq. (1) can also be expressed as:

$$P_{ik} = \frac{M_{ik}}{M_{ik}^*} \quad (2)$$

where  $M_{ik}$  is actual EC imports of  $k$  from  $i$  and  $M_{ik}^*$  is the benchmark or 'expected' trade flow in product  $k$  from region  $i$  to the EC market.

Assuming that the benchmark is represented by the share of  $i$  in total non-EC exports of  $k$ , then:

$$M_{ik}^* = s_{ik} M_{ek} \quad (3)$$

where  $M_{ek}$  is total EC imports of  $k$  from non-EC suppliers. It follows from (2) and (3) that:

$$M_{ik} = P_{ik} S_{ik} M_{ek} \quad (4)$$

EC imports from non-EC countries can be represented in turn by:

$$M_{ek} = m_{ek} M_k \quad (5)$$

where  $M_k$  is total EC imports of  $k$  and  $m_{ek}$  is share of non-EC countries in total EC imports of  $k$ .

Therefore,

$$M_{ik} = P_{ik} S_{ik} m_{ek} M_k \quad (6)$$

Eq. (6) identifies four sources of growth (or decline) in EC imports of product  $k$  from region  $i$  over a given period:

- (1) *regional preference* effect, arising from a change in EC trade preferences to region  $i$  affecting product  $k$  (i.e.,  $\Delta P_{ik}$ );
- (2) *regional export share* effect, arising from a change in the share of  $i$  in total non-EC exports of  $k$  (i.e.,  $\Delta s_{ik}$ );
- (3) *non-EC preference* effect, arising from a change in the share of non-EC suppliers as a group in total EC imports of  $k$  (i.e.,  $\Delta m_{ek}$ );
- (4) *import growth* effect, arising from a change in total EC imports of  $k$  (i.e.,  $\Delta M_k$ ).

Each of these four effects can be isolated by holding constant the other terms in the right-hand side of Eq. (6). Historical data reflect, however, concurrent changes in  $P_{ik}$ ,  $S_{ik}$ ,  $m_{ek}$  and  $M_k$ . Hence, there is a fifth source of EC import growth, representing the *interaction* effect.

The regional export share effect arises from supply-side factors determining the relative competitiveness among non-EC exporting regions, which are related to domestic changes in relative prices and production costs. The extent to which regional export shares respond to changes in rela-

tive prices and costs is determined in part by the elasticity of substitution. Because there is significant product differentiation in fruits and vegetables, the elasticity of substitution is likely to be low (Sarris, 1984), which means that international competitiveness may not be strongly linked to relative prices. International competitiveness is also influenced by the availability of an efficient marketing system, including harvest and post-harvest technologies, refrigerated facilities, and transport to the main markets in the Northern Hemisphere. Non-price factors are of increasing importance in the marketing of fruit and vegetables, especially with respect to product quality, ability to adapt to the grades and standards of developed countries, promptness in delivery, and terms of credits. Moreover, growth of domestic output over a given period can affect the region's capacity to export, in terms of improved availability and price of exports. Domestic trade policies also influence the regional export share effects; reducing the bias against exports through trade policy reform, for example, would tend to increase the market share in traditional markets and to support diversification into new products.

The import growth effect and the non-EC preference effect are demand factors, the latter reflecting the impact of EC trade policies on non-EC suppliers. Total consumption of fruit and vegetables in Western Europe is mostly influenced by economic growth, cultural factors, and nutritional knowledge. The aging European population has shown increased consciousness of the health and nutritional values associated with fruits and vegetables. Among the factors affecting the import growth effect are the shift in EC's production structure towards or away from fresh and/or processed horticultural products and changes in relative demands for those products.

Revealed EC preference for horticultural products supplied by non-EC countries depends on the accessibility of these products to the EC market. Accessibility of extra-EC imports of fruits and vegetables is affected by: (a) self-sufficiency rates of domestic horticultural products; (b) interest in tropical and off-season fresh fruits and vegetables; and (c) ability of the marketing system to make product deliveries at required schedules

and given quality standards. Market access of foreign horticultural products to the EC has been reduced in two ways. First, domestic production has been encouraged by the shortening of off-season periods through the use of green-house facilities and development of early yielding varieties. And second, expansion of the EC market and proximity among member-countries have enhanced the development of economies of scale in the horticultural industry of some EC members like Holland and Belgium, reducing transaction costs in the whole chain of activities from production to distribution. In dealing with large shipments, overhead costs of labelling and packing, for example, are spread widely, lowering unit costs significantly.

The decomposition of EC horticultural import growth from developing countries can be shown formally as follows. The change in EC imports of product *k* from region *i* over the period from year 0 to year *n* is given by:

$$\Delta M_{ik} = P_{ik}^n S_{ik}^n m_{ek}^n M_k^n - P_{ik}^0 S_{ik}^0 m_{ek}^0 M_k^0 \quad (7)$$

from which the following 'components' or sources of growth can be derived:

$$\begin{aligned} \Delta M_{ik} = & s_{ik}^0 m_{ek}^0 M_k^0 \Delta P_{ik} && \text{(regional preference effect)} \\ & + P_{ik}^0 m_{ek}^0 M_k^0 \Delta s_{ik} && \text{(regional export share effect)} \\ & + P_{ik}^0 s_{ik}^0 M_k^0 \Delta m_{ek} && \text{(non-EC preference effect)} \\ & + P_{ik}^0 s_{ik}^0 m_{ek}^0 \Delta M_k && \text{(import growth effect)} \\ & + \text{residual terms} && \text{(interaction effect)} \end{aligned}$$

where the residual terms consist of:

$$\begin{aligned} & m_{ek}^0 M_k^0 \Delta P_{ik} \Delta s_{ik} + s_{ik}^0 M_k^0 \Delta P_{ik} \Delta M_{ek} \\ & + s_{ik}^0 m_{ek}^0 \Delta P_{ik} \Delta M_k + P_{ik}^0 M_k^0 \Delta s_{ik} \Delta m_{ek} \\ & + P_{ik}^0 m_{ek}^0 \Delta s_{ik} \Delta M_k + P_{ik}^0 s_{ik}^0 \Delta m_{ek} \Delta M_k \\ & + s_{ik}^0 \Delta P_{ik} \Delta m_{ek} \Delta M_k + m_{ek}^0 \Delta P_{ik} \Delta s_{ik} \Delta M_k \\ & + M_k^0 \Delta s_{ik} \Delta m_{ek} + \Delta P_{ik} \Delta s_{ik} \Delta m_{ek} \Delta M_k \end{aligned}$$

Aggregation of each of the five effects across regions gives the corresponding effects for all LDCs as a group.

Table 5

Decomposition of the sources of EC horticultural import growth from developing countries, 1975–1979 to 1985–89 (million 1985 Ecu)

	Regional preference	Regional export share	Non-EC preference	Import growth	Interaction	Total
<b>Total fruits and vegetables</b>						
Magreb	55.2	-253.9	-60.5	82.9	-23.8	-200.1
Other Mediterranean	-42.3	22.2	-75.5	146.5	-41.6	9.3
ACP Africa	15.9	-89.4	-21.1	48.1	-14.1	-60.6
Caribbean Region	4.4	-72.3	-4.8	28.0	-11.9	-56.6
Central America	6.2	45.6	-3.6	29.9	2.1	80.2
Andean-Brazil	25.8	286.0	-21.2	54.1	49.6	394.3
Southern Cone	-1.8	71.1	-16.6	28.5	16.4	97.6
Southeast Asia	-76.9	37.3	-54.1	89.3	-14.5	-18.9
South Asia	49.3	-16.1	-2.6	10.6	-4.7	36.5
<b>Total</b>	<b>35.8</b>	<b>30.5</b>	<b>-260.0</b>	<b>517.9</b>	<b>-42.5</b>	<b>281.7</b>
<b>Fresh fruits</b>						
Magreb	40.6	-87.5	-0.2	17.7	-16.2	-45.6
Other Mediterranean	36.4	-203.4	-0.6	59.5	-18.7	-126.8
ACP Africa	-1.6	-35.8	-0.2	17.4	-2.1	-22.3
Caribbean Region	22.7	-75.8	-0.2	21.9	-8.6	-40.0
Central America	2.9	48.3	-0.3	25.7	3.6	80.2
Andean - Brazil	-21.7	69.5	-0.2	19.2	-2.3	64.5
Southern Cone	14.0	92.6	-0.1	12.4	13.5	132.4
Southeast Asia	0.9	3.4	-0.0	3.2	0.4	7.9
South Asia	46.2	-14.3	-0.1	7.8	-3.5	36.1
<b>Total</b>	<b>140.4</b>	<b>-203.0</b>	<b>-1.9</b>	<b>184.8</b>	<b>-33.9</b>	<b>86.4</b>
<b>Fresh vegetables</b>						
Magreb	-8.4	-132.4	-44.1	38.1	3.6	-143.2
Other Mediterranean	-89.4	93.4	-47.4	41.0	-32.6	-35.0
ACP Africa	16.6	-9.5	-5.2	4.5	-5.5	0.9
Caribbean Region	-6.8	-0.4	-2.0	1.7	0.2	-7.3
Central America	-0.2	-0.1	-1.7	1.5	-0.3	-0.8
Andean - Brazil	13.9	-1.7	-0.4	0.4	-9.1	3.1
Southern Cone	-18.2	-19.9	-14.1	12.2	3.5	-36.5
Southeast Asia	48.8	10.8	-5.5	4.8	10.8	69.7
South Asia	-2.8	-0.5	-1.6	1.4	0.1	-3.4
<b>Total</b>	<b>-465</b>	<b>-60.3</b>	<b>-122.0</b>	<b>105.6</b>	<b>-29.3</b>	<b>-152.5</b>
<b>Processed products</b>						
Magreb	23.0	-34.0	-16.2	27.1	-11.2	-11.3
Other Mediterranean	10.7	132.2	-27.5	46.0	9.7	171.1
ACP Africa	0.9	-44.1	-15.7	26.2	-6.5	-39.2
Caribbean Region	-11.5	3.9	-2.6	4.4	-3.5	-9.3
Central America	3.5	-2.6	-1.6	2.7	-1.2	0.8
Andean - Brazil	33.6	218.2	-20.6	34.5	61.0	326.7
Southern Cone	2.4	-1.6	-2.4	3.9	-0.6	1.7
Southeast Asia	-126.6	23.1	-48.6	81.3	-25.7	-96.5
South Asia	5.9	-1.3	-0.9	1.4	-1.3	3.8
<b>Total</b>	<b>-58.1</b>	<b>293.8</b>	<b>-136.1</b>	<b>227.5</b>	<b>20.7</b>	<b>347.8</b>

Source: Authors' calculations.

Trade flows of horticultural products from developing countries to the European Community are analyzed in this paper using the above decomposition framework. It gives a statistical rather than causal explanation of EC import growth of fruits and vegetables. One of the limitations of such framework is the lack of statistical significance tests to identify and validate the factors underlying the demand and the supply effects. Work involving econometric modelling of the relevant trade flows would be complementary. One such approach is based on the traditional price model that estimates the elasticity of substitution between horticultural products imported from different sources (Sarris, 1984; Honma, 1991). While these models provide an *ex ante* explanation of the sources of import growth and are suitable for simulation analysis, they also abstract from a host of non-economic variables explaining trade flows in the international market for fruits and vegetables. Non-price competition implies that a model based on price differentials does not give much useful information. On the other hand, man-made barriers are very difficult to test separately from other factors affecting price differentials.

An alternative framework that captures the effect of trade preferences is the gravity-type model of trade flows (Sapir and Lundberg, 1984; Truett and Truett, 1991), which uses dummy variables to isolate the impact of preferences on export performance. Other explanatory variables

often used in gravity models of international trade are measures of export supply capacity, such as GNP or population in the exporting countries, and the physical distance between trading partners to reflect transport costs. While this approach gives an appealing means of testing for the effects of trade preferences, it has also some drawbacks. The proxy variables used for export supply capacity are clearly inadequate, and the effects of institutional and political factors are not well represented.

The main data sources for the decomposition analysis of horticultural trade flows done in this study are the FAO Trade Data Tape for regional data on exports, and EUROSTAT's Analytical Tables on External Trade for EC import data on fresh fruits, fresh vegetables and processed products by geographic source. The 135 horticultural products from the FAO data tape are aggregated into the three commodity groups as defined in the Combined Nomenclature for the EUROSTAT data. Tropical and non-tropical fresh fruits are considered under the same heading 'fresh fruits' (chapter 8 of the Combined Nomenclature) because, in the context of the present study, both types of fruits are substitute goods from the point of view of consumers in Western Europe. Tropical roots (cassava and manioc) are excluded from the study because their exports are mostly devoted to the animal feeding industry.

Annual values for each horticultural product group during 1975–79 and 1985–89 are deflated

Table 6  
Sources of EC horticultural import growth from developing countries, 1975–1979 to 1985–1989 (percent of initial imports)

	Regional preference	Regional export share	Non-EC preference	Import growth	Interaction	Total
TOTAL FRUITS AND VEGETABLES						
Magreb	8.01	-36.83	-8.78	12.03	-3.45	-29.03
Other Mediterranean	-2.88	1.51	-5.14	9.98	-2.83	0.63
ACP Africa	3.70	-20.81	-4.91	11.19	-3.28	-14.10
Caribbean region	1.14	-18.76	-1.25	7.27	-3.09	-14.69
Central America	1.42	10.44	-0.82	6.85	0.48	18.37
Andean-Brazil	5.56	61.61	-4.57	11.65	10.69	84.94
Southern Cone	-0.58	23.05	-5.38	9.24	5.32	31.64
Southeast Asia	-17.12	8.30	-12.05	19.88	-3.23	-4.21
South Asia	34.90	-11.40	-1.84	7.50	-3.33	25.84
Total	0.75	0.64	-5.45	10.85	-0.89	5.91

Source: Authors' calculations.

by the price index of EC total imports, and then averaged over each of the two (beginning and ending) five-year periods. Developing countries are grouped into nine regions (see Annex I) based not only on geographical proximity but also on their political relation with the EC. Thus, four of the regions considered, namely Magreb, Other Mediterranean countries, ACP Africa and ACP Caribbean Region, have a special association and trade agreements with the EC. Developed countries are included in two groups: SGP (Spain, Greece and Portugal) and the residual category, 'Other non-EC countries'.

#### 4. Empirical results

The results of the decomposition of EC growth in horticultural imports from 1975–79 to 1985–89 are summarized in Tables 5 and 6 for various LDC regions (the latter table showing the changes in percentage terms for all horticultural products combined), and in Table 7 for comparisons among LDCs as a group and two other non-EC regions. It is necessary to point out, first of all, that while total LDC horticultural exports to the EC market increased significantly during the period (see last column of Table 5), this was largely due to the

Table 7

Sources of EC horticultural import growth and other non-EC country groups, from developing countries, 1975–1979 to 1985–1989

	Regional preference	Regional export share	Non-EC preference	Import growth	Interaction	Total
ABSOLUTE CHANGES (million 1985 ECU)						
Total fruits and vegetables						
Developing countries	35.80	30.50	-260.00	517.90	-42.43	281.77
Spain, Portugal, Greece	231.13	83.61	-151.64	283.68	30.14	476.92
Other non-EC countries	-240.46	-247.07	-219.79	329.79	21.12	-356.89
Fresh fruits						
Developing countries	140.40	-203.00	-1.90	184.80	-33.90	86.40
Spain, Portugal, Greece	79.12	-18.72	-1.07	97.83	12.59	169.75
Other non-EC countries	-19.25	29.26	-0.93	85.03	11.99	106.10
Fresh vegetables						
Developing countries	-46.50	-60.30	-122.00	105.60	-29.30	-152.50
Spain, Portugal, Greece	159.35	122.04	-68.25	59.05	23.52	295.71
Other non-EC countries	-89.84	-124.05	-137.50	118.97	0.83	-231.60
Processed products						
Developing countries	-58.10	293.80	-136.10	227.50	20.70	347.80
Spain, Portugal, Greece	-7.34	-19.71	-82.33	126.79	-5.96	11.46
Other non-EC countries	-131.37	-152.20	-81.37	125.32	8.31	-231.39
RELATIVE CHANGES (percent of initial imports)						
Total fruits and vegetables						
Developing countries	0.75	0.64	-5.45	10.85	-0.89	5.91
Spain, Portugal, Greece	7.60	2.75	-4.99	9.33	0.99	15.68
Other non-EC countries	-9.79	-10.06	-8.95	13.40	0.86	-14.53
Fresh fruits						
Developing countries	4.73	-6.84	-0.06	6.23	2.91	2.91
Spain, Portugal, Greece	4.57	-1.08	-0.06	5.65	0.73	9.81
Other non-EC countries	-1.31	2.00	-0.06	5.81	0.82	7.25
Fresh vegetables						
Developing countries	-5.89	-7.64	-15.45	13.38	-3.71	-19.32
Spain, Portugal, Greece	21.58	16.53	-9.24	8.00	3.19	40.05
Other non-EC countries	-13.49	-18.62	-20.64	17.86	0.12	-34.77
Processed products						
Developing countries	-5.73	28.97	-13.42	22.44	2.04	34.30
Spain, Portugal, Greece	-1.28	-3.44	-14.39	22.17	-1.04	2.00
Other non-EC countries	-40.21	-46.61	-24.90	38.36	2.54	-70.82

Source: Authors' calculations.

considerable growth in processed product exports. EC imports of fresh fruits from developing countries also grew, albeit much less significantly, but fresh vegetable imports declined sharply.

The main contribution to EC import growth in fruit and vegetables is seen to be the import growth effect. However, it has been significantly counteracted by the negative effect of a declining share of non-EC suppliers as a group. This would seem to indicate that in general EC border measures have adversely affected the growth of LDC horticultural exports. Disaggregation into the three product categories reveals that the negative non-EC preference effect was significant for fresh vegetables and (even more so) processed products but not for fresh fruits, the latter suggesting that non-EC exporters have been competitive with fresh fruit producers from within EC; moreover, the lack of domestic 'off season' production gives additional scope for fresh fruit imports to enter the EC market. That exports of processed products have been the most severely affected is not surprising, given their higher import duties relative to fresh fruits and vegetables and the growing subsidies to processed products.

Overall, LDC suppliers are seen to have suffered a significant reduction in fresh fruit and vegetable exports due to declining regional export shares; however, they benefitted from significant gains in the processed products category. A marked difference can also be discerned in the regional preference effect between fresh fruits on the one hand and fresh vegetables and processed products on the other. In the former case, the magnitude of the positive effect was about three-quarters of that due to total import growth; on the other hand, the combined loss in LDC exports of fresh vegetables and processed products to the EC due to the regional preference effect reduced by one-third the total gain from the import growth effect.

Among the LDC regions distinguished in Tables 5 and 6, Andean–Brazil, the Southern Cone, and Central America show the largest increases in total horticultural exports to the EC market. In each of these regions, the regional export share effect (i.e., due to increasing export shares) was the principal source of export growth, exceeding

the magnitude of the import growth effect. This indicates the relative significance of domestic supply factors, especially since the regional preference effect is seen to be either negative (for the Southern Cone) or comparatively small (for Central America and Andean–Brazil).

These same regions show up as the fastest-growing fresh fruit exporters; again, the regional export share effect was the dominant contributor to export growth. In the case of fresh vegetables in which developing countries as a group had negative export growth, the most dynamic exporting region was Southeast Asia, where both the regional export share effect, and more importantly, the regional preference effect outweighed the expansion of exports due to EC's total import growth.

It is also worth noting that in the preferred suppliers, namely, the Magreb and Other Mediterranean regions and ACP countries, the negative or very small value of the regional export share effect largely explains their slow growing export performance for total fruits and vegetables (Table 6). If EC imports had been constant, EC imports from ACP countries would have fallen about 20% and from Magreb about 36% during the study period.

The most dramatic increase in LDC horticultural exports to the EC was in processed products. Andean–Brazil and other Mediterranean countries were the only significant contributors. In both regions, the regional export share effect was the most dominant, accounting for more than two-thirds of total export expansion.

Marked interregional differences in the magnitude of the regional preference effect are seen in Tables 5 and 6. Horticultural export growth in the Magreb countries appears to have benefitted from earlier trade agreements with the EC, except in fresh vegetables. With ACP Africa it is only in the fresh vegetables category that the preferential trade arrangements seem to have yielded substantial export expansion. Other Mediterranean countries show a significantly positive regional preference effect on exports of fresh fruits but a significantly negative effect on exports of fresh vegetables. These results are not surprising, considering that product differentiation and

non-price competition, which are prevalent in horticultural trade, tend to weaken the discriminatory effect of preferential tariffs and quantity restrictions.

On the other hand, some of the 'non-preferred' regions were able to raise their EC preference index, expanding their horticultural exports to the EC market by more than the 'expected' flows. For total fruits and vegetables these export gains were in South Asia and Andean–Brazil than in the 'preferred' regions (except Magreb). This is also true for fresh fruits in South Asia, for fresh vegetables in Southeast Asia, and for processed products in Andean–Brazil.

Concerning non-LDC countries, SGP shows a marked positive regional preference effect, accounting for about 50% of total export growth of fresh products from this region to the EC (Table 7). This would be partly attributable to the trade creating and diverting effects of the integration of these southern European countries to the EC although, as discussed below, there would be other additional factors that explain SGP regional trade gains during the period.

Other developed countries are included in the 'Other non-EC countries' region which, apart from the positive import growth effect, only shows a positive export share effect in fresh fruits while, in the other two product groups, the loss of competitiveness account for more than the 50% of the observed negative export growth (Table 7). The regional preference effect is negative for each of the three product groups, indicating a large reduction of market access for developed countries in the EC importing market. Note that, since all non-EC countries are considered in Table 7, the sum of the non-EC preference effect for the three regions gives a picture of the trade diverting effects of EC protection against third countries during the period.

## 5. Discussion and policy implications

### 5.1. Role of trade preferences

There are some specific reasons for the observed lack of a strong correlation between the

existence of preferential trade agreements with the EC and the magnitude of the regional preference effect. First, as noted above, the net border protection against third countries is typically lower for products in which EC imports do not compete directly with domestic production. In the case of fresh fruits, for example, the lack of domestic 'off-season' production induces more LDC exports, whether from preferred or non-preferred regions, to enter the EC market. Due to similarity in agro-climatic conditions, non-EC exporters from the Mediterranean countries supply some horticultural products covered by the CAP which are competitive with the domestic production of the southern members of the EC. Therefore, Mediterranean exporters have been more likely to face non-tariff measures (the reference price system, import licenses) than imports from 'exotic' regions of the Southern Hemisphere and tropical producers. Second, non-price competition is encouraged by the reference price system for a number of fruits and vegetables covered by the CAP (Ritson and Swinbank, 1984). On the one hand, this minimum-price system is one of the factors that has influenced the creation of marketing boards in some exporting countries which, by monitoring the quality and frequency of supplies, have reduced the risk of countervailing duties. On the other hand, countervailing duties are calculated for each supplier to cover the difference between offer and minimum prices. Therefore, the system does not favor low-cost supplies and takes competition to another field. Third, as pointed out earlier, the preference measure used is affected by exogenous developments in non-EC markets. Thus, the dramatic expansion of Japanese horticultural imports in the 1980s (Honma, 1991) would have drawn away from Southeast Asian exports to the EC market – which is consistent with this region's share decline in total fruit and vegetable exports to the EC attributable to the regional preference effect. Also, the very large positive regional preference effect on Caribbean exports of fresh fruits and accompanying negative effect on fresh vegetables and processed products (which are more highly protected in the EC) were likely influenced by the trade preferences granted by the United

States under the Caribbean Basin Initiative. Lastly, trade preferences create favorable export conditions for products in which the beneficiaries have comparative advantage (Yannopoulos, 1986, p. 23). Developing countries with a relatively developed industrial infrastructure are likely to reallocate domestic resources that will lead to a shift in horticultural exports toward processed products. This can partly explain why the Mediterranean countries had a much stronger regional preference effect in processed horticultural exports than ACP Africa.

From Table 7 the sign of the regional export share effect for developing countries – negative for fresh products and positive for processed products – indicates that their comparative advantage tend to shift to the processing of horticultural products. The circumstances under which this process is taking place need further analysis. One source of insight is the product cycle trade theory (Vernon, 1979) which provides a dynamic explanation of changes in comparative advantage. When a horticultural product is first introduced, the innovative character of the product plays a major role in explaining trade flows. Only a few countries, not necessarily those most endowed with natural resources and labor, are able to export the quality products demanded by high-in-

come consumers in developed countries and to engage successfully in non-price competition. After a while, as the ‘technology’ for producing and marketing the product becomes more standardized and familiar, other less developed countries begin to acquire the technology and compete in the horticultural export market. Such product cycle can explain the contrast in the regional preference effects between the two groups of countries on opposite sides of the Mediterranean Basin. The requirements of marketing expertise and quality in the exporting of perishable products are higher than the standard processing of horticultural products. The required effort to penetrate export markets for fresh products has probably been mastered in the SGP region but not, as yet, in the Magreb and Other Mediterranean countries. Non-price competition is likely to characterize the market for fresh products, which weakens the effect of preferential tariffs.

Trade-diverting effects from the enlargement of the EC, now including the SGP region, partly explain the import share losses of Mediterranean countries in the EC market for fresh products (Table 8). However, the regional preference effect between 1975–79 and 1985–89 has been positive for the third Mediterranean countries in fresh fruits and processed horticultural products. Market losses in Mediterranean exports of fresh products to the EC existed even before the integration of Spain and Portugal into the EC (Table 8). At the same time, the regional preference effect of the SGP region was negative in processed products. Therefore, there is no clear evidence of a trade diversion bias against third Mediterranean countries, at least during the first period following the accession of Spain and Portugal to the EC.

Apart from the role of non-price factors mentioned above, policy developments in the 1980s may explain why changes in preferences have not been a determining factor in the evolution of market shares of the third Mediterranean countries. Greece already benefitted from zero tariffs before its integration into the EC in 1986. Spain and Portugal only received limited tariff concessions in the four years after 1986 because com-

Table 8  
Shares of Spain, other Mediterranean countries and EC members in total EC imports (percent)<sup>a</sup>

	1977/80	1982/85	1987/89
Fresh fruits			
Spain	14.0	14.9	16.9
Other Mediterranean	15.0	13.6	10.8
EC	31.2	30.8	30.5
Fresh vegetables			
Spain	7.8	9.2	12.0
Other Mediterranean	10.8	8.0	6.9
EC	60.6	65.6	65.0
Processed products			
Spain	6.9	5.2	5.3
Other Mediterranean	8.1	9.3	9.5
EC	49.5	52.4	56.1

Source: EUROSTAT's Analytical Tables on External Trade.  
<sup>a</sup> The EC imports are referred to the total (intra+extra trade) of the former nine EC members.

plete free trade for both countries' exports to the EC were phased over a longer period until 1996, although by the beginning of 1993 the integration has been accelerated considerably. Following the accession of Spain and Portugal in 1986, the EC concluded Additional Protocols to the existing agreements with Mediterranean states, in order to prevent the erosion of their traditional trade with the EC. Through the provisions of the Additional Protocols, the concessions to the Mediterranean Associates countries mirrored the tariff reductions for Spain and Portugal. New tariff concessions were granted over the same period for Spain and Portugal. These would have reduced the trade diversion bias against Mediterranean states.

In fact, since the late seventies, there is no evidence that relative preference margins among the different EC suppliers changed significantly enough to cause major changes in trade patterns, at least among the traditional beneficiaries of EC trade concessions. Apart from the Additional Protocols and the EC enlargement mentioned above, ACP countries were benefitted by a package of duty reductions within the framework of Lomé IV for a wide range of fruits and vegetables but very often limited by tariff quota, reference quantities, and seasons.

In assessing the impact of tariff preferences on trade, we cannot exclude the possibility that in fruits and vegetables, the initial tariff margin allowed preferential exporters to build up a market share in the EC and to capture economic rent at the expense of non-preferred suppliers and European consumers. Very often, new crops that are not consumed or produced in developing countries were introduced by foreign companies to meet an expanding foreign demand. Where the preference margin is high enough, EC imports are dominated by the preferred countries. This is shown by the size of the preference index for Magreb, Other Mediterranean, SGP and ACP regions which are generally higher than one. But the extent to which the preference is an important catalyst of the growth of market share is not clear. Other factors are likely to be more important for developing a dynamic horticultural export sector. These include the adequacy of infras-

structure facilities, the availability of entrepreneurial skills, the sufficiency of investment funds, and the appropriateness of the policy framework. Considering that most of the EC associates have had their preferences for well over 15 years, it is also unlikely that there are remaining dynamic effects in the pipeline.

## 5.2. *Agricultural trade liberalization*

The size of the negative non-EC preference effect gives support to trade liberalization in horticultural products and new GATT rules in the context of the current Uruguay Round of multilateral negotiations. At the GATT ministerial meeting held in Montreal in December 1988, an interim agreement was reached in which the EC would grant tariff cuts for a variety of tropical fruits. However, banana exports, which constitute a significant share of export earnings for many LDCs, were an important exception in the EC proposals for agricultural trade liberalization. This was due to the special measures recently introduced by the EC to keep the market niche that ACP countries (together with EC suppliers like Canary Islands and Martinique) have enjoyed in some of the major European markets like the United Kingdom and France. The EC proposal would imply a tariff quota of about 2 million tons of 'dollar' banana, that is to say, bananas imported from non-EC associates, and the application of prohibitive tariffs for ex-quota quantities. Reduction of EC protection is also needed for temperate horticultural products falling under the CAP that will expand the scope for export diversification in some developing countries which are too specialized in tropical product exports. By November 1992, the United States government and the European Commission seemed to have reached a pre-agreement for a comprehensive tariffication that would include horticultural products covered by the CAP. This raises the question about the new form that the Common Organization of the Market for fruits and vegetables will take, after a future reform currently under study by the Commission. Concerning market access, a question remains on the import price stabilization scheme that would substitute

for the current reference price system which is not consistent with GATT rules.

Tariffication and the extension of multilateral tariff concessions will reduce the existing preference margins for the LDC regions that are beneficiaries of EC trade preferences. However, in tropical products, most of the concessions offered by EC refer to MFN tariffs and not to GSP rates, which are the significant ones not only for non-ACP developing countries but also for the ACP states, since it is the latter rates that determine their tariff preferences. Consequently, the EC offer on tropical products will erode ACP preferences to only a minor degree (Davenport and Stevens, 1990). Erosion in preferences will be greater if, in the framework of the GATT, there is a multilateral agreement on bananas and on horticultural temperate products. In the case of bananas, it is unlikely that ACP producers can compete without the guarantees they now enjoy in the EC market. Most of the protected producers are small-scale and relatively inefficient; given their topographical disadvantages, their costs are considerably higher than those of the large plantations of Central America, Colombia and Ecuador (Etienne, 1992). In the case of temperate fruits falling under the CAP, multilateral tariff concessions will affect Mediterranean suppliers if, for example, US citrus fruit exports gain access to European markets. However, a comprehensive multilateral tariffication will also benefit Mediterranean producers, given the dismantling of the existing quantitative restrictions and of the price reference system. Moreover, the EC could grant new concessions that allow preferential suppliers to improve their access to the EC market in a way that it is not matched by a general liberalization of the CAP. Furthermore, the EC could use Lomé Convention provisions and Mediterranean protocols to provide financial assistance in support of export diversification in these countries.

### 5.3. *Actions to ease supply-side constraints*

Based on the results presented above, increasing the regional export share is a major source of EC horticultural import growth from some LDC

regions. This implies that domestic supply factors are important and that the opening of the EC market is not a sufficient condition for LDC export growth. Many developing countries (e.g., Chile) which succeeded in increasing their high-value agricultural exports during the 1970s and 1980s had undertaken major macroeconomic policy reforms (Burfisher et al., 1991). These included the liberalization of trade policies and exchange rate devaluations that significantly reduced the implicit taxation of tradeable goods. Indeed, in many LDCs, the disincentives for agricultural export producers arising from distortionary trade and macroeconomic policies have been substantial (Bautista, 1990).

Some sector-specific measures could also be adopted to improve the international competitiveness of horticultural export producers in developing countries. First, the removal of production levies and export taxes on fruits and vegetables is warranted in countries where such direct price penalties still exist.

Second, the establishment of producer and export marketing associations could be encouraged to raise production efficiency in the horticultural sector and be responsive to the volume, quality, and regularity of shipments required by EC importers. The greater concentration of export supply would enable these associations to deal more effectively with the large companies that increasingly dominate the European distribution system (Hatrival, 1990). LDC producer and marketing associations could also cooperate with their EC counterparts in coordinating supplies from different sources, at different seasons, and for different grades of horticultural products.

Third, LDC governments should ensure that existing quality control systems are adequate in meeting the sanitary and phytosanitary standards of importing countries. The EC itself could provide technical and financial assistance in setting up testing laboratories and in training scientific personnel to enforce quality standards for horticultural exports.

Lastly, the increasing trend toward regionalism presents an opportunity for LDCs to explore possibilities for new export markets for fruits and vegetables in the context of regional market inte-

gration. Successful development of regional markets is likely to have dynamic, learning effects for horticultural export producers that can help their efforts to expand to the EC and other extra-regional markets.

## 6. Concluding remarks

While the sources-of-growth approach adopted in this study suffers from the usual limitations of any statistical decomposition analysis (Richardson, 1971; Konandreas and Hurtado, 1978), the results give indication of the relative influence of some factors that intuitively have a bearing on EC imports of fruits and vegetables from developing countries. They also indicate relevant areas that be analyzed in greater depth by more behaviorally based econometric studies.

Growth of total LDC horticultural exports to the EC market has been found to have depended heavily on the EC's total import growth. Since the latter is in turn dependent on income growth, future expansion of LDC exports of fruits and vegetables to the EC can be expected to be strongly linked to economic growth in the EC countries.

Another result to be emphasized is the countervailing effect of a diminishing market share of non-EC suppliers as a group. LDC prospects for a significant increase in horticultural exports to the EC would likely improve if EC border measures were liberalized, especially those affecting fresh vegetables and processed products. For too long EC agricultural protectionism has contributed heavily to inefficient allocation of the world's agricultural resources. The above findings suggest that horticultural producers in developing countries have been effectively penalized.

The observed large differences in export growth performance across LDC regional groups point to a significant role also played by domestic supply factors. Indeed, in each of the three horticultural product types, the positive effect of improving competitiveness for some regions has been found to outweigh other sources of export growth. This indicates a potentially substantial scope for promoting horticultural exports through

economic policy reform in many LDCs where agricultural exportables are taxed not only directly by product-specific policies but also, and often more significantly, by the indirect effect of economy-wide policies. Apart from the elimination of price-incentive biases, government policies can also promote horticultural export infrastructure facilities and support services, including the dissemination of information on foreign markets, credit assistance, and improvement of quality standards.

Supply-side considerations assume added significance given that the degree of regional trade preference accorded by the EC, as shown above, has not been a major influence on the regional pattern of EC horticultural import growth from developing countries. Indeed, world trade liberalization on a non-discriminatory basis in future might well confer benefits in terms of total exports that exceed those received by EC-preferred regions from preferential trade agreements on horticultural products, in which case the possible losses from the withdrawal (or ineffectiveness) of EC trade preferences would be more than compensated for.

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## Annex I: Definition of regions

*Magreb*: Morocco, Tunisia, Algeria.

*Other Mediterranean countries*: Turkey, Israel, Yugoslavia, Egypt, Cyprus, Jordania.

*ACP Africa*: Mozambique, Madagascar, Somalia, Kenya, Zimbabwe, Cameroon, Cote d'Ivoire, Swaziland.

*Caribbean region*: Guadeloupe, Martinique, Dominica, Grenada, Jamaica, Suriname, Belize.

*Central America*: Mexico, Guatemala, Honduras, Nicaragua, Panama, Costa Rica.

*Andean–Brazil*: Brazil, Colombia, Venezuela, Ecuador, Peru.

*Southern Cone*: Argentina, Uruguay, Chile.

*Southeast Asia*: Thailand, Philippines, Indonesia, Malaysia, Taiwan, China, Hong Kong.

*South Asia*: Iran, India, Sri Lanka.

*LDC*: All the regions mentioned above. It includes the LDC major exporters of horticultural products to the EC. This group only contains the developing countries that exported over a given value to EC in 1989. This value was 5 million ECU for fresh fruits and fresh vegetables, and 2.5 million ECU for processed horticultural products.

*SGP*: Spain, Greece, Portugal.

*EC*: First EC nine former members.

*Non-EC*: Countries that are not a part of EC-9.

*Other non-EC*: Non-EC countries other than LDC and SGP.

