# Liberalising EU Imports for Fruits and Vegetables

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# LIBERALISING EU IMPORTS FOR FRUITS AND VEGETABLES

*Abstract*
This paper quantifies the impact of abolishing EU import barriers with respect to fruits and vegetables for sixteen fruits and vegetables. The estimations made are based on HORTUS, a supply and demand model for fruits and vegetables developed at LEI. HORTUS models the production, consumption and bilateral trade in fruits and vegetables for all EU25-countries, Morocco, Turkey and the Rest of the World. The paper shows that trade liberalisation has a large impact on European fruit production and trade. EU fruit production and exports are likely to fall substantially. European vegetable production and exports are relatively sheltered and are likely to benefit from the decline in EU fruit production.

Keywords: trade liberalisation; economic integration, fruits and vegetables.
JEL-classification: F15, F17, Q17

## 1 Introduction

Horticulture is one of the most liberalised sectors within European agriculture. The Common Agricultural Policy for fruits and vegetables is primarily restricted to import regulation. Import restrictions are thought to be of little importance. However, this does not mean that import barriers for fruits and vegetables are absent and unimportant. For some products, there are possibly substantial trade barriers. This holds e.g. for bananas, citrus and tomatoes. These issues play a large role in trade negotiations between the EU and Mediterranean countries and in WTO negotiations.

This paper quantifies the impact of European trade liberalisation on European fruits and vegetables production and trade. The estimations are based on a partial equilibrium model relating European fruits and vegetables production, consumption and trade to – among other things - import barriers. This paper is constructed as follows. Section 2 presents some artefacts on European trade barriers for fruits and vegetables. Section 3 outlines the demand and supply relations employed. Section 4 outlines the data sources used. Section 5 presents the estimations made. Section 6 concludes.

## 2 European import restrictions for fruits and vegetables

Table 1 presents some key data on European fruits and vegetables supply. Two thirds of European fruits and vegetables consumption is produced domestically (excluding intra-European trade). So, one third of European fruits and vegetables consumption is supplied through imports. More than 60% of European imports is intra-European trade. About 10% of European imports originates from Mediterranean countries and about a quarter of European imports is from the Rest of the world. There is some trade protection in the EU with respect to non-European fruits and vegetables. The tariff-equivalent trade restrictions are roughly 5-6%. This means that all European trade barriers on fruits and vegetables raise import price 5-6% above world price levels.

Table 1. Key figures on fruits and vegetables trade.

| | Household purchases | Tariff-equivalent trade barriers |
|---|---|---|
| Domestic supply | 67% | |
| Import supply | 33% | |
| Intra-EU trade | 63% | 0% |
| Mediterranean countries | 10% | 5,1% |
| Other countries | 27% | 5,5% |

Source: GTAP.

Import barriers are specified for individual fruits and vegetables and individual countries of origin. The EU shelters European fruits and vegetables production using tariffs, quota's, tariff-quota's and entry price systems. The EU grants preferential trading arrangements to some countries, among which former colonies and neighbour countries. European banana imports are subject to tariff-quota's. Traditional ACP countries are exempt from these tariff quota's, but non-traditional ACP-countries and non-ACP countries pay tariffs up to 737 euro per ton for out-of-quota imports (Badinger et al., 2002). Other key fruits and vegetables are also subject to a system of entry prices. Tariffs on citrus, apples and tomatoes are related to daily adjusted entry prices (Cioffi and dell'Aquila, 2004). These tariffs amount to 3-16% for citrus; 8-15% for tomatoes; and 9-11% for apples. Trade concessions – lower tariffs for specified quota - are granted to South Africa, Morocco, Brazil and Israel for citrus; to the Czech Republic, South Africa, Brazil and Chile for apples; and to Morocco, Turkey and Israel for tomatoes.

The previous paragraph shows that import European import restrictions with respect to fruits and vegetables may be substantial. However, one should be careful, when assessing these data. Average tariff protection applies to both low-import and high-import seasons. Moreover, importers may prevent tariffs by storing products. In 2000 e.g., very little apple imports were subject to the daily adjusted tariffs. Moreover, these data do not take account of possible non-tariff barriers.

Ideally, we would like to have product and country specific tariff equivalents for our simulations in section 5. For the moment, we apply the general level based on the GTAP database. This has one advantage. The results may be used as a benchmark. The simulations in section 5 indicate what fruits and vegetables are most sensitive to general reductions in tariff equivalents.

## 3 Economic structure

This section outlines the economic structure in HORTUS as well as the demand and supply relations.

### *3.1 Economic structure*

HORTUS is based on a simple input-output structure constructed on basis of commodity balance information and additional cost information (see section 4). The output value of commodity j in region s at market prices is indicated by VOM(j,s). The output value equals the sum of all intermediary inputs used in industry j in region r VIFM(j,s) and value added in industry j in region s $\sum_{i=1}^{2} VEFM(i,j,s)$:

$$VOM(j,s) = VIFM(j,s) + \sum_{i=1}^{2} VEFM(i,j,s). \quad (1)$$

This equality simply says that output value equals the sum of all outlays on intermediary inputs and labour and the return to capital. The value of all outlays on intermediary inputs is identified for each commodity j and each region s. Value added is identified for both labour and capital for each commodity j and region s. At this moment, intermediary inputs are not subdivided into more specific categories such as expenses for energy, seed, pesticides, *et cetera*.

The available amount of commodities in a country VOIM(j,r) equals the sum of production and imports.

$$VOIM(j,s)=VOM(j,s)+\sum_{r=1}^{R} VIMS(j,r,s) \qquad (2)$$

Import value VIM(j,r,s) is identified for each commodity j, country of origin r and country of destination s.

There are two possible destinations for the supply available: domestic use and exports VXMD(j,r,s,). Domestic use is subdivided into human consumption VPM(j,s) and other uses VFM(j,s), predominantly food industry demand. Available supply in region s may thus be subdivided into:

$$VOIM(j,r)=VPM(j,r)+VFM(j,r)+\sum_{s=1}^{S} VXMD(j,r,s)\,. \qquad (3)$$

Private consumption VPM(j,r) is identified for each commodity j and region r. Other uses VFM(j,r) are identified for each commodity j and region r. Finally, exports VXMD(j,r,s) are identified for each commodity j, country of origin r and country of destination s.

Private consumption is further subdivided into two categories: domestic origin (VDPM) and imports (VIPM)

$$VPM(j,r) = VDPM(j,r)+VIPM(j,r). \qquad (4)$$

Likewise, other uses are subdivided into domestic origin and imports:

$$VFM(j,r) = VDFM(j,r)+VIFM(j,r). \qquad (5)$$

Consumption and other uses are identified for each commodity j and source region r. Imports are aggregated for this purpose.

### *3.2 Price relations*

HORTUS identifies a great number of prices: producer prices, market prices, export prices, import prices and consumer prices. Figure 1 relates the prices identified in HORTUS. The prices differ from each other due to taxes, subsidies, import and export taxes and subsidies, trade margins and transport costs. In this section, we follow the product from producer to consumer and distinguish all relevant price levels.

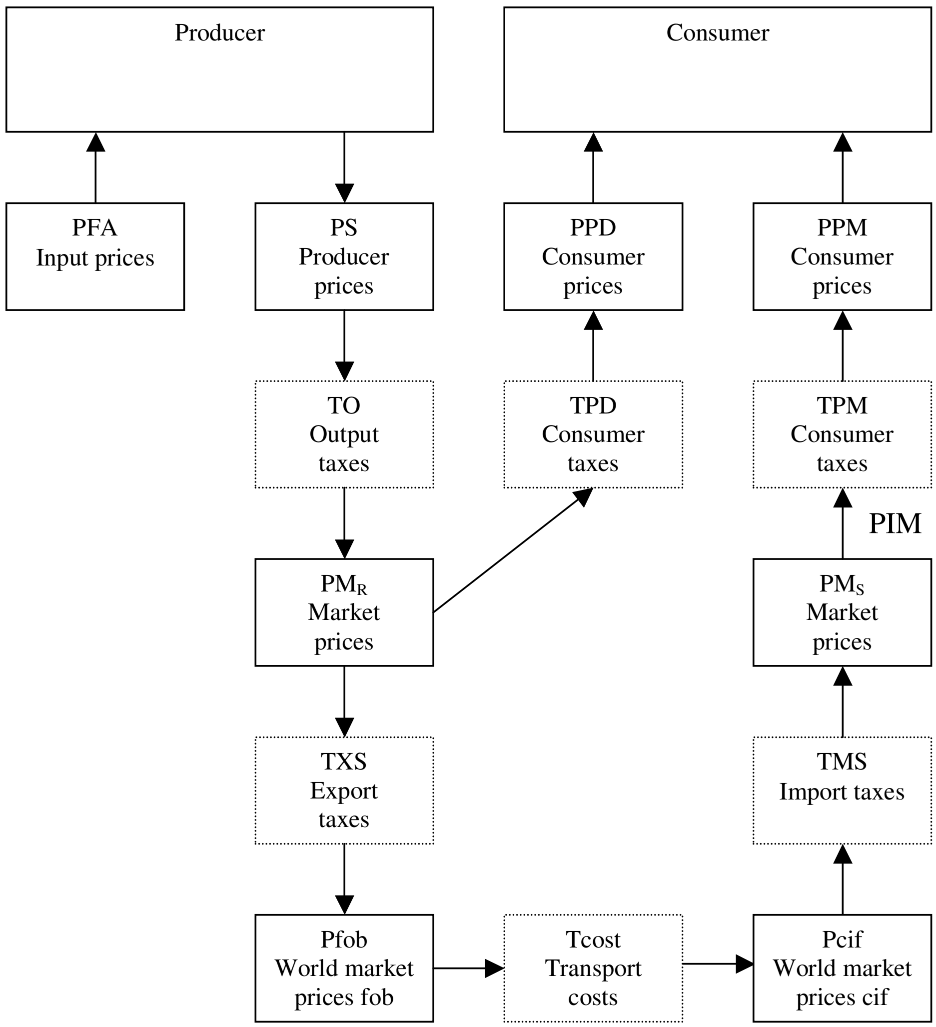


Figure 1. Price relations

The producer receives producer price PS. If the product is taxed or subsidised, output tax TO creates a wedge between the producer price PS and the market price PM. The commodity is sold for domestic use or exports. Consumer tax and trade margins TPD create a wedge between the market price PM and the consumer price PPD. Commodities are exported at export price $P_{fob}$. The difference between the market price PM and the export price $P_{fob}$ is equal to the export tax TXS. Import prices $P_{cif}$ are obtained by adding transport costs $T_{cost}$ to the free on board export prices $P_{fob}$. The market price of imported commodities PMS may be obtained by adding import taxes TMS to the import price $P_{cif}$. Again, for imported products consumer taxes TPM create a wedge between market prices PM and consumer prices PPM. The model also identifies the input prices the producers face as well as the taxes and subsidies on these inputs. These taxes may be used to model e.g. changes in energy policy.

### *3.3 Demand*

Commodity demand depends on a nested CES structure (Figure 2). Demand for all commodities within the nest is determined as a function of the nest's budget share and the prices of all commodities within the nest. The prices of all other commodities only influence the demand of the commodities within the nest in as far as they determine the nest's budget share. The price of Spanish tomatoes determines the budget share of Spanish versus Dutch tomatoes in e.g. Germany and indirectly the budget share of imported versus domestic tomatoes in Germany and even more indirectly the budget share of tomatoes versus other vegetables. Demand substitution between fruits and vegetables on one hand and all other commodities on the other hand is not considered as yet. HORTUS distinguishes nests for fruits and vegetables; ornamentals; and processed fruits and vegetables.

Consumer demand is derived from the following CES function:

$$Y = A\left(\sum_{i=1}^{N} \delta_i y_i^{\alpha}\right)^{1/\alpha} \tag{6}$$

where Y represents the demand for the product group and $y_i$ the demand for the individual commodities, where $Y = \sum y_i$. A, α and $\delta_i$ are parameters where $\sum \delta_i = 1$. Parameter α is related to the elasticity of substitution: σ = 1/(1-α).

The utility maximisation problem for a nest is defined as follows:

$$L = A\left(\sum_{i=1}^{N} \delta_i y_i^{\alpha}\right)^{1/\alpha} - \lambda\left(\sum_{i=1}^{N} p_i y_i - I\right) \tag{7}$$

where I indicates the budget and $p_i$ commodity i's price. Maximising utility gives the following demand function:

$$y_i = \frac{\delta_i^{\sigma} I}{p_i^{\sigma} \boldsymbol{p}^{1-\sigma}} \tag{8}$$

where $\boldsymbol{p} = \left(\sum_{i=1}^{N} \delta_i^{\sigma} p_i^{1-\sigma}\right)^{1/(1-\sigma)}$ represents the price index of Y. Linearising equation (7) gives the following equation to be used in the simulation model:

$$\overline{y}_i = \overline{i} - \overline{\boldsymbol{p}} + \sigma\left(\overline{\boldsymbol{p}} - \overline{p}_i\right) \tag{9}$$

where the 'upper bar' denotes percentage changes.

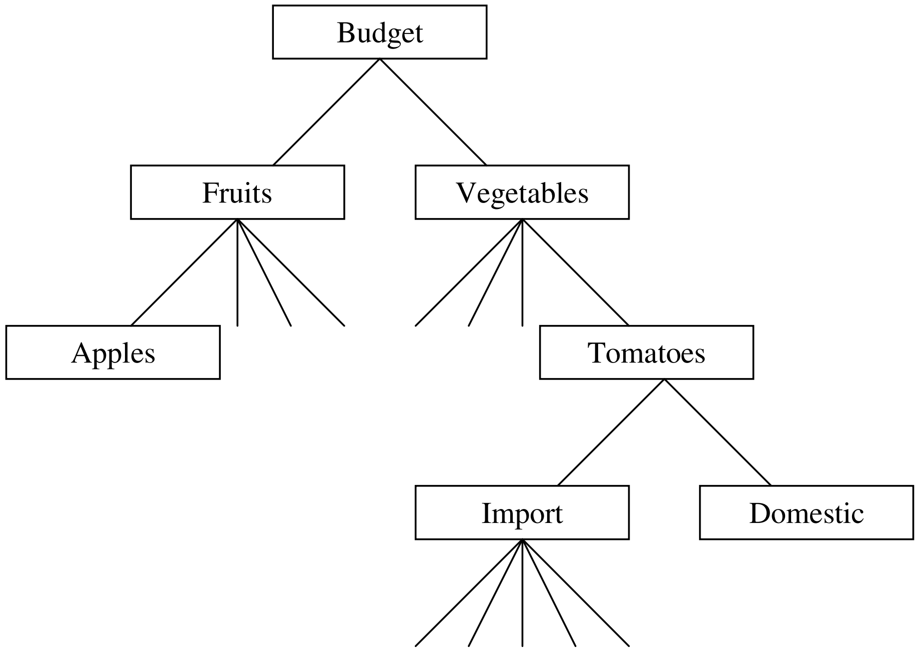


Figure 2. Demand structure

### *3.4 Supply*

The production of each commodity j depends on the input of land, labour, capital and intermediary inputs (Figure 2). Following GTAP, we assume a Leontief relation between intermediary inputs on one hand and land, labour and capital on the other hand. The Leontief relation allows us to neglect intermediary inputs for the moment: there is simply a linear relation between production and intermediary inputs. The relation between the three production factors and output is modelled using a CES production function. Land is more or less a fixed factor whose input is combined with the input of labour and capital. The CES function employed is the following:

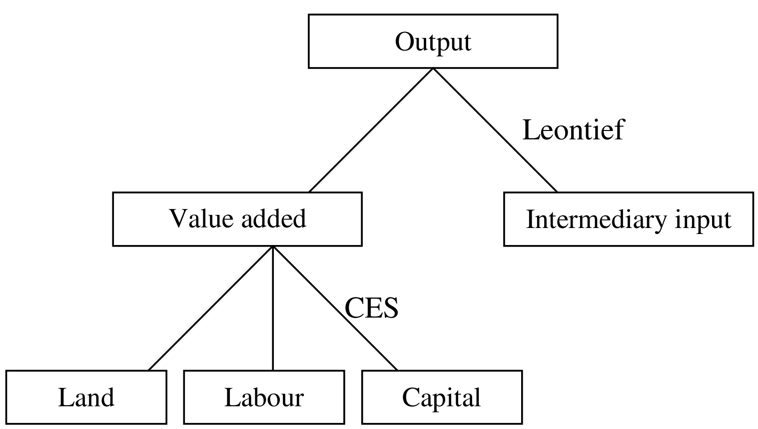


Figure 3. Supply structure

$$y_j = \left(\gamma_{haj} ha_j^{\varphi} + \sum_{i=1}^{M} \gamma_{ij} x_{ij}^{\varphi}\right)^{1/\varphi} \quad (10)$$

where $y_j$ denotes output of commodity j, $ha_j$ acreage employed in the production of commodity j; $x_{ij}$ refers to the quantity of input i used in the production of commodity j; and $\gamma_{ij}$ and $\varphi$ are parameters. The elasticity of substitution $\tau$ is a function of $\varphi$: $\tau = 1/(1-\varphi)$. Acreage is modelled separately from the other inputs, because total acreage available for agricultural (horticultural) uses is more or less fixed and depends - among other things - on government decisions with respect to rural planning.

A representative producer decides on inputs and outputs using cost minimisation and profit maximisation objectives.

$$\max \Pi\left(y_j, ha_j, x_{ij}\right) = \sum_{j=1}^{M} p_j y_j - \sum_{j=1}^{M} \sum_{i=2}^{N} w_i x_{ij} - \mu\left(\sum_{j=1}^{M} ha_j - HA\right) \quad (11)$$

Producer profits equal revenues: price times quantity (over j commodities) minus costs: input prices w times input quantities (over all j commodities and all i inputs). Finally profits depend on one physical constraint: the availability of land for horticultural uses. Profits may be maximised using a three step procedure: (1) deciding on non-land inputs by minimising costs; (2) deciding on output by maximising profits; and (3) deciding on acreage given short run output and price decisions.

*Input demand*
The cost minimisation problem is modelled as follows:

$$\min C\left(x_{ij}\right) = \sum_{j=1}^{M} \sum_{i=2}^{N} w_i x_{ij} - \lambda\left(\sum_{j=1}^{M}\left(\left(\gamma_{haj} ha_j^{\varphi} + \sum_{i=2}^{N} \gamma_{ij} x_{ij}^{\varphi}\right)^{1/\varphi} - y_j\right)\right) \quad (12)$$

where C represents non-land production costs. Minimising costs with respect to $x_{ij}$ gives the following expression for $x_{ij}$ after some tedious substitution:

$$x_{ij} = y_j \left(\frac{\gamma_{ij} \mathbf{w}_j}{w_i}\right)^{\tau} \left(1 - \frac{MP_{haj}}{AP_{haj}}\right)^{1/\varphi} \quad (13)$$

where $\mathbf{w_j} = \left(\sum_{i=2}^{N} \gamma_{ij}^{\tau} w_i^{1-\tau}\right)^{1/(1-\tau)}$ represents the aggregate input price for commodity j. The demand for input i for the production of commodity j depends on the production of commodity j ($y_j$), the price of input i ($w_i$) versus the aggregate input price ($\mathbf{w_j}$) and the returns to non-land factor inputs $\frac{MP_{haj}}{AP_{haj}} = \gamma_{haj}\left(\frac{ha_j}{y_j}\right)^{\varphi}$, where $MP_{haj}$ denotes the marginal product of land for commodity j and

$AP_{haj}$ the average product of land for commodity j, i.e. the yield for commodity j. In a linearised form the demand for factor inputs transforms to:

$$\overline{x_{ij}} = \overline{y_j} + \tau\left(\overline{\mathbf{w_j}} - \overline{w_i}\right) + \pi_j\left(\overline{y_j} - \overline{ha_j}\right). \quad (14)$$

where $\pi_j = \left(\frac{MP_{haj}/AP_{haj}}{1 - MP_{haj}/AP_{haj}}\right)$. The last term on the right hand side models diminishing returns to labour and capital. If output is to increase more than acreage input $\left(\overline{y_j} > \overline{ha_j}\right)$, labour and capital input should increase with a factor $\left(\pi_j\left(\overline{y_j} - \overline{ha_j}\right)\right)$ above the output increase $\left(\overline{y_j}\right)$.

*Supply*

One may derive short-run output $y_j$ (or equivalently short-run price $p_j$) as a function of equilibrium inputs $x_{ij}$ by substituting $x_{ij}$ into the profit function (equation (9)) and maximising this function towards $y_j$. The first order derivative equals

$$p_j = \mathbf{w_j}\left[1 - \frac{MP_{haj}}{AP_{haj}}\right]^{1/\varphi} \quad (15)$$

The supply price $p_j$ depends on aggregate input costs $\mathbf{w_j}$ and diminishing returns to capital and labour input given acreage. Linearising this function gives the short-run inverse supply function:

$$\overline{p_j} = \overline{\mathbf{w_j}} + \pi_j\left(\overline{y_j} - \overline{ha_j}\right) \quad (16)$$

*Acreage*

The last optimisation problem refers to acreage input: how does the producer divide available acreage over the respective commodities to be produced. Maximising profits towards $ha_j$ give the following expression for haj after some tedious substitution:

$$ha_j = \frac{HA\, y_j\left(\gamma_{haj}p_j\right)^{1/(1-\varphi)}}{\left(\sum_{j=1}^{M}\left(y_j\left(\gamma_{haj}p_j\right)^{1/(1-\varphi)}\right)\right)} \quad (17)$$

One may linearise this equation to the following equation:

$$\overline{ha_j} = \overline{HA} + \overline{y_j} + \tau\overline{p_j} - \sum_{k=1}^{M}\left(s_k\,\overline{y_k}\right) - \sum_{k=1}^{M}\left(\tau s_k\,\overline{p_k}\right) \quad (18)$$

where $s_j = ha_j/HA$ denotes the share of the land used for commodity j divided by all land available. Acreage available for commodity j depends positively on total acreage (HA) and the output and price of commodity j ($y_j$ and $p_j$ respectively) and the output and price of all other commodities k ($y_k$ and $p_k$ respectively).

## 4 Data

HORTUS models production, consumption and bilateral for 27 regions: the EU25 - Belgium and Luxemburg are one region - Morocco, Turkey and the Rest of the World. The model specifies eleven product categories, six fruits and five vegetables (Table 2). The model distinguishes four inputs: land (areas), intermediary inputs, labour and capital (values). The model distinguishes human consumption and other uses, notably processing. We have data on processing for grapes, apples, citrus and tomatoes, the most processed fruits and vegetables.

Table 2. Product and country choice

| Vegetables | Fruit | Countries | Inputs |
|---|---|---|---|
| Cucumbers | Apples | EU-25 | Land (area) |
| Onions | Bananas | Morocco | Intermediary inputs |
| Sweet peppers | Citrus | Turkey | Labour |
| Tomatoes | Grapes | Rest of the World | Capital |
| Other vegetables | Pears | | |
| | Other fruit | | |

The data structure contains four elements:
1. Commodity balances;
2. Bilateral trade data;
3. Price information;
4. Cost information.

These data have been collected as follows:
1. The commodity balances relate production and aggregate import (domestic supply) to aggregate exports and domestic use (domestic use). Domestic use is split in human consumption, processing and other uses. Commodity balance information is obtained from FAO and Eurostat. If commodity balance information was not available, we used FAO and Eurostat production and trade data to construct a commodity balance (Bunte and Van Galen, 2005). If we do so, all domestic use is human consumption, unless we have information otherwise.
2. Bilateral trade data are obtained from PCTAS and Eurostat Comext (peppers). Bilateral trade data are matched with aggregate import and exports data in the commodity balances using RAS techniques.
3. The model calculates export price data on basis of the original data on bilateral exports. All other prices have been set equal to these data.
4. RICA cost information has been used to break down production value in input shares. We used information on actual expenses on intermediary inputs and paid labour and capital. We calculated the opportunity costs of unpaid labour and capital. The difference between the production value and actual expenses have been allocated to unpaid labour and capital.

## 5 Results

In this section, we present the results of a reduction of the effective rate of European import barriers with respect to fruits and vegetables with 5.5%. This rate probably is a good approximation of the actual rate of European import barriers (section 2). We assume that this rate applies to all categories of fruits and vegetables distinguished.

The reduction of effective import tariffs has a particularly large influence on aggregate import prices of fruits, in particular bananas and citrus, since both fruits are imported on large scale into Europe (Table 3). This implies that in Europe, fruits prices decrease relative to vegetable prices. Moreover, the prices of bananas and citrus decrease relative to the prices of native fruits.

Table 3. Aggregate import prices in Europe and the Rest of the World

| | EU25 | Morocco | Turkey | ROW |
|---|---|---|---|---|
| Apples | -2,16 | -0,37 | -0,05 | -0,01 |
| Bananas | -5,12 | 0 | 0,20 | 0,21 |
| Citrus | -3,05 | 0,20 | 0,20 | 0,12 |
| Cucumbers | -0,66 | 0 | 0,20 | 0,10 |
| Grapes | -2,71 | 0,19 | -0,01 | 0,14 |
| Onions | -1,54 | 0,05 | 0,20 | 0,09 |
| Other fruits | -2,26 | 0,16 | 0,01 | 0,15 |
| Other vegetables | -1,41 | -0,62 | -0,02 | 0,17 |
| Pears | -2,05 | -0,43 | 0,20 | -0,12 |
| Peppers | -1,33 | 0 | 0,17 | 0,12 |
| Tomatoes | -1,18 | -0,14 | 0,20 | 0,12 |

Consumer demand for domestic fruits and to a lesser extent domestic vegetables decreases. As a result, the producer prices of European fruits fall substantially, while the producer prices of European vegetables fall to a little degree. This implies that in Europe the producer prices of vegetables rise relative to the producer prices of fruits. The opposite holds for Morocco, Turkey and the Rest of the World. As a result, European horticulture shifts land use from fruits to vegetables, while in Morocco, Turkey and the Rest of the World, land use shifts from vegetables to fruits (Table 4). The effects for European fruits production are particularly pronounced for citrus. In Europe, land use will shift from citrus production to grapes and other vegetables production. In Morocco, land use will shift to citrus production. In Turkey, land use will shift to citrus and grapes production. In the Rest of the World, land use will shift to the production of apples, bananas and in particular citrus. Citrus benefits more in the Rest of the World than bananas do, due to substitution effects. Substitution from European production to ROW production is more likely for citrus than for bananas, since European citrus production is substantial, while European banana production is rather small.

Table 5 indicates which European countries are most effected in terms of production. The trade liberalisation is likely to lead to a substantial decrease in Portuguese and Spanish banana production, Spanish and Cyprian citrus production and Dutch and French apple production. This fact is due to the export orientation of these countries for these products. Moroccan production is likely to benefit more than Turkish production, at least in relative terms, since Moroccan production is more export oriented than Turkish production. Turkish production is primarily directed to its home market.

Table 4. Changes in hectare use in Europe and the Rest of the World

| | EU25 | Morocco | Turkey | ROW |
|---|---|---|---|---|
| Apples | -2183 | -492 | -1011 | 37723 |
| Bananas | -281 | -64 | -18 | 21669 |
| Citrus | -22811 | 3091 | 544 | 211654 |
| Cucumbers | 355 | -10 | -499 | -11492 |
| Grapes | 22143 | -752 | 7383 | 4260 |
| Onions | 806 | -419 | -1061 | -13770 |
| Other fruits | -12977 | -633 | -1041 | -69396 |
| Other vegetables | 12005 | -856 | -1928 | -157977 |
| Pears | -253 | -62 | -161 | -2502 |
| Peppers | 548 | -86 | -510 | -7734 |
| Tomatoes | 2582 | 281 | -1710 | -12719 |

The fall in European producer prices leads to a fall in European horticultural output for fruits and for most vegetables. Given the land available for horticultural production, the use of labour and capital falls. The same amount of land is used to produce less output. Horticultural production becomes less labour and capital intensive and more land intensive (Table 6). As a result, the shadow prices of land fall.

## 6 Conclusion

European import liberalization with respect to fruits and vegetables is likely to effect European fruits production more than European vegetables production. Horticultural land use will shift from tropical fruits to native fruits and native vegetables. Export oriented countries such as Spain (bananas and citrus) and France and the Netherlands (apples) face relatively high adjustment costs in terms of shifts in production. Countries whose production depends on export to Europe (Morocco for citrus and tomatoes) are likely to benefit most. The European landscape is also likely to benefit. Horticultural production becomes less labour and capital intensive.

Table 5. Output changes (Percentages)

| | Austria | BelLux | Cyprus | Czech Rep | Denmark | Estonia | Finland | France | Germany | Greece | Hungary | Ireland | Italy | Latvia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apples | -1,29 | -2,43 | 1,57 | -0,39 | 0 | -0,58 | -1,57 | -3,49 | -0,77 | 0,07 | 0,14 | 0 | -1,06 | -0,43 |
| Bananas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Citrus | 0 | 0 | -3,75 | 0 | 0 | 0 | 0 | 0 | 0 | -0,83 | 0 | 0 | -0,71 | 0 |
| Cucumbers | -0,16 | 1,09 | 0,43 | -0,28 | 0,15 | -0,42 | 0,77 | 0,22 | -0,01 | 0,33 | 0,09 | 0,55 | 0,05 | 0,16 |
| Grapes | 0,10 | 0 | -0,15 | 0,02 | 0 | 0 | 0 | 0,07 | -0,07 | -1,66 | 0,24 | 0 | -0,51 | 0 |
| Onions | -0,56 | 0 | 0,41 | 0,22 | -0,40 | -0,14 | 0,63 | -0,26 | -0,64 | 0,28 | 0,20 | 0,05 | -0,17 | 0,15 |
| Other fruits | -1,09 | 0 | 0,30 | -0,88 | -2,11 | 0 | -2,60 | -2,72 | -0,85 | -0,52 | -2,22 | -2,55 | -1,55 | -1,00 |
| Other vegetables | -0,03 | -0,54 | 0,28 | 0,21 | -0,58 | 0,33 | 0,75 | -0,07 | 0,19 | 0,37 | 0,14 | -0,07 | 0,21 | 0,14 |
| Pears | -0,85 | -2,32 | 0,41 | -0,38 | -0,82 | 0 | 0 | -1,80 | -1,39 | -0,74 | -0,44 | 0 | -0,68 | -0,87 |
| Peppers | 0 | -0,31 | 0,33 | -2,07 | 0 | 0 | 0 | 0 | 0 | 0,25 | 0,14 | 0,14 | 0,12 | 0 |
| Tomatoes | -0,23 | 0,20 | 0,06 | -0,05 | -1,31 | 0,15 | 0,25 | -0,11 | -1,04 | 0,36 | 0,12 | 0,50 | 0,22 | 0,22 |

| | Lithuania | Malta | Morocco | Nether-lands | Poland | Portugal | ROW | Slovak Rep | Slovenia | Spain | Sweden | Turkey | UK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apples | -0,39 | 0 | -0,68 | -3,33 | 0,2 | -0,81 | 1,20 | -0,28 | -0,30 | 0,20 | -2,63 | -0,36 | -2,85 |
| Bananas | 0 | 0 | -0,55 | 0 | 0 | -7,88 | 0,92 | 0 | 0 | -3,47 | 0 | -0,45 | 0 |
| Citrus | 0 | -0,10 | 3,10 | 0 | 0 | -0,86 | 2,03 | 0 | 0 | -4,92 | 0 | 0,89 | 0 |
| Cucumbers | -0,57 | 0 | -0,16 | 0,38 | 0,12 | 0,22 | -0,19 | -0,86 | -0,34 | 1,18 | 0,60 | -0,21 | 0,56 |
| Grapes | 0 | -0,49 | -0,49 | 0 | 0 | 0,16 | 0,53 | -0,77 | -0,03 | 0,34 | 0 | 1,96 | 0 |
| Onions | 0,18 | 0 | -0,54 | 0,05 | -0,73 | 0,23 | -0,1 | 0,35 | -0,37 | 0,78 | 0,38 | -0,30 | 0,53 |
| Other fruits | -1,48 | -1,12 | 0,58 | 0 | -0,86 | -0,96 | 0,07 | -0,55 | -2,09 | -2,70 | -3,05 | 0,16 | -3,15 |
| Other vegetables | -0,07 | 0 | 0,11 | -0,22 | 0,18 | 0,19 | -0,17 | 0,29 | -0,27 | 0,49 | 0,46 | -0,11 | 0,32 |
| Pears | -0,70 | -0,31 | -0,55 | -2,62 | -0,82 | -1,19 | 0,22 | -2,21 | -0,25 | -0,03 | -2,16 | 0,13 | -1,94 |
| Peppers | 0 | 0 | -0,06 | -0,53 | 0 | 0 | -0,14 | 0,2 | 0 | 0,32 | 0 | -0,10 | 0,13 |
| Tomatoes | -1,57 | 0 | 2,18 | -0,65 | -0,03 | 0,17 | 0,03 | 0,08 | 0 | 0,48 | 0,24 | -0,18 | 0,70 |

Table 6. Demand for labour and capital, % changes

| | Austria | BelLux | Cyprus | Czech Rep | Denmark | Estonia | Finland | France | Germany | Greece | Hungary | Ireland | Italy | Latvia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apples | -1.44 | -2.89 | 1.07 | -0.56 | -0.47 | -0.69 | -1.94 | -3.64 | -0.96 | -0.27 | -0.05 | -0.21 | -1.30 | -0.58 |
| Bananas | 0 | 0 | -0.49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Citrus | 0 | 0 | -4.24 | 0 | 0 | 0 | 0 | -0.16 | 0 | -1.17 | 0 | 0 | -0.95 | 0 |
| Cucumbers | -0.30 | 0.63 | -0.06 | -0.45 | -0.32 | -0.52 | 0.40 | 0.07 | -0.20 | -0.01 | -0.10 | 0.33 | -0.19 | 0.02 |
| Grapes | -0.05 | -0.46 | -0.64 | -0.16 | 0 | 0 | 0 | -0.09 | -0.26 | -1.99 | 0.05 | 0 | -0.76 | 0 |
| Onions | -0.71 | -0.46 | -0.09 | 0.04 | -0.87 | -0.25 | 0.25 | -0.41 | -0.82 | -0.06 | 0.01 | -0.16 | -0.41 | 0.00 |
| Other fruits | -1.24 | -0.46 | -0.19 | -1.06 | -2.58 | 0 | -2.98 | -2.87 | -1.04 | -0.85 | -2.41 | -2.76 | -1.79 | -1.14 |
| Other vegetables | -0.18 | -1.00 | -0.21 | 0.03 | -1.05 | 0.22 | 0.38 | -0.22 | -0.00 | 0.03 | -0.05 | -0.29 | -0.04 | -0.01 |
| Pears | -1.00 | -2.78 | -0.09 | -0.55 | -1.29 | 0 | 0 | -1.95 | -1.58 | -1.08 | -0.63 | 0 | -0.92 | -1.02 |
| Peppers | -0.15 | -0.77 | -0.16 | -2.25 | 0 | 0 | 0 | -0.16 | 0 | -0.08 | -0.06 | 0 | -0.12 | 0 |
| Tomatoes | -0.38 | -0.26 | -0.43 | -0.23 | -1.78 | 0.04 | -0.12 | -0.27 | -1.22 | 0.02 | -0.07 | 0.28 | -0.02 | 0.08 |

| | Lithua-nia | Malta | Morocco | Nether-lands | Poland | Portugal | ROW | Slovak Rep | Slovenia | Spain | Sweden | Turkey | UK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apples | -0.60 | -0.14 | -0.13 | -3.71 | 0.08 | -0.97 | 1.40 | -0.41 | -0.42 | -0.44 | -2.91 | -0.07 | -3.00 |
| Bananas | 0 | 0 | -0.00 | 0 | 0 | -8.03 | 1.12 | 0 | 0 | -4.11 | 0 | -0.17 | 0 |
| Citrus | 0 | -0.24 | 3.65 | 0 | 0 | -1.02 | 2.23 | 0 | 0 | -5.56 | 0 | 1.18 | 0 |
| Cucumbers | -0.77 | 0 | 0.38 | 0.01 | 0.00 | 0.07 | 0.01 | -0.99 | -0.47 | 0.53 | 0.32 | 0.08 | 0.41 |
| Grapes | 0 | -0.63 | 0.06 | -0.37 | 0 | 0.00 | 0.73 | -0.90 | -0.16 | -0.31 | 0 | 2.25 | -0.14 |
| Onions | -0.03 | -0.14 | 0.01 | -0.33 | -0.85 | 0.07 | 0.10 | 0.22 | -0.49 | 0.13 | 0.11 | -0.01 | 0.39 |
| Other fruits | -1.68 | -1.27 | 1.13 | -0.37 | -0.98 | -1.11 | 0.27 | -0.68 | -2.21 | -3.34 | -3.32 | 0.45 | -3.30 |
| Other vegetables | -0.28 | -0.14 | 0.66 | -0.60 | 0.06 | 0.04 | 0.03 | 0.15 | -0.39 | -0.16 | 0.18 | 0.18 | 0.18 |
| Pears | -0.90 | -0.45 | -0.00 | -2.99 | -0.94 | -1.35 | 0.42 | -2.34 | -0.37 | -0.67 | -2.43 | 0.42 | -2.08 |
| Peppers | 0 | 0 | 0.48 | -0.90 | 0 | -0.15 | 0.05 | 0.06 | -0.12 | -0.33 | 0 | 0.19 | -0.01 |
| Tomatoes | -1.77 | -0.14 | 2.73 | -1.02 | -0.14 | 0.02 | 0.23 | -0.05 | -0.12 | -0.16 | -0.03 | 0.11 | 0.56 |

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