Trade model to assess Euro-Med agreements. An application to the fresh tomato market

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Trade Model to assess Euro-Med Agreements. An application to the fresh tomato market.

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1. Introduction

The analysis of regional trade liberalisation remains an interesting area of research. A large number of countries are taking part in preferential agreements. This is also true for the Mediterranean region.

The commercial integration process among the European Union and a number of countries from the Mediterranean basin has been making progress during last years, within the framework launched in the 1995 Barcelona Conference (see Garcia-Alvarez-Coque, 2002). Within this framework, the EU holds preferential trade agreements (PTAs) with its Mediterranean neighbour countries -or Southern Mediterranean Countries (SMCs)- in the path towards the establishment of the Euro-Mediterranean Free Trade Agreement (EMFTA). The process is quite dynamic and not all SMCs are in the same stage of implementation of their corresponding PTA (ideally, to be completed by 2010).

One major fact of the EMFTA is that there is one major sector that is still excluded from the free trade area provisions: agriculture. The five year programme agreed in the Barcelona Mediterranean Conference (27-28 November 2005) foresees the progressive liberalisation of trade in agriculture, but "*with a possible selected number of exceptions and timetables for gradual and asymmetrical implementation, taking into account the differences and individual characteristics of the agricultural sector in different countries*".

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In order to analyse the possible effects of different paths towards trade liberalization, a great deal of quantitative models has been developed during the last twenty years. Trade models present different characteristics and techniques which are complementary, such as econometrics, input/output tables or equilibrium market models. Among the latter we can distinguish between partial equilibrium (PE) and computable general equilibrium (CGE) models (see Anania, 2001, for a review). While the CGE models take into account the effects of non-agricultural markets and macro-economic variables, PE models do not. However, political resistance to free trade in the EU is concentrated on a small number of products, which are of interest for SMCs as well as for many Southern EU regions, mainly fruit and vegetables. Horticultural markets, which are relevant for SMCs, are full of complexities that are difficult to capture in CGE models.

In fact, the number of contributions modelling horticultural trade in the Mediterranean area is scarce and, when F&V have been considered, it has been in a fairly superficial or general way. Two relatively recent contributions, by Lorca (2000) and Bunte (2005) defined multi-commodity models including some fruit and vegetables, but without a detailed consideration of the policy instruments applied to these products and of the seasonal nature of horticultural trade.

In horticultural markets, non-price factors matter. It is striking that for some products, the actual exports by SMCs to the EU have been below the quantitative limits, suggesting supply constrains faced by these countries but also the fact that the demand is differentiated by quality/origin. This is probably good news for Southern European farmers. In general, for products like fresh fruit and vegetables it is not easy to transform theoretical market opportunities into concrete market realities.

The objective of this Working Paper is to propose a framework for modelling trade reforms related to specific policy instruments for markets of differentiated products, which takes into account the seasonality of policy measures and trade effects. The trade model proposed is applied to the EU fresh tomato import market, though it can easily be extended to other fresh product, where seasonality plays a role.

2. Model foundations

Armington (1969) proposed a Partial Equilibrium method to introduce product differentiation exogenously in trade models by assuming that products are differentiated

by country of origin. This method assumes that imports and domestic goods are imperfect substitutes in demand and a Constant Elasticity of Substitution (CES) functional form for preferences is commonly adopted. The most common Armington models determine import demand in a multi-stage budgeting process, wherein total expenditure is allocated to some good. This expenditure is then divided between imports and domestically produced substitutes, and finally, total imports are allocated across different source countries. A large number of papers have criticised these assumptions on different grounds (see van Tongeren et al., 2001). However, Armington's approach remains to be the most widely used methodology when dealing with heterogeneous products and there are no much better solutions nowadays (see Bureau, 2005; Anania, 2001).

More specifically for fruits and vegetables, Sarris (1983) proposed a derivation from the standard Armingtonian approach, assuming that the export supply of an exporting country is given by a function including the country's price elasticity of export supply and a trend constant. With this specification, the effect of possible quality upgrading of the domestic production that would lead to larger shares of a country's supplies can be accounted for.

Complexity is a word that defines the bilateral trade liberalisation process in the region. This complexity is difficult to represent in a trade model, not only because of the range of instruments still constraining trade but also because of the special nature of the most important traded goods (product differentiation and seasonality). In the EU's horticultural model proposed in the present working document the following cases are considered:

- *Preferences and TRQs.* The formal structure in all EMAs is very similar, although they may differ in the specific quantitative parameters of trade concessions in agriculture (tariff reduction, products covered and quantitative limits). However, tariff concessions are limited to negotiated quantities for a number of "sensitive" products. TRQs can easily neutralise the market access theoretically improved by tariff preferences.

- *Entry prices.* The entry price system applies to a group of fruits and vegetables considered particularly sensitive by the EU. It guarantees that imports are not sold on EU markets below a 'minimum entry price'. This system is in

contradiction with the spirit of tariffication. Third countries apparently accepted this approach as a *quid pro quo* for the continuing opportunity to export to the EU at high prices without facing high tariffs. Significant reductions of entry prices for limited quantities of some products have been negotiated and agreed with Morocco, Egypt and Israel, creating a preference margin.

- *Seasonal windows.* In some periods of the year the EU market seems to be more open to foreign trade than in other periods. A yearly approach for modelling F&V trade flows could hardly catch the complexity of this seasonal regulation and its practical consequences. For this reasons, a model will have as one of its features a seasonal definition of the unknowns, allowing us to make a detailed representation of the changing trade policies that export supplies are facing.

In brief, our intention is to propose a model approach which joins the following characteristics:

1. It is a partial equilibrium model, tailored to model trade impacts of specific policy instruments.
2. It considers imports from different sources as imperfect substitutes, which can be undertaken through and a non-linear Armington type model.
3. The market modelled is the EU-25.
4. The composite demand is formed by different sources, including the intra-EU25 sources plus the most important EU-25 suppliers. The pilot model for tomato, for example, takes the EU-25, Morocco and the Rest of the World (ROW) as major suppliers. The extensions of the model easily increase the number of supply regions.
5. The projections are based on comparative static simulations. In the first versions of the model, there is no significant interdependence between consuming and producing decisions between any given pair of monthly periods. A certain degree of dynamism is included through a shifter to be applied on the supply and demand equations. Future versions of the trade model will define more complex structure on monthly price expectations, which consider monthly production and consumption across the year as the result of a one step choice.

The F&V model draws on the existing knowledge, mainly based on the methodological Armington's foundations though the model follows the approach presented by Francois and Hall (1997)[1]. Nevertheless, our model offers a value-added by a detailed specification of policy impacts through:

1. A detailed specification of policy measures. Thus, the model has to be able to make explicit representation of:
   o TRQs
   o MFN Entry prices
   o Entry prices agreed with selected Mediterranean partners
   o *Ad valorem* and additional tariffs applied to certain F&V
2. Specific estimation of policy impacts on a seasonal basis, if possible at the monthly level.

3. Model equations

Let us define the main model variables and parameters:

Pj is the internal price of good originating at j

P is a composite index of internal prices of product originating at various sources.

Wj is the export price of good originating at j

α_i is the allocation parameter to aggregate imports from different sources.

E is total expenditure on EU imports at internal prices.

k^M is a constant term for the demand for total imports

k^E_j is a constant term for the export supply of good originating at j

σ is the elasticity of substitution

t^o_j is the extra-quota total duty (or the only duty when TRQ is not defined)..

t^w_j is the price wedge on country j imports.

η is the elasticity of demand for total imports, including intra-EU and extra-EU partners' goods.

μ_j is the export supply of good originating at j to the EU market.

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[1] A similar approach, though using linear equations can be found in Sarris (1983).

$M^q j$ is the total quota volume for product originating at j

Mj = import flow originating at j

q = total composite demand.

Xj = export flow originating at j

Model description

For the sake of easing the model description, we assume in the next equations that preferential suppliers are not constrained by tariffs (though they could be restricted by TRQs). However, the model extension to the case where tariffs also apply to preferential suppliers is straightforward. Moreover, the actual empirical exercises are based on the fact that preferential suppliers are actually facing tariffs.

Demand side:

We first define the composite good, q, as a CES composite of intra-EU good and imports from different regions. Total composite good demand can be described by a demand standard equation:

$$q = k^M P^\eta \qquad [1]$$

The price P is an index of prices of the imports originated at various regions:

Import price index: $P = \left[\sum_{i=1}^{n} \alpha_i^\sigma P_i^{1-\sigma} \right]^{1-1/\rho}$, where $\rho = (\sigma-1)/\sigma$

While equation [1] represents the total EU import demand, i.e., for tomato, we need to describe the specific demand for imports from the considered regions. Thus, the import demand of good originating at region j is:

$$Mj = \left[\frac{\alpha_j}{P_j} \right]^\sigma P^{\sigma-1} E \qquad [2]$$

Consequently, the demand side is defined by a composite import demand plus specific demands for imports from different exporting regions.

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Supply side:

Supply functions are specified as a function with constant supply elasticity. Again, imports originating at various regions are separately modelled. Thus, supply of imports originating at j:

$$X_j = k_j^E [Wj]^{\mu_j} \qquad\qquad [3]$$

The relation between internal prices and export prices being this:

$$Wj = \frac{P_j}{(1 + t_j^w)}$$

where $t_j^w \leq t_j^o$.

Note that a price wedge is defined when imports face TRQs. In the basic formulation a preferential supplier not constrained by TRQs, when these are not binding, $t_j^w = 0$. When TRQs are binding, then a price wedge is defined and has to be calculated endogenously. When exports are over the TRQ limits, then the maximum price wedge is applied, which is, for this case, equal to the maximum tariff t_j^o.

Actually, in the first applications of the model, a differentiation is made, for each supplier, between the actual tariff applied, on the one hand, and the price wedge resulting of the implementation of TRQs, on the other.

System equations:

The model is finally constructed through a system of non-linear equation, which can be solved through the use of GAMS programming.

The equations to be solved are:

1. Excess of demand good originating at j must be zero:

$$Mj - X_j = 0$$

Replacing import demand (equation [2]) and import supply (equation [3]) the excess demand condition is:

$$\left[\frac{\alpha_j}{P_j}\right]^{\sigma} P^{\sigma-1} E - k_j^E [Wj]^{\mu_j} = 0 \quad j = 1......n$$

Replacing Wj by its value in terms of Pj:

$$\left[\frac{\alpha_j}{P_j}\right]^{\sigma} P^{\sigma-1} E - k_j^E \left[\frac{P_j}{(1+t_j^w)}\right]^{\mu_j} = 0 \quad j = 1......n \qquad [4]$$

2. Total import demand. This can be expressed as follows:

$$k^M P^{\eta+1} - E = 0$$

Note that the equation above is specified just by multiplying the composite demand for the composite price and rearranging.

3. Total price index: $P - \left[\sum_{i=1}^{n} \alpha_i^{\sigma} P_i^{1-\sigma}\right]^{1-1/\rho} = 0 \qquad [5]$

Then the system to solve is formed by $n + 2$ equations and $n + 2$ unknown variables (n prices, total expenditure E and composite price P).

TRQs:

As indicated above the price wedge for preferential suppliers can get three kinds of values, depending on the size of imports compared to the applied TRQs. For cases where preferential tariffs are nil:

a) $Mj < M^q j$ then $t_j^w = 0$

b) $Mj = M^q j$ then $0 < t_j^w < t_j^o$, and t_j^w is estimated endogenously.

c) $Mj > M^q j$ then $t_j^w = t_j^o$

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<u>Calibration</u>

Calibration is based on unit price normalisation, so that all constants are equal to benchmark expenditures. If a TRQ is binding we have to propose a value for the reference price wedge. However, if $Mj > M^qj$ then the price wedge is taken as the initial out-of-quota tariff t^o_j .

4. Market equilibrium in presence of TRQ and positive preferential tariffs

The next three figures represent the market equilibrium including the presence of TRQs, considering the case where preferential imports are subjected to a positive preferential tariff t^i_j (Subscripts "j" are not included in the following graphical description for the sake of simplicity). See Abbot (2002) for a thorough analysis of market equilibrium when TRQs apply.

Figure 1. M < M^q
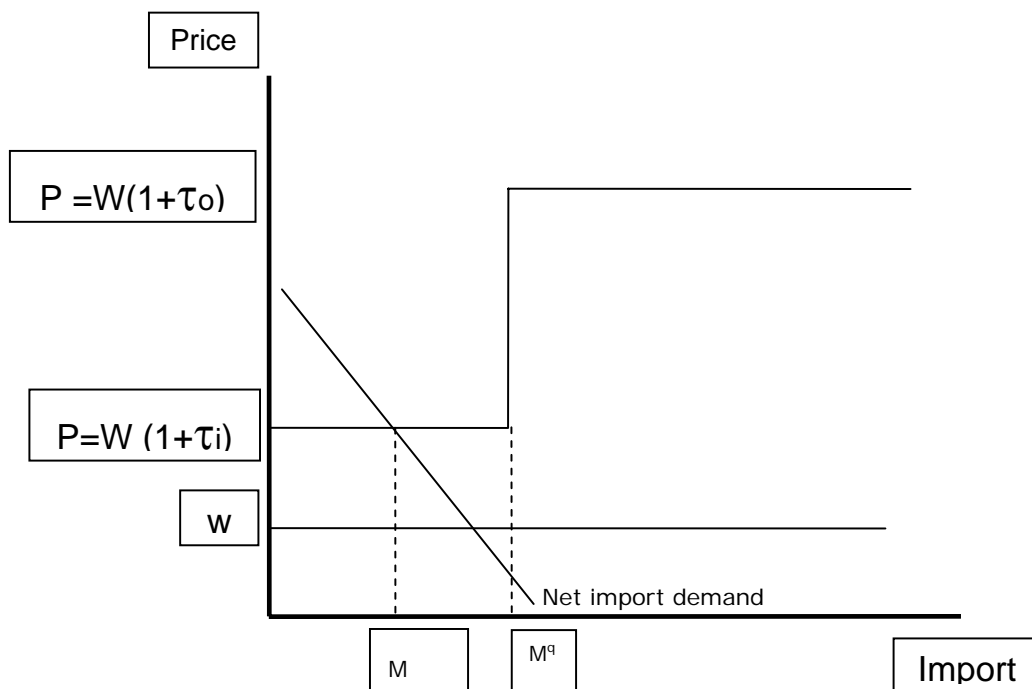
Here the applied tariff is the preferential tariff $t^i > 0$. As a matter of fact, this is a case where market equilibrium is not constrained by the existence of a quota.

In this case, the equilibrium equations [4] will be given by:

$$\left[\frac{\alpha_j}{P_j}\right]^{\sigma} P^{\sigma-1} E - k_j^E \left[\frac{P_j}{(1+t_j^i)}\right]^{\mu_j} = 0 \quad j = 1......n$$

Figure 2. M = M^q
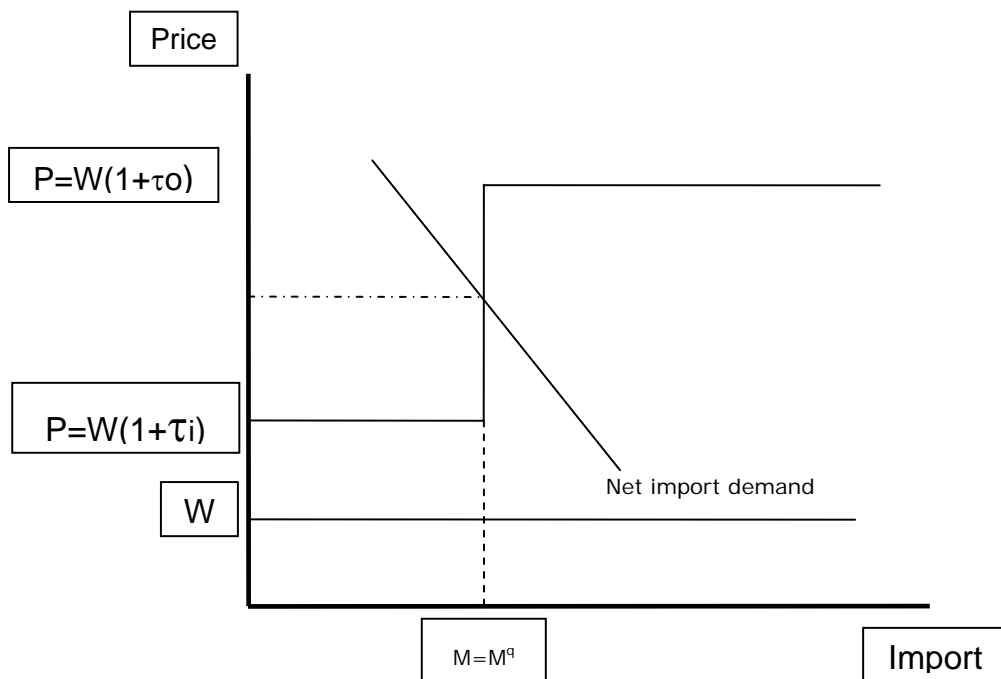
Here the total tariff is $t^i + t^w$, where t^w is the price wedge estimated endogenously. Because a new variable has been added, a new equation to the system specified above has to be added:

$$M^q j = \left[\frac{\alpha_j}{P_j}\right]^{\sigma} P^{\sigma-1} E;$$

where the import demand matches the TRQ level M^{q}j.

Figure 3. M > M�q

Figure 3. M > Mᵠ
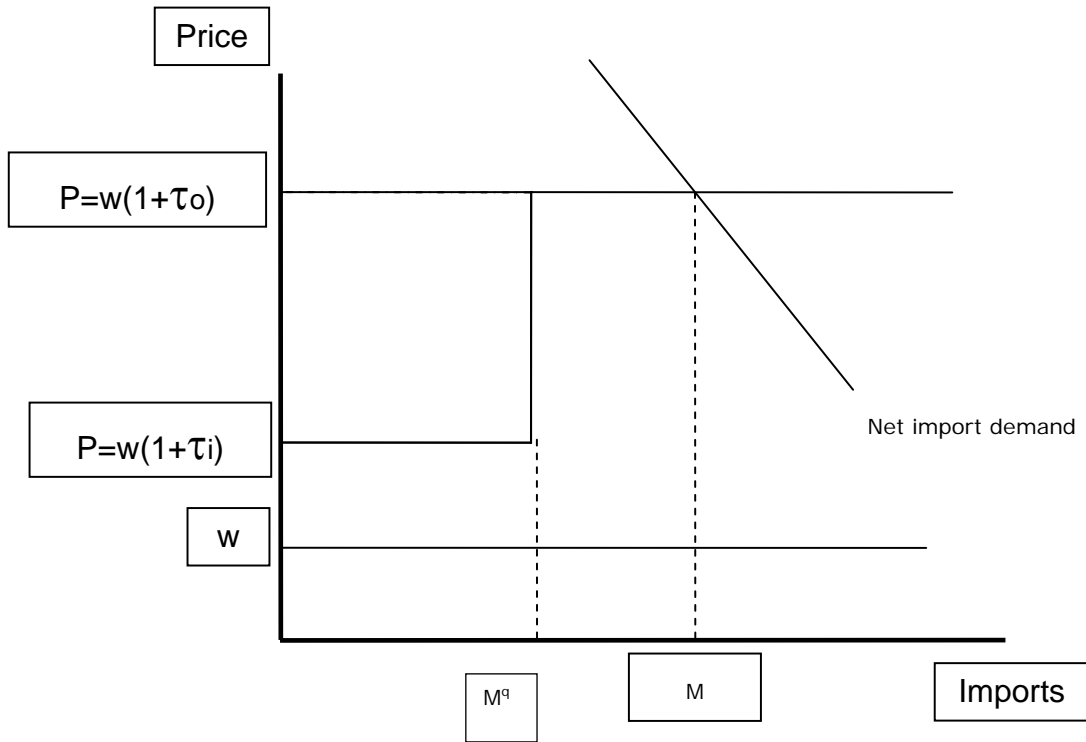
In the last figure the total tariff is t^o, where t^o is the out-of-quota tariff. The equilibrium equations [4] will be written as follows:

$$\left[\frac{\alpha_j}{P_j}\right]^\sigma P^{\sigma-1}E - k_j^E\left[\frac{P_j}{(1+t_j^o)}\right]^{\mu_j} = 0 \quad j = 1......n$$

In tomato and other fruit and vegetables, non preferential tariffs and entry prices are applied when trade flows exceed the TRQ. According to Grethe et al. (2005), the quota system may also tend to transfer a part of the economic rent to the importing companies, as these could offer low prices to the exporters, on the worst-case assumption that the full MFN tariff has to be paid, at least when there is a risk of exceeding the TRQ. In the case of Moroccan tomato exports, Chemnitz and Grethe (2005) suggest that according to the structure of the Moroccan export sector, it is likely that a part of the quota rent ends up at the Moroccan side. The basic F&V trade model presented in this document actually assumes that quota rents are captured by the importer. An obvious extension would be to adjust the export price of product originating at a given region by the part of the rent captured by the preferential exporter:

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$$Wj' = Wj + (1 - \chi)(QR/M^q{}_j)$$

where Wj' is the adjusted border price, QR denotes Quota-Rent, and χ is the share of the QR that is captured by the importer.

5. Model application. Policy measures in the benchmark scenario

Tomato is a good illustration and very relevant for the EU agriculture (see Garcia-Alvarez-Coque at al. 2006). EU tomato market is a good example of : (i) protection levels which change from a month to the next; (ii) specific border measures, such as entry prices and TRQs; (iii) tariff concessions to Mediterranean countries, in the form reduced "agreed entry prices" and tariff levels.

Entry prices

The entry price system applies to a group of fruits and vegetables considered particularly sensitive by the EU. It guarantees that imports are not sold on EU markets below a 'minimum entry price'. Additional tariffs are added, according to a given table that specifies the specific tariff level for the declared or calculated levels of import prices below given percentages of the entry price.

A detailed description of the entry price system can be found in Swinbank and Ritson (1995) and Grethe and Tangermann (1998). When imports are valued above the entry price, only an *ad valorem* duty is charged. When import values are below the entry prices, but not more by 8 per cent below, an additional duty is charged which equals the difference between the entry price and the import price. If, however, the import price is lower than 8 per cent below the entry price, an additional tariff (called Maximum Tariff Equivalent, MTE) will be charged in addition to the *ad valorem* tariff. The entry price system is not only complex to apply from the administrative point of view. It just acts as a "minimum price". When import prices are below 92 per cent of the entry price the size of the full tariff (MTE plus the *ad valorem* duty) can be considerable. For tomatoes, the MTE can reach 298 Euro/ton. The entry price system seems to offer opportunities for circumvention by importers, either legally or illegally. In practice, importers tend to declare a CIF price above the entry price, intending not to pay any additional charge. Much of the fruit and vegetable trade is on consignment and no agreed CIF price exists

when the import is carried out. To simplify the system, import prices are usually monitored at the wholesale EU markets, where prices can be registered by origin. Significant reductions of entry prices for limited quantities of some products have been negotiated and agreed for certain Mediterranean partners. The Entry prices and periods of application for non-preferential third countries and for Morocco are given in Table 1.

To facilitate the system implementation, the EU publishes Standard Import Values (SIV) for each major origin. The SIVs are the average of observed wholesale market prices for tomatoes from each origin in the EU minus a marketing and transportation margin. The SIV are compared with the entry prices to evaluate whether an additional tariff has to be charged and, if this is the case, to calculate the size of the additional tariff.

Table 1. Entry Prices, periods of application and reduced entry prices for Morocco

Product and period	Entry price MFN	Entry price Morocco
Tomatoes from 1 to 30 April	1126	461
Tomatoes from 1 to 31 May	726	461
Tomatoes from 1 June to 30 September	526	526
Tomatoes from 1 October to 20 December	626	461
Tomatoes from 21 December to 31 December	676	461
Tomatoes from 1 January to 31 March	846	461

Table 2 supplies information on average monthly entry prices and SIV for Morocco and for third countries for 2004. Full tariffs are the result of adding all charges on imports, which in turn depend on the level of SIV compared to the corresponding entry price[2]. *Ad valorem* tariffs are added to the additional tariff produced when the entry price system is undercut. Although additional tariffs related to the entry price system are specific, all duties have been expressed in *ad valorem* equivalents.

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[2] Detailed calculation, with specification of the corresponding additional tariff and the ad valorem tariffs aplicable in each period are available at authors' request.

We found that the MTE (29.8 euro/100 Kg) was applicable for Moroccan imports in January, February and April, and for MFN suppliers in January and April. A smaller additional tariff of 3.2 euros/100 Kg was applied on both MFN and Moroccan imports in July. In some months, the additional tariffs were not applied and only the *ad valorem* tariff was applied. This happened for MFN tomatoes during all the year, except for January, April and July; and for Moroccan tomato, except for January, February, April and July. It is striking that, in percentage terms, some full tariff equivalents for MFN are lower than the calculated for Morocco, though this country is a preferential supplier. This happened, for example, in February 2004. The reason for this is that the SIV for MFN sources is normally higher than for Moroccan tomato. This leads, on the one hand, to a higher denominator in the percentage calculation for Morocco (January and April). And, on the other hand, to the fact that Moroccan tomato sometimes undercuts its corresponding entry price, while this does not happen for MFN tomato (February). This leads to the conclusion that an imperfect substitution model is needed to capture the product heterogeneity of the world market for tomato.

Table 2. Entry prices, standard import values and full tariffs for Morocco and MFN suppliers (tomato).

2004	Entry price MFN	Entry price Morocco	SIV MFN	SIV Morocco	Full Tariff MFN AVE %	Full Tariff Morocco AVE %
	In euro/100 Kg		In euro/100 Kg			
January	84,6	46,1	64,2	38,4	55,2	77,6
February	84,6	46,1	86,8	37,5	8,8	79,5
March	84,6	46,1	100,4	79,3	8,8	0,0
April	112,6	46,1	83,5	28,2	44,5	105,7
May	72,6	46,1	84,5	64,3	14,4	0,0
June	52,6	52,6	107,4	60,4	14,4	5,7
July	52,6	52,6	49,6	49,9	20,9	12,1
August	52,6	52,6	62,9	62,9	14,4	5,7
September	52,6	52,6	66,6	66,6	14,4	5,7
October	62,6	46,1	75,8	75,8	14,4	5,7
November	62,6	46,1	85,2	83,7	8,8	0,0
December	62,6	46,1	123,6	88	8,8	0,0

Source: European Commission and authors' calculations.

AVE: Ad Valorem Equivalent: Result of summing up all the tariffs charged on imports and expressing them as a percentage of the SIV. Moroccan tariffs are in-quota tariffs

The table illustrates the variations in the degree of protection faced by Moroccan and MFN tomato exporters along the year. Full tariffs for Morocco in Table 4 actually

reflect the size of the preferential tariff t^i_j (see below for a discussion on the out-of-quota tariff). Full tariffs for MFN suppliers represent their $t^i_j = t^o_j$ tariffs (actually, there is no margin of preference). The pattern of protection shows higher levels for the period January-April. Tomato appears to be a quite sensitive product for the EU during such period.

Tariff-Rate Quotas

Moroccan preferences are restricted by Tariff Rate Quotas (TRQ). The issue of increasing the size of the quantitative limit for Moroccan tomato exports has been capital in the subsequent reviews of the Association Agreement's agricultural provisions. In the current Protocol, approved in 2003, during the period October to May, TRQs are applied for Moroccan exports with complete duty elimination (though the entry price still applies). Each of these months belonging to the time span have a different TRQ volume, ranging from 4,000 tonnes for May to 30,000 tonnes for December, January, February and March each. Table 3 presents the monthly export data of Moroccan tomatoes in 2004 and compare actual flows with agreed TRQs.

Table 3. Moroccan tomato trade. Actual flows and TRQs

2004	Trade flow	TRQ
January	33388,9	30000
February	26762,7	30000
March	33571,8	30000
April	15874,6	15000
May	7957,9	4000
June	2484,3	
July	51,4	
August	0	
September	0	
October	3998,1	10000
November	27272,9	26000
December	39830,3	30000

Source: European Commission, COMEXT.

To run the model, we can assume that TRQs are binding in January, March, April, May, November and December. In these periods, we can assume that the tariff for Moroccan imports is the out-of-quota equivalent tariff.

Modelling preferences with entry prices and TRQs

If we have a look to the Moroccan SIV level compared to the Entry Price level, in Table 2; and to the actual Moroccan imports compared to the TRQs (Table 3), we find a number of reference situations, which reflect the complexity of EU tomato trade policies, even for preferential suppliers. The situations are shown in following table:

Table 4. Reality under the agreement

| | Moroccan price: | | Actual trade > TRQ ? |
	Undercuts MFN EP ?	Undercuts Agreed EP ?	
January	Yes	Yes	Yes
February	Yes	Yes	No
March	Yes	No	Yes
April	Yes	Yes	Yes
May	Yes	No	Yes
June	No	No	No TRQ
July	Yes	Yes	No TRQ
August	No	No	No TRQ
September	No	No	No TRQ
October	No	No	No
November	No	No	Yes
December	No	No	Yes

Only in June, August, September and October, Moroccan imports appear not to be constrained by Entry Prices (EP) nor by TRQs. In March, May, November and December, the only constrain is the TRQ, but is clear that in March and May the Moroccan trade is favoured by the reduced agreed EP and that the loss of preference could have serious consequences because the Moroccan price undercuts the MFN Entry Price. In February and July Moroccan exports are constrained by the EP but TRQ are not constraining the import flows. Finally, in January and April, Moroccan trade is constrained by both the EP and the TRQ, and there is not a clear advantage of being a preferential supplier with respect to MFN suppliers.

The fact that there is an Entry price for Moroccan imports (within a quantity limit) and an Entry price for MFN imports, leads us to consider three possible situations, in order to calculate the size of the minimum (preferential) tariff t^i_j and maximum tariff t^o_j to be applied to Moroccan imports to the EU market:

- When Moroccan import price > MFN Entry price:

t^o_j = x % MFN Ad Valorem Tariff
t^i_j = 0

where "x" refers to an agreed percentage of reduction for preferential suppliers. This percentage of reduction for Moroccan tomato is 60 percent.

- When MFN Entry price > Moroccan import price > Agreed Entry price:

t^o_j = x % MFN Ad Valorem Tariff + Additional Tariff
t^i_j = 0

The additional tariff is the corresponding tariff which triggers when the entry price is undercut. The agreed entry price is the reduced entry price presented in the second column of Table 4 foreseen in the EuroMediterranean Association Agreement.

- Moroccan import price < Agreed Entry price

t^o_j = x % MFN Ad Valorem Tariff + Additional Tariff
t^i_j = Additional Tariff

This last situation happens when the additional tariff is charged on Moroccan imports because even the agreed the entry price is undercut. Note that t^o_j is the total charge that would be applied on Moroccan imports, if they would not receive the preferential treatment anymore, which is the case, for example, when the TRQ is overcome.

Table 5 shows the monthly effective tariffs t^i_j and t^o_j for Moroccan tomato, which have been calculated from 2004 data, i.e. SIV, entry prices and full tariffs (*ad valorem* tariffs plus additional tariffs related to the entry price system). Tariffs are expressed in their *Ad Valorem* Equivalents.

Table 5. In-quota and out-of-quota tariffs on Moroccan tomato imports (2004)

Month	t^i_j (% SIV)	t^o_j (% SIV)	SIV with respect MFN and agreed entry prices
January	77,6	81,1	SIV < Agreed EP
February	79,5	83,0	SIV < Agreed EP
March	0,0	41,1	Agreed EP < SIV < MFN EP
April	105,7	109,2	SIV < Agreed EP
May	0,0	52,1	Agreed EP < SIV < MFN EP
June	5,7	5,7	SIV > MFN EP
July	12,1	12,1	SIV < Agreed EP
August	5,7	5,7	SIV > MFN EP
September	5,7	5,7	SIV > MFN EP
October	5,7	5,7	SIV > MFN EP
November	0,0	3,5	SIV > MFN EP
December	0,0	3,5	SIV > MFN EP

Source: European Commission, TARIC and authors' calculations

It appears that the only periods in 2004 when the agreed (reduced) entry price really made a difference in favour of Morocco where March and May. In the rest of the year, either Moroccan prices were above the entry price (June, August to December), or the entry price system penalised both MFN and Morocco's exports (January, February, April and July.

6. Trade policy scenarios

The preliminary version of the F&V trade model is applied to study the trade impacts of several scenarios of trade liberalisation in the EU fresh tomato market. These scenarios are the following:

- Enlarging Moroccan tomato TRQs ("*Enlarged TRQs*")
- Reducing or Eliminating Agreed Entry Prices ("*Agreed Entry prices*")
- Reducing or Eliminating MFN Entry Prices ("*MFN Entry prices*")
- Converting entry prices into Equivalent Tariffs and reducing them by 50% ("*Tariffication A*")

- Applying an uniform tariff across the year ("*Tariffication B*")
- Preference erosion

1. Enlarging Moroccan tomato TRQs (Enlarged TRQs)

We will assess the impact of increasing the TRQs by 50%, leading to the next allocation table:

Table 6. EU Imports from Morocco (Tons).
Actual trade and TRQs, and enlarged TRQ by 50%.

Month	Actual trade	Actual TRQ	Conterfactual TRQ
January	33388,9	30000	45000
February	26762,7	30000	45000
March	33571,8	30000	45000
April	15874,6	15000	22500
May	7957,9	4000	6000
June	2484,3		
July	51,4		
August	0		
September	0		
October	3998,1	10000	15000
November	27272,9	26000	39000
December	39830,3	30000	45000

In the counterfactual scenario all new TRQ are not binding except for May. Market equilibrium for most months (excepting for May) will correspond to the one depicted in Figure 1. Because the new TRQ is still binding in May, the t_j^o will keep being the price wedge 52.1% (Table 5). However, the size of the quota rent will increase with the TRQ enlargement. We still assume in the preliminary model that quota rents are captured by the importers.

2. Reducing or Eliminating Agreed Entry Prices ("Agreed Entry prices")

We assume in this scenario that the entry price agreed with Morocco within the Association Agreement is phased out. This means that the additional tariff triggered by the entry price system for Morocco is phased out. As seen in the next table, a significant reduction of tariffs would take place. Only the ad valorem tariffs remain.

Table 7. Phasing out "agreed entry price". Actual and counterfactual tariffs (%)

Month	Actual		Counterfactual	
	In-quota	Out-of-quota	In-quota	Out-of-quota
January	77,6	81,1	0	3,5
February	79,5	83	0	3,5
March	0	41,1	0	3,5
April	105,7	109,2	0	3,5
May	0	52,1	0	5,7
June	5,7	5,7	5,7	5,7
July	12,1	12,1	5,7	5,7
August	5,7	5,7	5,7	5,7
September	5,7	5,7	5,7	5,7
October	5,7	5,7	5,7	5,7
November	0	3,5	0	3,5
December	0	3,5	0	3,5

3. Reducing or Eliminating MFN Entry Prices ("MFN Entry prices")

If entry prices are phased out, this has an impact not only on Moroccan as well as MFN imports. Tariffs on tomato from Morocco would achieve the levels displayed in Table 8. MFN tariffs in the actual and counterfactual scenarios would be as follows:

Table 8. Phasing out MFN entry price.

Actual and counterfactual tariffs (%) faced by Moroccan tomatoes

Month	Actual %	Counterfactual %
January	55,2	8,8
February	8,8	8,8
March	8,8	8,8
April	44,5	8,8
May	14,4	14,4
June	14,4	14,4
July	20,9	14,4
August	14,4	14,4
September	14,4	14,4
October	14,4	14,4
November	8,8	8,8
December	8,8	8,8

As indicated in the table, only a*d valorem* tariffs would remain.

4. *Converting entry prices into Equivalent Tariffs and reducing them by 50%* (*"Tariffication A"*)

This scenario would be the result of taking the initial tariff equivalents (Tables 2 and 5) and reducing them by 50%. Because it is probable that a specific tariff component will be maintained, the *ad valorem* equivalents may be different between the MFN suppliers and Morocco.

Table 9. Tariffication and 50% tariff reduction

2004	Actual			Counterfactual		
	MFN %	In-quota Morocco %	Out-of-quota Morocco %	MFN %	In-quota Morocco %	Out-of-quota Morocco %
January	55,2	77,6	81,1	27,6	38,8	40,6
February	8,8	79,5	83	4,4	39,8	41,5
March	8,8	0,0	41,1	4,4	0,0	20,6
April	44,5	105,7	109,2	22,3	52,9	54,6
May	14,4	0,0	52,1	7,2	0,0	26,1
June	14,4	5,7	5,7	7,2	2,9	2,9
July	20,9	12,1	12,1	10,5	6,1	6,1
August	14,4	5,7	5,7	7,2	2,9	2,9
September	14,4	5,7	5,7	7,2	2,9	2,9
October	14,4	5,7	5,7	7,2	2,9	2,9
November	8,8	0,0	3,5	4,4	0,0	1,8
December	8,8	0,0	3,5	4,4	0,0	1,8

Source: European Commission and authors' calculations.

5. *Applying an uniform tariff across the year* ("*Tariffication B*")

The weighted yearly average of the MFN tariff is 19.22%. It is assumed that all previous tariffs on MFN products are replaced by this tariff for all months of the year. A preference on imports from Morocco is assumed to be kept by decreasing in-quota the Moroccan tariff to nil level and keeping the out-of-quota tariff to a 40% of the MFN level:

Table 10. Tariffication: uniform tariff

2004	Actual			Counterfactual		
	MFN %	In-quota Morocco %	Out-of-quota Morocco %	MFN %	Preferential Morocco %	Out-of-quota Morocco %
January	55,2	77,6	81,1	19.2	0	7,7
February	8,8	79,5	83	19.2	0	7,7
March	8,8	0,0	41,1	19.2	0	7,7
April	44,5	105,7	109,2	19.2	0	7,7
May	14,4	0,0	52,1	19.2	0	7,7
June	14,4	5,7	5,7	19.2	7,7	7,7
July	20,9	12,1	12,1	19.2	7,7	7,7
August	14,4	5,7	5,7	19.2	7,7	7,7
September	14,4	5,7	5,7	19.2	7,7	7,7
October	14,4	5,7	5,7	19.2	0	7,7
November	8,8	0,0	3,5	19.2	0	7,7
December	8,8	0,0	3,5	19.2	0	7,7

Source: European Commission and authors' calculations.

6. Preference erosion

There are many possible scenarios leading to a tariff reduction on MFN imports while keeping protection on Moroccan imports. In this exercise, we take the scenario number 4 and assume that tariff reduction only applies to MFN suppliers.

Table 11. Preference erosion

2004	Actual			Counterfactual		
	MFN %	In-quota Morocco %	Out-of-quota Morocco %	MFN %	In-quota Morocco %	Out-of-quota Morocco %
January	55,2	77,6	81,1	27,6	77,6	81,1
February	8,8	79,5	83	4,4	79,5	83
March	8,8	0,0	41,1	4,4	0,0	41,1
April	44,5	105,7	109,2	22,3	105,7	109,2
May	14,4	0,0	52,1	7,2	0,0	52,1
June	14,4	5,7	5,7	7,2	5,7	5,7
July	20,9	12,1	12,1	10,5	12,1	12,1
August	14,4	5,7	5,7	7,2	5,7	5,7
September	14,4	5,7	5,7	7,2	5,7	5,7
October	14,4	5,7	5,7	7,2	5,7	5,7
November	8,8	0,0	3,5	4,4	0,0	3,5
December	8,8	0,0	3,5	4,4	0,0	3,5

Source: European Commission and authors' calculations.

7. Simulations' results

Each one of the defined scenarios is assessed through running the F&V model. This consists of the equation system specified in Section 6. Equations are written in GAMS code. The preliminary simulations have been run assuming that the

- elasticity of substitution σ is the elasticity of substitution = 5;

- composite demand for imports' elasticity η = 1;

- export supply elasticity for intra-EU good μ_1 = 2;

- export supply elasticity for each origin μ_j = 2;

The results displayed below have to be considered as "exercise simulations". The value chosen for the elasticity of substitution is quite representative of a market where products are quite homogeneous (low product differentiation), so it is likely that the substitution effects are overestimated. In further developments of the F&V trade model, more realistic values for demand and supply elasticities will be included, drawing on the available econometric literature. Sensitivity analysis can be easily carried out by changing the parameters in the GAMS file written for the model.

Simulations results for EU tomato imports are presented as percentage changes and absolute values with respect to benchmark sales, which are presented in the Table 12 below. Border and internal prices percentage changes corresponding to each source are computed.

Table 12. EU tomato imports (tons)

2004	Intra EU25	ROW	Morocco
January	198280,6	6954,3	33388,9
February	191838	5970	26762,7
March	193730,8	7103,9	33571,8
April	187170,5	3943,4	15874,6
May	199144,5	1870,5	7957,9
June	188184,5	3036,7	2484,3
July	187460,4	1289,9	51,4
August	191961,1	375,4	0
September	173361,9	3424,8	0
October	141407,3	4488,7	3998,1
November	147740,4	4210,8	27272,9
December	182621,6	10375,1	39830,3

Source: COMEXT and authors' calculations

The simulation results are summarised in Tables 13 to 15.

The summary Table 13 shows that impacts of trade liberalisation are different depending on the scenario chosen. The removal of entry prices and the tariffication scenarios have relatively larger trade effects. Every scenario including the removal of border measures largely benefits imports from Morocco, except for the preference erosion scenario. This suggests that for this country, multilateral trade liberalisation is as important as bilateral trade liberalisation concerning the EU fresh tomato market. A TRQ enlargement would have less dramatic impact on Moroccan sales as these seem constrained by the entry price system. Preference erosion does not appear a big issue for Moroccan exporters.

Table 13. Impacts of trade liberalisation on fresh tomato market (2004)

Summary (yearly data: 2004)

	Percentage (%)			Quantities (tonnes)		
Scenario	EU	MO	ROW	EU	MO	ROW
Enlarged TRQ	-0,43	10,86	-1,56	-9361	20757	-829
Agreed Entry Price	-5,70	174,98	-14,33	-124497	334543	-7600
MFN Entry Price	-5,86	171,80	11,14	-127979	328477	5911
Tariffication A	-2,45	55,92	22,05	-53432	106914	11698
Tariffication B	-5,01	151,36	-11,52	-109339	289398	-6113
Preference Erosion	-0,31	-0,97	30,80	-6855	-1862	16339

Fresh tomato could well be considered a sensitive good for EU producers as they would favour an enlargement of TRQs instead of bilateral and multilateral trade liberalisations. The removal of the entry price system will have a relatively large effect, which involves the reduction of EU sales by more than 5%. The adoption of the uniform tariff would have lesser negative impact on EU sales, as the protection is rebalanced across the year. As for ROW's exporters, they would loss with the specific phasing out of the Moroccan entry price and with the adoption of a uniform tariff. Export gains for ROW would result of the across-the board tariff reduction (Tariffication A), of a unilateral decrease in MFN effective protection and of the removal of the MFN entry price.

Monthly effects are quite variable depending on the studied scenario (see Table 16). Most of the trade impacts of the entry price and tariff liberalisations would concentrate on the period January-March (when the Spanish production is larger), and

in April (when the Dutch production emerges in the fresh tomato market). The TRQ enlargement would have only marginal effects except for March, November and December. The phasing out of MFN entry prices benefits both MFN and Moroccan suppliers, except for February, March and May, when the ROW's exports decrease because of the removal of a barrier that also constrains the relatively competitive Moroccan exports. The tariffication A and the further tariff reduction would benefit ROW exports during all the year. A uniform tariff would instead hamper both ROW and Morocco's exports in the last part of the year, because this would imply larger tariffs for the period between August to December.

Percentage price changes with respect to the benchmark scenario (Table 15) are dramatic in the scenarios of multilateral and bilateral liberalisation of entry prices and tariffs, in particular, for the first four months of the year. EU internal prices could decrease by almost 20% in the scenario of MFN entry price elimination (January), and would also imply a two-digit reduction in February and April. In this last month, trade liberalisation appears especially important for Moroccan exporters, who could see their export price increased by 20% in the scenario of "Agreed entry price" elimination. Moroccan exporters are less sensitive in the scenario of preference erosion and only would increase their price marginally in the scenario of enlarged TRQs, except for March.

Table 14. Impacts of trade liberalisation on fresh tomato market (2004)

Percentage and absolute import changes

Scenario TRQ	Percentage (%)			Quantities (tonnes)		
	EU	MO	ROW	EU	MO	ROW
January	-0,44	5,63	-1,03	-874	1879	-71
February	0,00	0,00	0,00	0	0	0
March	-2,64	34,14	-6,06	-5120	11460	-430
April	-0,22	5,25	-0,51	-410	833	-20
May	0,00	0,00	0,00	0	0	0
June	0,00	0,00	0,00	0	0	0
July	0,00	0,00	0,00	0	0	0
August	0,00	0,00	0,00	0	0	0
September	0,00	0,00	0,00	0	0	0
October	0,00	0,00	0,00	0	0	0
November	-0,85	9,94	-1,97	-1256	2710	-83
December	-0,93	9,73	-2,16	-1700	3875	-224

Scenario Agreed EP	Percentage (%)			Quantities (tonnes)		
	EU	MO	ROW	EU	MO	ROW
January	-18,35	302,21	-37,70	-36390	100904	-2621
February	-16,24	314,46	-33,87	-31158	84157	-2022
March	-8,91	125,99	-19,56	-17254	42298	-1390
April	-17,27	570,80	-35,75	-32328	90612	-1410
May	-3,70	208,10	-8,41	-7360	16560	-157
June	0,00	0,00	0,00	0	0	0
July	0,00	21,64	-0,01	-6	11	0
August	0,00	0,00	0,00	0	0	0
September	0,00	0,00	0,00	0	0	0
October	0,00	0,00	0,00	0	0	0
November	0,00	0,00	0,00	0	0	0
December	0,00	0,00	0,00	0	0	0

Scenario MFN Entry Prices	Percentage (%)			Quantities (tonnes)		
	EU	MO	ROW	EU	MO	ROW
January	-19,49	289,29	97,04	-38639	96592	6749
February	-16,24	314,46	-33,87	-31158	84157	-2022
March	-8,91	125,99	-19,56	-17254	42298	-1390
April	-17,86	559,75	62,72	-33427	88858	2473
May	-3,70	208,10	-8,41	-7360	16560	-157
June	0,00	0,00	0,00	0	0	0
July	-0,08	21,44	20,02	-141	11	258
August	0,00	0,00	0,00	0	0	0
September	0,00	0,00	0,00	0	0	0
October	0,00	0,00	0,00	0	0	0
November	0,00	0,00	0,00	0	0	0
December	0,00	0,00	0,00	0	0	0

Scenario Tariffication A	Percentage (%)			Quantities (tonnes)		
	EU	MO	ROW	EU	MO	ROW
January	-7,74	92,90	59,16	-15347	31017	4114
February	-6,11	98,83	-0,95	-11723	26450	-57
March	-4,23	52,80	3,76	-8185	17726	267
April	-5,78	138,51	51,96	-10818	21988	2049
May	-1,64	79,95	19,48	-3274	6363	364
June	-0,26	8,89	23,46	-482	221	712
July	-0,13	19,96	34,77	-236	10	448
August	-0,03	0,00	24,12	-48	0	91
September	-0,24	0,00	23,50	-416	0	805
October	-0,49	8,30	22,79	-689	332	1023
November	-0,57	4,44	13,22	-848	1210	557
December	-0,75	4,01	12,76	-1366	1598	1324

Scenario Tariffication B	Percentage (%)			Quantities (tonnes)		
	EU	MO	ROW	EU	MO	ROW
January	-17,50	260,89	53,76	-34703	87109	3739
February	-14,53	280,57	-48,89	-27866	75089	-2918
March	-7,27	106,31	-38,19	-14090	35690	-2713
April	-16,20	505,35	25,68	-30329	80222	1012
May	-3,38	191,68	-19,56	-6723	15254	-366
June	0,15	-5,73	-12,55	279	-142	-381
July	-0,02	14,23	4,73	-36	7	61
August	0,01	0,00	-12,83	27	0	-48
September	0,13	0,00	-12,58	231	0	-431
October	0,29	-5,43	-12,27	403	-217	-551
November	0,36	0,04	-25,65	535	11	-1080
December	1,61	-9,10	-23,48	2935	-3624	-2436

Scenario Preference Erosion	Percentage (%)			Quantities (tonnes)		
	EU	MO	ROW	EU	MO	ROW
January	-1,16	-2,68	86,92	-2298	-896	6045
February	-0,19	-0,43	14,26	-357	-116	851
March	-0,21	-0,49	14,20	-403	-163	1008
April	-0,66	-1,53	71,94	-1232	-243	2837
May	-0,11	-0,25	23,88	-217	-20	447
June	-0,19	-0,45	23,64	-363	-11	718
July	-0,12	-0,29	34,78	-231	0	449
August	-0,03	0,00	24,12	-48	0	91
September	-0,24	0,00	23,50	-416	0	805
October	-0,36	-0,84	23,15	-509	-34	1039
November	-0,16	-0,38	14,32	-238	-103	603
December	-0,30	-0,69	13,96	-544	-276	1448

Source: F&V trade model runs.

Table 15. Impacts of trade liberalisation on fresh tomato market (2004)

Internal and border price changes

Scenario TRQ	Internal Price			Border Price		
	EU	MO	ROW	EU	MO	ROW
January	-0,22	-1,39	-0,10	0,00	0,55	-0,10
February	0,00	0,00	0,00	0,00	0,00	0,00
March	-1,33	-7,46	-0,62	0,00	2,98	-0,62
April	-0,11	-1,17	-0,05	0,00	0,51	-0,05
May	0,00	0,00	0,00	0,00	0,00	0,00
June	0,00	0,00	0,00	0,00	0,00	0,00
July	0,00	0,00	0,00	0,00	0,00	0,00
August	0,00	0,00	0,00	0,00	0,00	0,00
September	0,00	0,00	0,00	0,00	0,00	0,00
October	0,00	0,00	0,00	0,00	0,00	0,00
November	-0,43	-2,46	-0,20	0,00	0,95	-0,20
December	-0,47	-2,48	-0,22	0,00	0,93	-0,22

Scenario Agreed EP	Internal Price			Border Price		
	EU	MO	ROW	EU	MO	ROW
January	-9,64	-34,32	-4,62	0,00	14,93	-4,62
February	-8,48	-33,53	-4,05	0,00	15,28	-4,05
March	-4,56	-20,42	-2,15	0,00	8,50	-2,15
April	-9,05	-40,15	-4,33	0,00	20,97	-4,33
May	-1,87	-22,23	-0,88	0,00	11,91	-0,88
June	0,00	0,00	0,00	0,00	0,00	0,00
July	0,00	-3,84	0,00	0,00	1,98	0,00
August	0,00	-3,84	0,00	0,00	-3,84	0,00
September	0,00	-3,84	0,00	0,00	-3,84	0,00
October	0,00	0,00	0,00	0,00	0,00	0,00
November	0,00	0,00	0,00	0,00	0,00	0,00
December	0,00	0,00	0,00	0,00	0,00	0,00

Scenario MFN Entry Prices	Internal Price			Border Price		
	EU	MO	ROW	EU	MO	ROW
January	-10,27	-34,53	-24,98	0,00	14,56	7,02
February	-8,48	-33,53	-4,05	0,00	15,28	-4,05
March	-4,56	-20,42	-2,15	0,00	8,50	-2,15
April	-9,37	-40,25	-20,95	0,00	20,76	4,99
May	-1,87	-22,23	-0,88	0,00	11,91	-0,88
June	0,00	0,00	0,00	0,00	0,00	0,00
July	-0,04	-3,86	-3,63	0,00	1,96	1,84
August	0,00	-3,86	0,00	0,00	-3,86	0,00
September	0,00	-3,86	0,00	0,00	-3,86	0,00
October	0,00	0,00	0,00	0,00	0,00	0,00
November	0,00	0,00	0,00	0,00	0,00	0,00
December	0,00	0,00	0,00	0,00	0,00	0,00

Scenario Tariffication A	Internal Price			Border Price		
	EU	MO	ROW	EU	MO	ROW
January	-3,95	-17,12	-13,87	0,00	6,79	4,76
February	-3,10	-16,61	-4,14	0,00	7,11	-0,10
March	-2,14	-10,86	-3,69	0,00	4,33	0,37
April	-2,93	-19,39	-11,78	0,00	9,08	4,27
May	-0,83	-12,11	-4,61	0,00	6,05	1,80
June	-0,13	-1,86	-4,30	0,00	0,86	2,13
July	-0,06	-3,66	-5,88	0,00	1,84	3,03
August	-0,01	-3,66	-4,25	0,00	-0,99	2,19
September	-0,12	-3,66	-4,30	0,00	-0,99	2,13
October	-0,24	-1,92	-4,35	0,00	0,80	2,07
November	-0,29	-1,26	-2,85	0,00	0,44	1,25
December	-0,38	-1,30	-2,89	0,00	0,39	1,21

Scenario Tariffication B	Internal Price			Border Price		
	EU	MO	ROW	EU	MO	ROW
January	-9,17	-32,39	-19,81	0,00	13,69	4,40
February	-7,55	-31,42	2,47	0,00	14,30	-6,49
March	-3,71	-17,94	4,43	0,00	7,51	-4,70
April	-8,46	-38,36	-15,59	0,00	19,73	2,31
May	-1,70	-21,19	1,97	0,00	11,30	-2,15
June	0,07	1,29	2,83	0,00	-0,59	-1,33
July	-0,01	-2,64	-0,93	0,00	1,34	0,46
August	0,01	-2,64	2,79	0,00	-4,45	-1,36
September	0,07	-2,64	2,82	0,00	-4,45	-1,34
October	0,14	1,33	2,86	0,00	-0,56	-1,30
November	0,18	0,25	6,38	0,00	0,00	-2,92
December	0,80	3,07	6,68	0,00	-0,95	-2,64

Scenario Preference Erosion	Internal Price			Border Price		
	EU	MO	ROW	EU	MO	ROW
January	-0,58	-0,27	-12,48	0,00	-0,27	6,46
February	-0,09	-0,04	-2,76	0,00	-0,04	1,34
March	-0,10	-0,05	-2,76	0,00	-0,05	1,34
April	-0,33	-0,15	-10,69	0,00	-0,15	5,57
May	-0,06	-0,03	-4,27	0,00	-0,03	2,16
June	-0,10	-0,05	-4,28	0,00	-0,05	2,14
July	-0,06	-0,03	-5,88	0,00	-0,03	3,03
August	-0,01	-0,03	-4,25	0,00	-0,03	2,19
September	-0,12	-0,03	-4,30	0,00	-0,03	2,13
October	-0,18	-0,08	-4,32	0,00	-0,08	2,10
November	-0,08	-0,04	-2,75	0,00	-0,04	1,35
December	-0,15	-0,07	-2,78	0,00	-0,07	1,32

8. Conclusions and further developments

We have undertaken the building up of a partial equilibrium model that would be of help to assess the impact of trade liberalisation scenarios related to Mediterranean product, in particular F&V. Recognising that the simulation tool still has some way until it becomes fully operative, the F&V trade model is already able to provide with a framework, ready to use, to assess EU trade agreements that affect selected F&V. The F&V model has been applied to fresh tomato market, in the preliminary simulations presented in this document, and it can be easily extended to other horticultural products which appear sensitive for the EU. The model's value added lies in the detailed specification of policy instruments and in the monthly differentiation of trade impacts, which vary seasonally in this kind of goods.

The first simulations have been applied to the fresh tomato market and have given preliminary information on the impact of selected scenarios of trade liberalisation. As regards to EU producers, bilateral trade liberalisation with extension of TRQs would be the least dramatic scenario. By contrast, the phasing out of the entry price system would have serious consequences on EU producers. The model has also given detailed information on Morocco's interests in the negotiation, although it could easily include a larger number of suppliers. Morocco appears to be interested in multilateral liberalisation as well as in bilateral liberalisation. In fact, multilateral liberalisation will not cause a great deal of preference erosion against Moroccan exporters, unless tariff reductions only affect MFN suppliers.

In the worst case for EU producers (entry price elimination), EU supplies would decrease by 20% in some periods of the year, although impact would be lower in the second half of the year, when current protection is smaller. Price decreases in the sensitive months (first quarter could reach 10%. However, the model is able to simulate more specific scenarios, if the project Tradeag is requested to do so.

Further developments of the model have to be addressed to improve the database, but in particular, the accuracy of the parameters used, such as the CES and the import demand and supply elasticities. The model has to get some degree of dynamics, as consumer and producer decisions in one month could affect decisions in other periods of the year. In terms of analysing the EMFTA, the fact that a number of countries are negotiating with the EU and implementing agreements at a various stages makes it difficult to model the trade effects of the Euro-Mediterranean FTAs. Furthermore, actual preference margins enjoyed by one specific third country in the EU are depending on the preferences granted to other third countries. Consequently, the results of modelling efforts can hardly be considered as forecasts of future developments. They rather reflect or simulate the size of the potential economic impacts, depending on the nature of the preferences granted.

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Annex I (from Lorca, 2000)

Morocco

TARIC	Description	Amount	Average tariff (%)	Equivalent tariff (%)	Shadow tariff (%)
07020000	Fresh or chilled tomatoes	195032	3.0	0.9	19.8
08051010	Oranges	13217	0.0	0.0	6.4
08051030	Navel, navelines…	17654	0.0	0.0	0.0
08051050	Other oranges	5031	0.0	0.0	11.8
08052010	Clementines	91281	0.0	0.0	5.6
08052030	Monreales	212	0.0	0.0	20.5
08052050	Mandarines	221	0.0	0.0	17.7
08052070	Tangerines	834	0.0	0.0	22.5
08052090	Other	19845	0.0	0.0	10.2
08053010	Lemons	74	3.0	11.7	15.2

Egypt

TARIC	Description	Amount	Average tariff (%)	Equivalent tariff (%)	Shadow tariff (%)
07020000	Fresh or chilled tomatoes	228	13.6	16.1	45.5
08051010	Oranges	-	0.0	-	21.2
08051030	Navel, navelines…	3677	0.0	0.0	6.2
08051050	Other oranges	2841	0.0	0.0	11.8
08052010	Clementines	-	0.0	-	22.4
08052030	Monreales	-	0.0	-	30.1
08052050	Mandarines	90	2.7	16.2	23.3
08052070	Tangerines	-	0.0	-	30.1
08052090	Other	255	4.2	16.7	23.2
08053010	Lemons	77	2.2	6.5	45.1

Tunisia

TARIC	Description	Amount	Average tariff (%)	Equivalent tariff (%)	**Shadow** tariff (%)
07020000	Fresh or chilled tomatoes	1034	10.2	14.5	34.3
08051010	Oranges	-	0.0	-	21.2
08051030	Navel, navelines…	20813	0.0	0.0	6.4
08051050	Other oranges	3	0.0	0.0	23.6
08052010	Clementines	-	0.0	-	22.4
08052030	Monreales	-	0.0	-	30.1
08052050	Mandarines	5	1.3	16	26.8
08052070	Tangerines	-	0.0	-	30.1
08052090	Other	-	0.0	-	26.7
08053010	Lemons	1	0.6	6.7	59.3

Turkey

TARIC	Description	Amount	Average tariff (%)	Equivalent tariff (%)	Shadow tariff (%)
07020000	Fresh or chilled tomatoes	2939	12.7	12.0	17.3
08051010	Oranges	297	7.7	0	11.9
08051030	Navel, navelines…	13216	8.9	14.5	10.8
08051050	Other oranges	590	6.8	16.4	17.5
08052010	Clementines	639	8.7	0	18.4
08052030	Monreales	25210	8.2	0	19.8
08052050	Mandarines	1523	6.8	16.3	16.5
08052070	Tangerines	17	1.3	0	26.8
08052090	Other	20.362	6.9	0	19.9
08053010	Lemons	41495	7.1	6.5	16.5