THE INFLUENCE OF THE EUROPEAN COMMUNITY'S TARIFF POLICY ON EUROPEAN ORANGE AND MANDARIN PRICES

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Introduction

Production of Mediterranean oranges and mandarins takes place during the "winter" season - from October through June. For a number of countries, most notably Spain, Israel and Morocco, production for export dominates. The bulk of international trade takes place within Europe, with the nine-member European Community (EC9) the largest importer. During the 1976/77 and 1977/78 seasons the EC9 absorbed an average of 82 percent of the mandarin exports and 56 percent of the orange exports from the Mediterranean area. Due to its dominant position in the market, trade policy in the Community is of considerable importance.

European Community Trade Policy for Oranges and Mandarins

The original Community of the Six (EC6) began to implement a common policy for fruits and vegetables in 1962. Major objectives were the stabilization of internal consumer prices and the protection of Community producers from low-cost imports. A common external tariff (CET) on oranges and mandarins from non-members was introduced and was fully operational by January 1st, 1967. However, since 1969 the Community has implemented preferential agreements on a country-by-country basis with all the major Mediterranean exporters. Such agreements permit reductions in the tariff for the country involved if its imports are not priced at an "unacceptably" low level.

On a daily basis Community duties are applied on the basis of *forfaitaire prices*. These are calculated bi-weekly by subtracting from a "representative" market price: customs duties, other import charges, internal transportation costs, a fixed profit margin between entry and wholesale levels, and a fixed amount for handling and other marketing services (European Community, 1970). A further set of prices - *reference prices* are determined each season for different varietal groups. Each group includes several varieties cultivated in the European Community, primarily in Italy. Coefficients are established to effect the necessary transformation to apply reference prices to imported varieties. Among other uses, reference prices are employed to evaluate

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whether preferential tariffs or the CET will be applied to imports. If the market price of an imported variety or group of varieties per 100 kg. multiplied by the varietal correction coefficient minus import charges (excluding tariffs) and internal transport costs is equal to or greater than the reference price plus duty (CET multiplied by the reference price) plus 1.2 units of account, then preferential arrangements operate (European Communities, 1969). This condition can be expressed through the following inequality

$$(P^m \times C) - K \geq P^r + (P^r \times CET) + 1.2 \text{ u.a.} \qquad (1)$$

where P^m = market price at the wholesale level (u.a./100 kg.)
C = varietal correction coefficient
K = EC estimated import charges (excluding tariffs) and internal transport costs
P^r = reference price (u.a./100 kg.)
CET = common external tariff

Market price (P^m) can be decomposed into the following components: the price at which the product enters the EC (entry price), duties paid, and a fixed amount to account for actual costs and margins between entry and wholesale level. On the assumption that (1) applies

$$P^m = P^e + (P^f \times T^p) + K' \qquad (2)$$

where P^e = entry price (u.a./100 kg.)
P^f = forfaitaire price (u.a./100 kg.)
T^p = preferential tariff
K' = actual costs and margins between entry and wholesale level

Substituting (2) into (1); assuming that $P^f \simeq P^e$ and $(K' \times C) \simeq K$; and re-defining P^e yields

$$P^p = \frac{P^r (1 + CET) + 1.2}{C(1 + T^p)} \qquad (3)$$

where P^p is the preference price or minimum entry price under which an exporting country continues to benefit from its preferential agreement with the Community.

The relationship in equation (1) is evaluated by the Community on a daily basis. If it fails to hold for several days then the preferential tariff is suspended and the CET is applied. The Community also calculates an entry price for imported produce daily. If this falls below the reference price then countervailing duties equal to the difference between the calculated entry price and the reference price are imposed, in addition to the CET.

The European Community's trade policy for oranges and mandarins is complex. However, as a generalization the preference price is the most important determinant of the effective size of the tariff barrier facing Mediterranean exporters. Equation (3) demonstrates that a number of factors influence the level of the preference price. In the short-run (single season) changes in the reference price and the varietal correction coefficient are important. In the long-run (several years) changes in the CET and preferential tariff can be significant.

Theoretical Implications of Community Trade Policy

From a theoretical perspective, the European Community's trade policy can have three major effects: (1) the restriction of imports of oranges and mandarins into the Community; (2) an increase in the prices of these products in the EC; and (3) a reduction of prices in other markets. The conditions under which these effects apply can be illustrated by use of graphical and algebraic analysis. Some abstraction from the complexity of actual market structure and behavior is necessary but does not invalidate the results obtained.

In figure 1 the impact of EC policy on imports and Community prices is demonstrated. The analysis relates to the generic commodity "oranges" and deals with the European Community and the Mediterranean area exporters as two market aggregates.

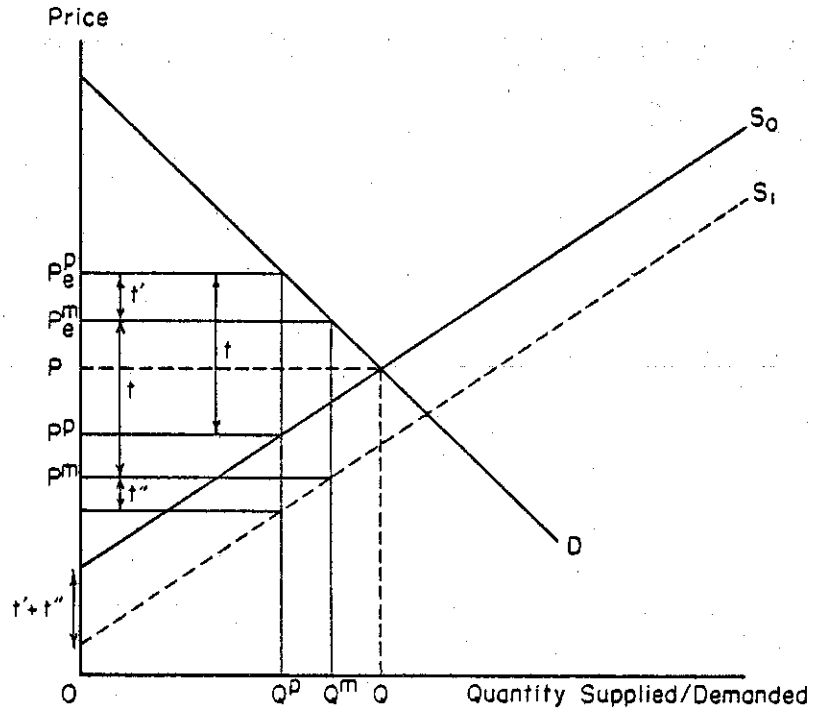
The curve S_0 denotes the supply response relationship of oranges to the EC from the Mediterranean area. The curve D is the EC's demand curve for such oranges. Ignoring transport and other costs, in the absence of trade restrictions the Community would import the quantity Q and the import and internal price would be P. Under EC policy a minimum entry price of P^p is set for imports in order to maintain an internal market price of P^p_e. Imports are reduced to Q^p. The difference between P^p_e and P^p, denoted in the diagram by the t on the right-hand side, is the Community's tariff on imports. In the situation depicted, the price P^p corresponds to the preference price discussed above and t can be considered as an "overall" preferential tariff for the Mediterranean area. For ease of exposition this will be assumed to be a specific tariff, rather than the ad valorem type actually employed.

Consider what happens if the supply of oranges from the Mediterranean area expands, thus tending to shift the curve S_0 to S_1. In this case, if the preferential tariff were to continue to be applied, imports would expand to Q^m, the entry price of imports would fall to P^m and internal EC prices would decline to P^m_e. In order to prevent such a price fall the EC suspends preferences and increases tariffs. In figure 1 the imposition of an additional tariff of t' + t" would just return the system to the desired price position, P^p_e. However, the tariff actually imposed by the Community (the CET) is sufficiently great to promote a restriction of exports by suppliers. This creates a leftward shift in the curve S_1 and a return to an equilibrium position in which preferences are restored.

In the case illustrated when downward pressure exists on Community prices due to supply pressures, the preferential tariff system serves to restrict imports and keep internal prices at a higher level than would otherwise obtain. Changes in the preference price level are thus extremely significant for importers. If supply pressure does not exist, for example in figure 1 when the supply curve lies to the left of S_0, the effect of the tariff system is less pronounced. The loss of preferences does not occur, prices are not held at the minimum levels P^p_e and P^p, and changes in the preference price level are not so significant for importers.

Since the Community is a major importer of oranges and mandarins its trade policy has important implications for prices in the rest of Europe. The nature of the effect can be demonstrated algebraically through a four equation linear model of the market for "oranges". The

Figure 1 - Impact of preference pricing on imports and EC prices.



model is composed of a Mediterranean supply equation, an EC demand equation, a "rest-of-Europe" demand equation, and a market-clearing condition. Again, for the sake of simplicity, the EC is assumed to use a specific import tariff.

$$S^m = a + bP^{eu} \qquad \text{Mediterranean Supply} \qquad (4)$$

$$D^{ec} = c - d(P^{eu} + t) \qquad \text{EC Demand} \qquad (5)$$

$$D^{re} = e - fP^{eu} \qquad \text{Rest-of-Europe Demand} \qquad (6)$$

$$S^m = D^{ec} + D^{re} \qquad \text{Market-Clearing Condition} \qquad (7)$$

where S^m = Mediterranean supply
P^{eu} = European price
D^{ec} = EC demand
t_{re} = EC tariff
D^{re} = Rest-of-Europe demand
$a...f$ = structural coefficients

Substituting (4) to (6) into (7) and solving for P^{eu}

$$P^{eu} = \frac{c - a + e - dt}{b + d + f} \qquad (8)$$

or

$$P^{eu} = \lambda_0 - \lambda_1 t \qquad (9)$$

where $\lambda_0 = \frac{c - a + e}{b + d + f}$, $\lambda_1 = \frac{d}{b + d + f}$

Differentiating (8)

$$\frac{dP^{eu}}{dt} = - \frac{d}{b + d + f} = - \lambda_1. \qquad (10)$$

Thus increases in the EC's tariff on oranges depress price in the rest of Europe and vice versa. For any given set of structural supply/demand coefficients, changes in the tariff affect this price by a constant multiple (λ_1).

An Empirical Analysis of the Effects of Community Policy on Prices

The above analysis suggests that if downward pressure on prices exists, Community tariff policy acts to keep internal prices at a higher level than would otherwise obtain and depresses those in other markets. A priori it is to be expected that such price effects will historically have been stronger in the case of oranges. Loss of tariff preferences for this commodity has been relatively common. During the period from 1969/70 to 1975/76, for example, Spain lost its preferences for oranges on a total of 262 days, while the comparable figure for mandarins was only about one third as great (Albisu, 1979).

In order to test whether Community tariff policy has had a discernible impact on prices in the long-run, linear price equations for oranges and mandarins in the Community were estimated. The equations use annual data for the old European Community of the Six (EC6) for the period 1966/67 to 1975/76. Annual data are selected since the possible long-run price effect of Community policy are of greatest consequence. The EC6 was chosen because of the need to ensure a degree of policy

continuity over the sample period.

The equations hypothesize that three factors influence market prices in the Community: total orange/mandarin exports from the Mediterranean area; the supply of a substitute commodity (pears) in the Community; and the preference price. Thus the equations are

$$\text{Oranges:} \quad P^{o} = \alpha_0 + \alpha_1 E^{o} + \alpha_2 Q^{pa} + \alpha_3 P^{op} \tag{11}$$

$$\text{Mandarins:} \quad P^{m} = \beta_0 + \beta_1 E^{m} + \beta_2 Q^{pb} + \beta_3 P^{mp} \tag{12}$$

where P^{o} = orange market price (U.S. $ per tonne)
P^{m} = mandarin market price (U.S. $ per tonne)
E^{o} = total orange exports from the Mediterranean area (thousand tonnes)
E^{m} = total mandarin exports from the Mediterranean area (thousand tonnes)
Q^{pa} = quantity of pears offered for sale in the EC from October to June (thousand tonnes)
Q^{pb} = quantity of pears offered for sale in the EC from October to March (thousand tonnes)
P^{op} = orange preference price (U.S. $ per tonne)
P^{mp} = mandarin preference price (U.S. $ per tonne)

and the expectation is that $\alpha_1, \alpha_2, \beta_1, \beta_2 < 0$; $\alpha_3 > 0$; and $\beta_3 \simeq 0$.

Wholesale auction prices in Rotterdam for Spanish varieties were used as dependent variables. An aggregate of four orange groups (navel, select white, blood orange, and verna) and an aggregate of two mandarin groups (satsuma and clementine) were employed. Monthly average prices for each group were weighted by monthly Spanish exports to all destinations to compute season average prices.

Seasonal preference prices relating to all exporters, varietal groups, and different periods during the season when preferences operate were calculated from the following general equation

$$P^{p} = \frac{\sum_{i=1}^{L}\sum_{j=1}^{M}\sum_{k=1}^{N} \frac{(P^{r}_{ijk}\,(1 + CET_{ijk}) + 1.2)}{C_{ijk}[1 + T^{p}_{ijk}]} Q_{ijk}}{\sum_{i=1}^{L}\sum_{j=1}^{M}\sum_{k=1}^{N} Q_{ijk}} \tag{13}$$

where i = exporting country (i=1, L)
j = varietal group (j=1, M)
k = time period (k=1, N)
Q = exports to the European Community

Conversion to U.S. dollars was effected by converting from units of account to florins using "green" rates and then from florins to dollars using the average 1976 exchange rate. Prices were deflated by the consumer price index for Holland (1976 = 100).

The price equations were estimated using ordinary least-squares and

Table 1 - Estimated price equations.

Variety	Constant Term	Independent Variables						
		E^0	E^m	Q^{pa}	Q^{pb}	P^{op}	P^{mp}	R^2
Oranges	1268	-.28		-.46		.73		.91
		(.03)		(.17)		(.33)		
Mandarins	1954		-1.49		-.85		-.09	.90
			(.21)		(.62)		(.49)	

Notes: Figures in parentheses are asymptotic standard errors.
R^2 is the coefficient of multiple determination.

results are presented in table 1. They demonstrate that in the case of oranges the preference price has exerted a statistically discernible impact on EC price. The coefficient on the preference price variable is of anticipated sign and has a relatively low standard error. In the mandarin equation, however, this is not the case. An equation with the preference price variable omitted would perform equally well in explaining market price formation for mandarins in the EC.

These results lend support to the hypothesis that the EC's preference price policy has had a discernible long-run impact on EC orange prices but not on mandarin prices. Expressed in terms of an elasticity at the mean of the observations, the results suggest that a 1% increase in the season average preference price would increase EC orange prices by .45%. Furthermore they permit an approximation of the effect of the system on prices in other European markets.

In equation (11) the price of oranges can be redefined as

$$P^{o} = P^{er} + t^{ec} \qquad (14)$$

where P^{er} = the price on other European markets
t^{ec} = the "tariff effect" of the preference price system upon internal prices

Furthermore, since the primary determinant of the "tariff effect" is the level of the preference price then it can be assumed that

$$t^{ec} = \alpha_3 P^{op} \qquad (15)$$

Combining (14) and (15) the price of oranges in other European markets can be estimated by

$$P^{er} = P^{o} - \alpha_3 P^{op} \qquad (16)$$

In terms of the theoretical framework developed above α_3 approximates the constant λ_1 in equations (9) and (10).

Expressed in terms of an elasticity at the mean of the observations, the empirical results and equation (16) suggest that a 1% increase in the season average preference price, defined by equation (13), would decrease the price of oranges in other European markets by .8%.

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