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ORANGE JUICE DUMPING RULING

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Introduction

The U.S. Department of Commerce (USDOC), International Trade Administration, found that Cutrale, Citrosuco (Fisher), Montecitrus and other Brazilian firms dumped orange juice (OJ) in the United States over the period from October 2003 through September 2004. This dumping contributed to a build up of Florida OJ inventories and resulted in low OJ prices.

The United States tends to have excess demand for OJ, while the rest of the world (RW) tends to have excess supply. U.S. excess demand—the difference between total U.S. demand and what the United States can supply from domestic production— is demand for imports. RW excess supply—the difference between RW supply and RW demand—is supply to fulfill the U.S. import demand. The (quantity of) excess demand increases as the price of OJ decreases and vice versa, while the (quantity of) excess supply decreases as the price decreases and vice versa. In equilibrium, price is such that U.S. excess demand equals RW excess supply.

When dumping occurs, this excess supply-demand equilibrium is disturbed. Initially, the price of OJ in the United States decreases with dumping, which, in turn, increases the quantity of U.S. excess demand. At this point U.S. excess demand would be greater than RW excess supply. This difference results in an increase in the price in the RW, freeing up supply for the U.S. market. Thus, there is a positive discrepancy between the Brazil FOB price charged to customers in the RW and the United States.

Estimates of Dumping Impact on Prices

The excess supply-demand approach described above is used here to estimate the impact of dumping on OJ prices. By definition, dumping occurs when OJ is imported into the United States below cost, resulting in more OJ in the United States and lower U.S. OJ prices than otherwise. Let p be the Brazil FOB price that reflects full cost. Let the price at which OJ is dumped be p times $(1-\lambda)$ or $p(1-\lambda)$ where λ is a dumping margin $(0< \lambda <1)$.[1] The price for OJ landed in the United States includes the tariff and transportation charges. Let this price be denoted by $p_1 = p(1-\lambda) + T$, where T stands for these tariff and transportation charges. OJ in this analysis is treated as a homogeneous commodity, and OJ produced from domestic oranges and imported OJ are assumed to receive the same price (p_1).

Let Q_1 and Q_2 be U.S. and RW OJ supply levels (production plus beginning inventory levels), respectively. Let q_1 be U.S. consumer OJ demand. Let q_2 be RW consumer OJ demand, including

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[1] The U.S. Department of Commerce dumping margin is defined with respect to the dumping price, not the full cost price p as in the present study. That is, denoting the dumping price as p_d which equals $p(1-\lambda)$ in this paper, the USDOC margin γ is defined by $p = p_d(1+\gamma)$ or $p_d = p/(1+\gamma)$. Thus, $p_d = p(1-\lambda) = p/(1+\gamma)$, implying $(1-\lambda) = 1/(1+\gamma)$ or, solving, $\lambda = \gamma/(1+\gamma)$.

demand for U.S. exports. These demands are functions of prices: $q_1 = q_1(p_1) = q_1(p(1-\lambda) + T)$; $q_2 = q_2(p)$. Let demand for ending inventories in the United States (I_1) and RW (I_2) be similarly proportional (α) to the consumer demands; i.e., $I_1(p_1) = \alpha q_1(p_1)$ and $I_2(p) = \alpha q_2(p)$. Thus total consumer and inventory demands are $(1+\alpha)q_1(p_1)$ in the United States and $(1 + \alpha)\, q_2(p)$ in the RW.

Consider changes in the above various supply and demand components as a result of a change in the dumping margin. These changes will allow estimation of the impacts of dumping on the Brazil price p and the U.S. price p_1.

Assume the United States has excess demand at the world equilibrium price or

(1) $\quad (1+\alpha)\, q_1(p(1-\lambda)+T) - Q_1 > 0.$

Equation (1) implies that the United States imports OJ.

The excess supply in the world is

(2) $\quad Q_2 - (1+\alpha)\, q_2(p) > 0.$

This excess supply defines the U.S. import supply curve, net of exports.

In equilibrium, excess demand equals excess supply or

(3) $\quad (1+\alpha)\, q_1(p(1-\lambda)+T) - Q_1 = Q_2 - (1+\alpha)\, q_2(p).$

The above relationship ignores some of the spatial equilibrium dimensions of the problem, but captures basic market forces. The price is set so this relationship holds.

If the dumping margin λ is changed in equation (3), U.S. excess demand changes upsetting the equilibrium condition. To re-establish equilibrium, the price p changes. To determine this price change, equation (3) is differentiated with respect to λ and p, holding supply fixed, i.e.,

(4) $\quad (1+\alpha)(\partial q_1/\partial p_1)(1-\lambda)dp - (1+\alpha)(\partial q_1/\partial p_1)pd\lambda = - (1+\alpha)(\partial q_2/\partial p)dp$

or, solving for dp,

(5) $\quad dp = ((\partial q_1/\partial p_1)/ (\partial q/\partial p))(pd\lambda),$

where $\partial q/\partial p = (\partial q_1/\partial p_1)(1-\lambda) + (\partial q_2/\partial p)$. Notice that the factor of proportionality $(1+\alpha)$ for U.S. and RW inventories cancels out.

Result (5) indicates the impact of the dumping margin on the Brazil price p. Given this result, the impact of the dumping margin on the U.S. price ($p_1 = p(1-\lambda) + T$) is then

(6) $dp_1 = (1-\lambda)\, dp - pd\lambda$

First, result (5) is estimated as follows. Assume the FOB Santos price is $.60 per single strength equivalent (SSE) gallon.[2] The USDOC preliminary dumping margin varies across Brazil firms ranging from .6029 to .2462. Assuming the average USDOC margin is 1/3 and this value reflects past dumping pricing, λ=1/4 in the present study.[3] Hence, the term $pd\lambda$ = ($.60)(1/4) = $.15.

In a recent study "Generic Promotions and Florida Citrus," by a Panel of Economist appointed by the Florida Citrus Commission, April 8, 2005, the U.S. consumer demand slope ($\partial q_1/\partial p_1$) was estimated at -500 million SSE gallons per dollar change in price. The same study estimated the RW demand slope ($\partial q_2/\partial p$) at -789.

Hence, the estimated impact of dumping is

(7) $dp = ((500)/((500)(1-.25) + 789))\ (.60)(.25) = \$.06$/SSE gallon.

That is, dumping in the United States tends to increase the Brazil price p paid in the RW by $.06/SSE gallon. Less OJ sold in the RW fetches a higher price.

On the other hand, the dumped OJ in the United States decreases the U.S. price p_1. Based on equation (6) and result (7), the decrease in the U.S. price is

(8) $dp_1 = (1-.25)\ (.06) - (.60)(.25) = -.105$.

That is, dumping tends to decrease the U.S. price by an estimated $.105/SSE gallon.

The above estimates provide an indication of the price tendency caused by dumping. The present ruling is intended to eliminate this tendency. That is, λ is zero with the imposed penalties.

Going Forward

The USDOC ruling imposes dumping margins that vary across Brazil firms, ranging from .6029 to .2462. These margins are applied to the FOB Brazil price but are not additional tariff charges to the extent the Brazil firms get the money back. The USDOC ruling requires that a Brazil firm exporting OJ product to the United States must deposit with U.S. Customs an amount equal to the margin imposed on that firm times the FOB value of the firm's exported product. This money is to be held by U.S. Customs for about a year, while that firm's price and cost records associated with the exports are checked to determine whether dumping has occurred over the period. If

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[2] The assumed FOB Santos price is a rough guess; it would be consistent with a U.S. FOB price of about $1.00/SSE gallon, given the FCOJ tariff of $.297/SSE gallon and a transportation charge of about $.10/SSE gallon.

[3] Based on footnote 1, $\lambda = \gamma/(1+\gamma) = (1/3)/(1+1/3)=1/4$.

USDOC finds dumping has occurred, the firm loses the deposit. If dumping does not occur the firm gets back the deposit including interest. The interest rate provided may, however, be less than the internal rate of return that the Brazil firm may be able to earn. Additionally, the Brazil firm must pay legal fees and has a risk of losing the deposit due to an unfavorable legal decision.

Estimates of Price Impacts of the Dumping Deposit

Again, let p be the Brazil FOB price. Let λ now be the percentage of price p that must be deposited with the U.S. government. That is, λp is kept in a deposit for a year and then returned (if no dumping) along with interest. Let the interest rate that the Government provides be r_0. Let the internal discount rate for Brazilian firms be r_1. This latter rate is assumed to reflect both investment opportunities and the risk of losing the deposit. Assume $r_1 > r_0$, and let $r = r_1 - r_0$ be the net discount rate. Without a dumping deposit, the price for OJ landed in the United States including tariff and transportation charges is $p_1 = p + T$ where T is again the U.S. per unit tariff and transportation costs. With the dumping deposit, the U.S. price is $p_1 = p(1+\lambda) - \lambda p/(1+r) + T$. Initially, a Brazil firm pays to the U.S. Government the tariff and transportation charge T plus the amount λp, but get backs the amount λp one year later. The present value of this latter amount is $\lambda p/(1+r)$.

Note that the above U.S. price $p_1 = p(1+\lambda) - \lambda p/(1+r) + T$ can be written somewhat more simply as

(9) $\quad p_1 = p(1+ r(1+\lambda))/(1+r) + T.$

Again, let Q_1 and Q_2 be U.S. and RW OJ supply levels (production plus beginning inventory levels), respectively. Let q_1 be U.S. consumer OJ demand. Let q_2 be RW consumer OJ demand, including demand for U.S. exports. These demands are functions of prices: $q_1 = q_1(p_1) = q_1(p(1+ r(1+\lambda))/(1+r) + T)$; $q_2 = q_2(p)$. Let demand for ending inventories in the United States (I_1) and RW (I_2) be similarly proportional (α) to the consumer demands; i.e., $I_1(p_1) = \alpha q_1(p_1)$ and $I_2(p) = \alpha q_2(p)$. Thus total consumer and inventory demands are $(1+\alpha)q_1(p_1)$ in the United States and $(1 + \alpha)\, q_2(p)$ in the RW.

Consider changes in the above supply and demand components as a result of a change in the dumping deposit term λ. These changes will allow estimation of the impacts of dumping deposit on the Brazil price p and the U.S. price p_1.

Assume the United States has excess demand at the world equilibrium price p or

(10) $\quad (1+\alpha)\, q_1(p(1+ r(1+\lambda))/(1+r) + T) - Q_1 > 0.$

Again, equation (10) implies that the United States imports OJ.

The excess supply in the world is

(11) $\quad Q_2 - (1+\alpha)\, q_2(p) > 0.$

Again, this excess supply defines the U.S. import supply curve, net of exports.

In equilibrium, excess demand equals excess supply or

(12) $(1+\alpha)\, q_1(p(1+ r(1+\lambda))/(1+r) + T) - Q_1 = Q_2 - (1+\alpha)\, q_2(p)$.

The price p is set so this relationship holds.

If the dumping deposit term λ is changed in equation (12), U.S. excess demand changes upsetting the equilibrium condition. To re-establish equilibrium, the price p changes. To determine this price change, equation (12) is differentiated with respect to λ and p, holding supply fixed, i.e.,

(13) $(1+\alpha)(\partial q_1/\partial p_1)\,((1+ r(1+\lambda)dp + prd\lambda)/(1+r)) = -(1+\alpha)(\partial q_2/\partial p)dp$

or, solving for dp,

(14) $dp = -(prd\lambda/(1+r))\,(\partial q_1/\partial p_1)/(\partial q/\partial p)$,

where $\partial q/\partial p = (\partial q_1/\partial p_1)(1+r(1+\lambda))/(1+r) + \partial q_2/\partial p$. Again, note that the factor of proportionality $(1+\alpha)$ for U.S. and RW inventories cancels out.

Result (14) indicates the impact of the dumping deposit on the Brazil price p. Given this result, the impact of the dumping deposit on the U.S. price ($p_1 = p(1+ r(1+\lambda))/(1+r) + T$) is

(15) $dp_1 = (1+r(1+\lambda))/(1+r)dp + (pr/(1+r))d\lambda$.

Note that when the net discount rate r is zero (the U.S. interest rate equals the Brazil discount rate), there is no impact of the dumping deposit on the Brazil and U.S. prices. In general, when $r > 0$, there is some impact, although possibly small.

Assume the following

p = \$1.40/ps	(Brazil price)
r = .05	(net discount rate)
λ = .20	(dumping deposit average across imports)
$d\lambda$= .20	(change from λ= 0 to λ= .20)
$(\partial q_1/\partial p_1)$ = -500	(U.S. consumer demand slope as discussed above)
$(\partial q_2/\partial p)$ = -789	(RW demand slope as discussed above).

In equation (14), the term $\partial q/\partial p = (\partial q_1/\partial p_1)(1+r(1+\lambda))/(1+r) + (\partial q_2/\partial p$ is -500*(1+(.05)(1.20))/1.05 -789 = -1293.8.

The term $(\partial q_1/\partial p_1)/(\partial q/\partial p)$ in equation (14) is -500/(-1293.8) = .386.

Thus, equation (14), which shows the impact of the U.S. dumping deposit on the Brazil price, is evaluated as

(16) $dp = - ((1.40)(.05)(.20)/(1.05))\ (.38) = \$-.005/ps.$

Equation (15), which shows the impact of the U.S. dumping deposit on the U.S. price , is evaluated at

(17) $dp_1 = ((1 + (.05)(1.20))/1.05)(-.005) + ((1.40)(.05)/(1.05))(.20) = \$.008/ps.$

That is, the dumping deposit is estimated to result in about ½ cent/ps decline in the Brazil price and 8/10 cent /ps increase in the U.S. price. This results involves a small diversion of OJ from the U.S. to the ROW due to the relatively small negative impact of the dumping deposit in conjunction with the net discount rate on Brazil's returns. Again, if the net discount rate were zero, there would be no impact on prices.

How sensitive are the price impacts to the net discount rate assumption? If the net discount rate r were cut in half (.025), the Brazil price is estimated to decline by $.003/ps, while the U.S. price is estimated to increase by $.004/ps. Alternatively, if r were doubled (.10), the Brazil price is estimated to decline by $.01/ps, while the U.S. price is estimated to increase by $.016/ps. respectively.

The legal and administrative costs for Brazil, as well as the U.S. Government, are considered as lump sum costs which do not varying with the OJ import volume, and as such are not expected to impact marginal relationships and prices in the short run. These costs do, however, impact the profit of the firms involves, and may have some longer run implications. Lower profits may result in less invested in groves and trees and impact long run supplies.

Conclusions

In recent years, dumping contributed to a build up of Florida OJ inventories and reduced Florida OJ prices by an estimated $.10/ps during that period. To remedy this situation, the U.S. government imposed dumping charges on a number of Brazilian firms in 2005. The amounts collected are kept in a deposit. The Government monitors the situation and provided a firm is not found to be dumping, its deposit is returned along with interest after one year. There are, however, some costs associated with this scheme that may impact the OJ price situation. The Brazil firms may be able to earn a higher rate on their earnings than provided by the interest that the U.S. Government pays. Additionally, Brazil firms, as well as the U.S. Government, have administrative and legal costs. The risk of losing the deposit to an unfavorable legal ruling may also be a factor. The possible higher rates that Brazil firms may earn including a risk factor are estimated to result in relatively small impacts on prices—near or less than 1cent/ps. The Brazil FOB price would decrease

slightly with a relatively small amount of OJ diverted from the U.S. to the rest of the world, while the U.S. price would increase slightly with a smaller amount of OJ in the U.S. after the diversion. The administrative and legal costs do not change marginal costs and are not expected to impact short-run prices but do impact the profits of the companies involved, and could possibly impact long-run supply negatively to the extent lower profits reduce investments in groves and trees made by these companies.

Disclaimer: The proceeding analysis assumes that at current prices (the Brazil FOB price around $1.40/ps) dumping is not occurring and the only direct cost to the 'dumpers' of the anti-dumping order is the net discount rate on the dumping margin that is held by the US government for one year during investigation. Other costs are considered (legal fees, risk factors) but not quantified. The relatively small impact to Florida prices hinges on the assumptions that Brazil's price is about $1.40, and that price is above their costs. The future situation with respect to this assumption may not be the same. Brazilian prices may not remain around $1.40 (e.g., prices may decline as a result of larger than expected crops from Brazil and/or other countries; or higher prices may result in a larger-than-expected decrease in the quantity demanded, particularly in Europe, and may not hold), or $1.40 may not cover Brazilian costs of production (i.e., fruit prices and/or costs of disease control rise rapidly). If these assumptions are not accurate the results of this analysis would not be accurate.