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Analysis of USA–European Community oilseeds agreements

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Abstract

In 1986, the American Soybean Association filed a Section 301 petition under the Trade Act of 1974, alleging that European Community oilseed subsidies nullified and impaired benefits of previous trade concessions, specifically the tariff binding of 1962. Two bilateral trade agreements were negotiated to remedy the dispute, the Blair House Agreement and the Memorandum of Understanding on Oilseeds. The impacts of these trade agreements were simulated using a three-region trade model. Results indicated that neither supply constraints nor penalties for overproduction will contribute to a recovery of USA soybean exports to the EC.

En 1986, la Société Américaine de Soya avait envoyé une petition de la Section 301 d'Accord de Commerce de 1974, alléguant que les subventions pour les graines d'huile de la Communauté Européenne avait empéche de faire des bénéfices sur les anciennes concessions commerciales, surtout le tarif limitant de 1962. Deux accords bilatéraux avaient été négociés pour arranger la dispute, l'Agreement du Blair House et le Memorandum sur la Compréhension des graines d'huile. Les effets de ces accords ont été simulés en utilisant un modéle commercial de trois regions. Les resultats indiquent que ni les contraintes d'offre, ni les penalités de surplus de production aideront a la récupération des exportations américaines vers la Communauté Europeenne.

1. Introduction

In 1962, the USA negotiated a zero-level tariff binding on oilseeds, oilseed products and non-grain feed ingredients imported into the European Community (McCalla and Josling, 1985, p. 81). In the 1970s and early-1980s the USA enjoyed dominant market share for oilseeds in the EC as the demand for protein feeds grew along with growth in the livestock sector. Total EC soybean imports increased from around six million tons in the early 1970s to over 14 million in 1986. USA exports of soybeans to the EC peaked at 11.3 million tons in 1982 and then declined to a low of 5.8 million tons in 1985. Other exporters such as Brazil, Argentina and Paraguay supplied much of the growth in EC import demand (Uri and Hyberg, 1994, p. 145). Overall, the USA market share of total EC utilization fell from an average of 84.3% in 1978–1982, to 49% in 1988–1994 (Table 1).

During this same period, real price supports for EC oilseeds increased steadily and producers responded by increasing production dramatically (Table 2). The loss in the volume, value and market share of USA oilseeds exports to the EC prompted the American Soybean Association (ASA) to file a Section 301 complaint against the EC in December 1987. Section 301 of the USA Trade Act of 1974 is the chief policy mechanism for confronting alleged unfair trading practices of USA trading partners. Section 301 of the Trade Act of 1974 authorizes the President to take appropriate actio, including retaliation, to end unfair trading practices of USA partners

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Table 1
USA market share of EC soybean utilization, 1967–1994 [a]

Year	Total EC imports	USA exports to EC	ROW exports to EC	USA exports as % of EC imports	EC utilization	USA exports as % of EC utilization	EC soybean production	EC production as % of EC utilization
1967	3624000	3296723	327277	91.0	3585000	92.0	0	0.0
1968	3976000	3232004	743996	81.3	4019000	80.4	0	0.0
1969	5690000	3359323	2330677	59.0	5651000	59.4	0	0.0
1970	5789000	4700126	1088874	81.2	5706000	82.4	0	0.0
1971	6532000	5167004	1364996	79.1	6582000	78.5	0	0.0
1972	7117000	5264430	1852570	74.0	7002000	75.2	0	0.0
1973	9111000	6046239	3064761	66.4	9086000	66.5	5	0.0
1974	8254000	6407893	1846107	77.6	8116000	79.0	4000	0.0
1975	9267000	5763134	3503866	62.2	9133000	63.1	2000	0.0
1976	9198000	7253043	1944957	78.9	9090000	79.8	2000	0.0
1977	11208000	7556354	3651646	67.4	10833000	69.8	4000	0.0
1978	12164000	9302227	2861773	76.5	11943000	77.9	4000	0.0
1979	12895000	8442807	4452193	65.5	12451000	67.8	16000	0.1
1980	10177000	9823616	353384	96.5	10364000	94.8	14000	0.1
1981	12355000	9917363	2437637	80.3	11985000	82.7	27000	0.2
1982	11850000	11316863	533137	95.5	11533000	98.1	25000	0.2
1983	9480000	8531278	948722	90.0	9623000	88.7	87000	0.9
1984	9925000	6618246	3306754	66.7	9809000	67.5	141000	1.4
1985	10158000	5786949	4371051	57.0	10398000	55.7	332000	3.2
1986	14422000	9811899	4610101	68.0	14963000	65.6	896000	6.0
1987	13319000	10114310	3204690	75.9	14645000	69.1	1785000	12.2
1988	11137000	7599342	3537658	68.2	12806000	59.3	1561000	12.2
1989	13254000	6375587	6878413	48.1	14944000	42.7	1982000	13.3
1990	12812000	6372644	6439356	49.7	14329000	44.5	2068000	14.4
1991	13784000	6594138	7189862	47.8	14750000	44.7	1509000	10.2
1992	14806000	8311000	6495000	56.1	15683000	53.0	1182000	7.5
1993	12982000	8311200	4070800	64.0	13875000	60.0	682000	4.9
1994	15176000	6410500	8765000	57.8	15713000	40.8	926000	5.9

[a] Quantities in metric tons; data for 1994 are preliminary.
Note: export/import and utilization statistics do not account for Spain and Portugal until 1986.
Source: ERS/USDA and FAS/USDA, 1989a, 1990, 1993a,b, 1994.

Table 2
EC oilseed production, 1967–1994

Year	EC rapeseed production (000s metric tons)	EC sunflower seed production (000s metric tons)	EC soybean production (000s metric tons)	EC oilseed production (000s metric tons)	Share of total production		
					Rapeseed percent	Sunflower seed percent	Soybean percent
1967	611.00	22.59	0.00	633.59	96.4	3.6	0.0
1968	689.00	25.70	0.00	714.70	96.4	3.6	0.0
1969	726.00	31.20	0.00	757.20	95.9	4.1	0.0
1970	831.00	51.79	0.00	882.79	94.1	5.9	0.0
1971	991.00	88.99	0.00	1079.99	91.8	8.2	0.0
1972	1073.00	83.00	0.00	1156.00	92.8	7.2	0.0
1973	1030.00	99.00	5.00	1134.00	90.8	8.7	0.4
1974	1174.00	95.00	4.00	1273.00	92.2	7.5	0.3
1975	907.00	147.00	2.00	1056.00	85.9	13.9	0.2
1976	986.00	114.00	2.00	1102.00	89.5	10.3	0.2
1977	921.00	122.00	4.00	1047.00	88.0	11.7	0.4
1978	1173.00	120.00	4.00	1297.00	90.4	9.3	0.3
1979	1201.00	216.00	16.00	1433.00	83.8	15.1	1.1
1980	2039.00	289.00	14.00	2342.00	87.1	12.3	0.6
1981	2010.00	488.00	27.00	2525.00	79.6	19.3	1.1
1982	2645.00	749.00	25.00	3419.00	77.4	21.9	0.7
1983	2437.00	979.00	87.00	3503.00	69.6	27.9	2.5
1984	3428.00	1170.00	141.00	4739.00	72.3	24.7	3.0
1985	3635.00	1735.00	332.00	5702.00	63.7	30.4	5.8
1986	3689.00	3278.00	896.00	7863.00	46.9	41.7	11.4
1987	5952.00	3933.00	1785.00	11670.00	51.0	33.7	15.3
1988	5191.00	3876.00	1561.00	10628.00	48.8	36.5	14.7
1989	4912.00	3540.00	1982.00	10434.00	47.1	33.9	19.0
1990	5781.00	4264.00	2068.00	12113.00	47.7	35.2	17.1
1991	7343.00	3973.00	1509.00	12825.00	57.3	31.0	11.8
1992	6058.00	3982.00	1182.00	11222.00	54.0	35.5	10.5
1993	5890.00	3408.00	682.00	9980.00	59.0	34.1	6.8
1994	6594.00	3969.00	926.00	11489.00	57.4	34.5	8.1

Sources: Statistics of the European Community, 1960–1985; United States Department of Agriculture, Economic Research Service, International Agriculture and Trade Reports, Situation and Outlook Series: Europe, various issues, 1989a–1994.

(Tweeten, 1992, p. 255). In January 1988, the USA Government agreed to investigate the charges against the EC and to bring the dispute to the GATT.

In February 1988, the EC Summit in Brussels approved two new agricultural reforms. A system of agricultural budget stabilizers was the first set of policy reforms aimed at reducing the cost of agricultural support and the burden of disposing of surplus production. The second was a program of payments for the set-aside of arable land, also targeted to reduce growth in crop production (USDA, 1989b, p. 13). The new oilseed stabilizer took effect with the 1988/1989 marketing year. Production thresholds, or maximum guaranteed quantities (MGQ) were established for oilseeds output. Penalties were defined for exceeding the trigger quantities. However, the oilseed stabilizers had mixed success in restraining the growth of output and budget expenditures; production continued beyond the established threshold levels.

In December 1989, the GATT Oilseeds Panel ruled that the EC oilseeds policy had nullified and impaired benefits of trade concessions granted in the 1960s. The EC agreed to modify its oilseeds policy during implementation of the Uruguay Round of Multilateral Trade Negotiations (MTN). However, the Uruguay Round of negotiations broke down in December 1991.

In January 1992, the USA requested another GATT panel to determine whether the EC's new policy, approved in December 1991, implemented the first GATT panel's findings. The second GATT panel ruled that the EC's new policy continued to impair the duty-free tariff binding (1962) and directed the EC to eliminate the impairment, either by modifying its policy or the trade concessions granted earlier. The EC refused and the USA announced its intention to impose retaliatory tariffs of $1 billion on imports from the Community, equal to the alleged damages incurred by USA soybean producers. A trade conflict ensued between the USA and the EC.

Subsequently, during the Uruguay Round of MTN, two bilateral trade agreements were negotiated to remedy the oilseeds dispute. These agreements, the Blair House Agreement (BHA) and the 1992 Memorandum of Understanding on Oilseeds (MOU), addressed the oilseeds trade dispute. Thus, a combination of EC policy reforms and trade agreements became the basis for resolution of the USA–EC oilseeds trade dispute.

2. Objectives

The objective of this paper is to analyze the effects of the oilseed agreements, negotiated between the USA and the EC under the Uruguay Round of MTN, on oilseeds production, prices and trade. Specific objectives are: (1) to analyze the EC's price support system for oilseeds and the resulting producers' supply response; (2) to estimate the change in EC oilseed supplies under the new Common Agricultural Policy reform programs; (3) to simulate the impact of EC policy changes on oilseeds trade under different policy scenarios.

3. The USA–EC oilseeds dispute in a historical perspective

The USA–EC oilseeds dispute should be viewed in the broad historical context of world trade relationships since the formation of the Common Agricultural Policy, the evolution of USA trade policy, and the Uruguay Round of MTN. When the oilseeds dispute is viewed in this longer term perspective, it illustrates why the resolution of the dispute played a key role in the conclusion of the Uruguay Round of MTN under the auspices of the GATT.

While the USA was in favor of European integration in the 1950s and early 1960s, it has never really accepted the creation of the customs union and the subsequent principles of the Common Agricultural Policy (Guyomard et al., 1994, p. 167). The Community's price supports for grains and livestock products stimulated domestic production. The variable levy-export restitution system provided the EC border protection against cheaper imports and a surplus disposal mechanism. Ultimately, the Community's high price supports and protection for agriculture led to reduced outlets for USA grain exports and direct competition for third country markets by the early 1980s.

The oilseeds sector represents a small but important crack in the protective framework surrounding Community agriculture. "The EC conceded a bound zero tariff on oilseed products in the XXIV-6 Negotiation, on corn germ meal in 1962, and on corn gluten feed in the Kennedy Round in 1967" (Guyomard et al., 1994, p. 167). The lack of border protection on oilseeds and products, primarily soybean meal at 44% protein and corn gluten feed at 22% protein, provided European feed compounders access to lower cost protein sources for feed rations than from more expensive Community wheat, barley and maize. A concentrate derived from soybean meal and a starchy product such as manioc, imported into the EC mainly from Thailand, can serve as a perfect substitute for cereals (Koester and Terwitte, 1988, p. 3/16; see also Surry and Moschini, 1984; Leuck, 1985).

The European Community's oilseeds price supports received stimulus from several sources in the early 1970s. High world oilseed prices in 1972–1974 and the temporary USA oilseeds embargo in 1973 sparked EC interest in oilseeds production, primarily rapeseed, sunflowers, and soybeans. Oilseed price supports and a crushing subsidy stimulated domestic production and utilization. The EC's budgetary expenditures for oilseed crops and beans, peas and lupins for animal feed increased dramatically. By 1985 the budgetary expenditure on oilseeds and protein crops exceeded 10% of the EC's total annual spending on agriculture (Koester and Terwitte, 1988,

p. 3/21). The disharmony in the protein sector was obvious. EC self-sufficiency in protein sources increased from 4% in 1973, at the beginning of the 'protein crisis', to about 10% in the mid-1980s. Imports still constituted the primary source of high-protein feed ingredients but the source of EC imports shifted owing to competitive market forces.

In the 1980s, the USA faced strong competition from Brazil, Argentina and Paraguay for the European oilseeds market. Between 1980 and 1990, USA oilseeds exports to the Community dropped by nearly 50% while EC imports from Argentina, Brazil, and Paraguay increased by 80% (Anania et al., 1994, p. 24). By 1990, Brazil became the dominant supplier of soybean meal in the EC while the USA market share for meal fell to nearly zero. Uri and Hyberg (Uri and Hyberg, 1994, p. 145) concluded that gains in world oilseeds markets by South American producers have been almost completely at the expense of USA soybean exports.

The ASA, in reaction to the loss of market share, filed a Section 301 petition in 1987, under the Trade Act of 1974 alleging that the EC's oilseeds support policies discriminated against imports of USA soybeans. Changes in USA trade law have made it easier for American firms to file Section 301 petitions and the number of petitions has increased dramatically (Salvatore, 1993, p. 317).

Since retaliation is embedded in USA trade law, the Administration threatened to use countervailing duties when the findings of the GATT panel were not immediately implemented. Guth and Pankopf (Guth and Pankopf, 1994, p.254) accuse the USA of flagrant unilateralism in the oilseeds case. Salvatore (Salvatore, 1993, p. 319) has cited extensive econometric research on USA trade laws which indicates that more trade-remedy petitions are filed during recessions, periods of an overvalued dollar, and during negotiations over market access for USA goods and services. The oilseeds case is consistent with the general trend in increased trade remedy petitions: the USA was in a recession during the early 1980s, the dollar appreciated against major European currencies through 1986, and market access was a primary component of the USA position in the Uruguay Round of MTN.

The oilseeds dispute became tightly intertwined with the proposals for tariffication and rebalancing in USA–EC trade negotiations during the GATT negotiations. "Rebalancing implies trading tariffs on feed imports for a decrease in the support provided to grain and oilseeds in the EC" (Mahé and Roe, 1991, p. 80). The USA has never been willing to consider rebalancing as a possible concession or basis for negotiation (Guyomard et al., 1994, p. 170). Nevertheless, the EC has regularly included rebalancing in its trade proposals.

Gleckler and Tweeten (Gleckler and Tweeten, 1990) simulated rebalancing oilseed and grain price supports and protection in the EC using a nine region, nine commodity SWOPSIM model. They simulated different levels of uniform support for EC cereals and oilseeds until the gains to USA grain producers offset losses to USA oilseed producers, leaving aggregate producer surplus nearly unchanged. Using a base year of 1989, USA producer welfare changes are about equal between grains and oilseeds at uniform EC support levels of 120% of world prices for grains and oilseeds. However, rebalancing left EC grain and oilseeds producers worse off because of the reduction in cereal price supports and the oilseeds crushing subsidy (Gleckler and Tweeten, 1990, p. 15).

Two significant political economy problems arise with the rebalancing scenario. Since EC producer incomes would fall, they would demand compensation — decoupled direct payments and other related adjustment assistance. In the USA, the redistribution of income between grain and oilseeds producers would entail potentially divisive political and economic problems. Thus, rebalancing was not an acceptable trade proposal for the USA during the Uruguay Round of MTN, given the well-organized agricultural lobbies on both sides of the dispute. Finally, a compromise was worked out during Blair House and subsequent negotiations leading to the final GATT agreement reached on 15 December 1993, in Geneva (for a comprehensive analysis of the final agreement see Anania et al., 1994).

4. Analysis of pre-1992 EC oilseed prices and policies

The pre-1992 oilseeds policy is the focus of this analysis because it is the basis of the ASA's Section

301 petition to the International Trade Commission, the USA's subsequent petition to the GATT, and the EC's oilseed supply situation prior to the conclusion of the Uruguay Round of MTN.

Until 1992, EC oilseed producers received price supports through a system of payments made to processors, or crushing subsidies, intended to compensate crushers for the high price of domestically produced oilseeds. The producer support price for rapeseed and sunflower seed was the intervention price (analogous to the CCC loan rate in the USA price support system). Soybean buyers were required to demonstrate that they had paid EC farmers at least the minimum support price in order to receive the crushing subsidy.

Since the EC is a net oilseeds importer, the pre-1992 oilseeds policy utilized the crushing subsidies to encourage processors to buy and process higher priced domestic oilseeds rather than lower cost imports. The USA protested the EC's price support policy in its GATT petition. The GATT panel found that the EC's oilseeds policy "(1) discriminated against imported oilseeds and (2) impaired the zero-tariff concessions on oilseeds granted by the EC in the Dillion Round of multilateral trade negotiations in the early 1960s" (USDA, 1992, p. 61). In 1992, the EC subsequently replaced the crushing subsidy support system with a new policy that links the support for oilseeds to a formula designed to make the returns from cereals and oilseeds approximately equal.

The empirical analysis of EC-10 oilseed policies is composed of two major parts. The first analysis examines oilseed prices and policies for the period leading up to the CAP reforms, the Blair House Agreement, and the Memorandum of Understanding. Simple regressions using data for the period 1968–1992 were estimated to analyze the relationship between EC-10 oilseed cost of production and policy price supports, and to estimate the responsiveness of oilseed plantings to support prices. The second empirical section uses a simulation model to estimate production and trade impacts of the CAP reforms, BHA, and MOU in the post-1992 period.

Since the mid-1960s, European oilseed producers have responded predictably to higher support prices. Steady increases in EC subsidies and oilseed yields combined to increase nominal producer revenue and oilseeds production. This increase in domestic EC production became the alleged source of the loss of market share for USA oilseeds in the European market according to the ASA's Section 301 Trade Petition. An analysis of the EC price support system from 1967 to 1992 may explain the European producer's supply response, and the resulting trade dispute.

The large increases in EC-10 oilseed prices and harvested area during the 1970s and 1980s can be observed in Fig. 1 and Fig. 2 which show, respectively, indices of EC-10 intervention prices and harvested area for rapeseed, sunflower, and soybeans over the period 1969–1992. For all three commodities, the index of support prices is the product of the intervention price in ECUs and an area-weighted average of the green exchange rates for EC-10 countries producing oilseeds. The indices are plotted relative to the lagged oilseed cost-of-production index (LCPI) for the EC-10 in Fig. 1.

In order to evaluate the formation of oilseed intervention prices before and after the 1988 budget reforms, regression analyses were performed for three commodities: rapeseed, sunflower seed, and soybeans. One general hypothesis was that, prior to the budget reforms, the agricultural lobby was successful in securing increases in intervention prices in response to increases in production costs. It was also hypothesized that the linkages between intervention prices and production costs were weakened after the budget reforms, and that changes in intervention prices then became dependent on production levels relative to maximum guaranteed quantities (MGQs).

The equation estimated for each crop was

$$\mathrm{PI}_{it} = \alpha_i + \beta_{1i}\mathrm{LCPI}_{i,t-1} + \beta_{2i}D_1\mathrm{LCPI}_{i,t-1} + \beta_{3i}\mathrm{EXCESS}_{it} + \epsilon_{it} \quad (1)$$

where PI_{it} is the index of the weighted intervention price for crop i in year t or the guide price in the case of soybeans, $\mathrm{LCPI}_{i,t-1}$ is the oilseed cost-of-production index lagged one year, D_1 is a dummy variable with values of one for the years 1968–1974 and zero for later years, EXCESS_{it} is the percentage by which production exceeded the maximum guaranteed quantities for commodity i in years 1988–1992, α_i, β_{1i}, β_{2i} and β_{3i}, are estimated parameters, and ϵ_{it} is the error term. An interaction term between the

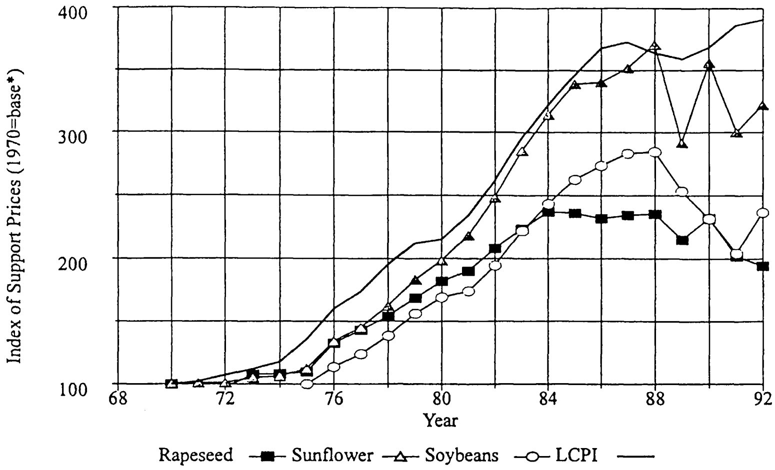

Fig. 1. EC oilseed supported price and lagged cost-of-production indices, EC-10, 1969–1992 (* soybeans 1975 base).

cost of production index and a dummy variable for 1968–1974 was included because the stability of prices observed in this period was uncharacteristic of the rest of the data period (Fig. 1). The soybean equation includes data only for years 1975–1992 because of insignificant EC-10 soybean production before 1975.

Since MGQs were the result of CAP reforms beginning in 1988, the value of the EXCESS variable is zero for all years prior to 1988. Plots of residuals of OLS regressions for all commodities revealed increasing heteroskedasticity over time, and maximum likelihood models assuming time-dependent heteroskedasticity were subsequently used and are reported here.

Results for the estimation of Eq. (1) for rapeseed, sunflowers, and soybeans are presented in Table 3. The results for rapeseed indicate that a unit increase in the oilseed cost-of-production index was associated with a 0.84 increase in the intervention price index. Elasticities calculated at mean values of the indices differed between the early (1968–1974) and late (1975–1992) time periods. Intervention prices increased an estimated 0.47% and 0.76%, in the

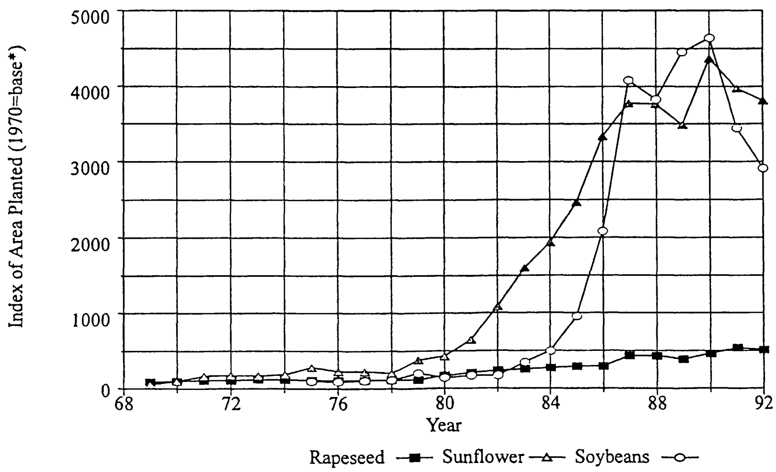

Fig. 2. Area response index for selected oilseeds, EC-10, 1969–1992 (* soybeans 1975 base).

Table 3
EC oilseeds support price and lagged cost of production indices, 1968–1992

Variables		Coefficients		
		Rapeseed [a]	Sunflower	Soybeans
Constant		23.068 ** (5.63)	−10.037 ** (−4.47)	−3.835 ** (2.75)
LCPI		0.843 ** (15.05)	1.163 ** (37.91)	1.074 ** (56.41)
D_1 LCPI		−0.127 (−1.35)	0.223 ** (4.12)	N/A
EXCESS		−0.545 ** (−3.38)	−0.326 * (−2.99)	−0.421 * (−2.07)
Goodness of fit [b]		0.945	0.980	0.898
Data period		1968–1992	1968–1992	1975–1992
Average intervention price elasticities with respect to lagged cost of production index [c]				
LCPI	1968–1974	0.47	1.34	N/A
LCPI	1975–1992	0.76	1.17	1.11

*, Significant at the 5% level of probability; **, significant at the 1% level of probability.
[a] *t*-values in parentheses.
[b] Squared correlation between observed and predicted values of dependent variable.
[c] Elasticities calculated at mean values of variables for specified data period.

early and late periods, respectively, in response to a 1% increase in LCPI. The coefficient of the EXCESS variable indicates that the rapeseed intervention price did vary inversely with production above target levels. The rapeseed weighted intervention price index fell 0.545 units for each percentage point that rapeseed production exceeded the MGQ.

The sunflower seed intervention price responded more strongly to LCPI changes than rapeseed, and responsiveness was greater during the pre-1975 period when both indices were more stable. Estimated elasticities indicating the responsiveness of the intervention price to the change in cost-of-production were 1.34 and 1.17, respectively, in the early and late periods for sunflower seed. The sunflower intervention price index fell an estimated 0.326% for each percentage point that production exceeded the sunflower MGQ. Soybean price results for the shorter 1975–1992 data period were similar to those for sunflowers. The estimated elasticity of the soybean support price with respect to LCPI was 1.11. The price index fell an estimated 0.421 units for each percentage point that soybean production exceeded its MGQ.

5. Oilseeds supply response

Responsiveness of oilseed area to intervention prices was analyzed through a second set of equations. In these regressions, an index of EC-10 oilseed area in hectares (ACI_{it}) was modeled as dependent on returns (RT_{it}) per hectare for each crop. Returns were measured as the product of the intervention price, lagged 1 year, and a 3 year moving average of yield per hectare. Given the three distinct patterns of price movement evident in the rapeseed and sunflower data, three dummy variables were specified: D_1 for years 1968–1974, D_2 for 1975–1987, and D_3 for 1988–1992. Since the soybean data begin in 1975, only D_2 and D_3 were defined for soybeans. Area harvested was modeled as dependent on interaction terms between the dummy variables and returns per hectare as

$$\mathrm{ACI}_{it} = \alpha_i + \beta_{1i} D_1 RT_{it} + \beta_{2i} D_2 RT_{it} + \beta_{3i} D_3 RT_{it} + \beta_{4i} D_1 + \beta_{5i} D_3 + \epsilon_{it} \quad (2)$$

Results and elasticities for the estimated area supply response for rapeseed, sunflowers and soybeans are presented in Table 4. Rapeseed and sunflower area appear to have been quite responsive to changes in oilseed returns. Over 90% of the variation in rapeseed and sunflower seed area is explained by the changes in the returns per hectare indices and the intercept terms. For rapeseed, the elasticity of area with respect to lagged returns per hectare is 1.15 for the early period, 1.23 for 1975–1987, and 0.97 after the 1988 budget agreement. Sunflower area appears to have been more responsive to changes in returns

Table 4
Analysis of oilseed production area response to returns per hectare, 1968–1992

Variables	Coefficients		
	Rapeseed [a]	Sunflower	Soybeans
Constant	−16.808 * (−1.78)	−23.92 ** (−3.06)	−1.518 * (−2.37)
D_1RT	1.338 ** (4.30)	0.517 ** (10.76)	N/A
D_2RT	1.309 ** (10.05)	1.068 ** (8.94)	0.102 ** (3.69)
D_3RT	1.436 ** (5.18)	1.002 ** (4.80)	0.358 ** (4.470)
D_1	11.434 (1.31)	16.440 ** (4.80)	N/A
D_3	23.73 (0.99)	29.234 (1.57)	177.33 ** (33.88)
Goodness of fit [b]	0.925	0.925	0.677
Data period	1968–1992	1968–1992	1975–1992
Area elasticities with respect to returns per hectare index [c]			
Period			
1968–1974	1.15	2.74	N/A
1975–1987	1.23	1.65	0.19
1988–1992	0.97	0.94	0.19

*, Significant at the 10% level of probability; **, significant at the 1% level of probability.
[a] t-values in parentheses.
[b] Squared correlation between observed and predicted values of dependent variable.
[c] Elasticities calculated at mean values of variables for specified data period.

than rapeseed, with elasticities of 2.74, 1.65, and 0.94 for the early, middle, and late data periods, respectively.

Approximately 68% of the variation in soybean area is explained by changes in returns and intercepts, but the most significant variable in the soybean regression is the intercept shifter for the post-1988 budget agreement period. The elasticity of the area index with respect to the return index is only 0.19 for the periods both preceding and following the budget agreement. The lower fit of the regression, and weaker relationship between returns and area likely are due in part to the extreme changes in soybean area that occurred, especially between 1982 and 1987 when the area index rose from 170 to over 4000 (Fig. 2). Observed changes in prices or yields cannot explain such a dramatic increase in area devoted to soybeans.

Although the complexity of the analysis reported above was limited by the shortness of the data series, the results provide evidence that price and area data are generally consistent with the propositions stated at the beginning of this section. Prior to the 1988 budget agreement, sunflower seed and soybean support prices increased at rates equal to or greater than production costs. The budget agreement had an impact, however, since adjusted intervention prices have gone down when target quantities for oilseed production were exceeded. Rapeseed and sunflower seed areas appear to have been quite sensitive to the increased returns per hectare for these crops, which resulted largely from policy induced price increases. Estimated elasticities of area with respect to returns per hectare were greater than one for both rapeseed and sunflowers in the pre-1988 period, and only slightly less than one from 1988 on. Subsequent CAP reforms and trade agreements have impacted the EC oilseeds sector, creating a new policy environment for community producers.

6. Analysis of oilseed agreements

The balance of this study is devoted to simulating the impact of the trade agreements and the 1992 Common Agricultural Policy reforms on the world trade in oilseeds and products using the Static World Policy Simulation Model (SWOPSIM) developed by the USA Department of Agriculture (Roningen, 1986). Industry analysts have predicted that the impact of the oilseeds agreements, the Blair House Agreement and the Memorandum of Understanding on Oilseeds, negotiated between the United States and the EC, represents only a relatively small gain in market share or a freeze in USA market share erosion.

7. Methodology

The Static World Policy Modeling Framework was used to analyze the effects of reductions in EC agricultural support on oilseeds trade between the United States (USA), the European Community (EC) and the Rest of the World (RW). The framework follows the logic of a non-spatial equilibrium model which assumes that domestic and traded commodities are indistinguishable substitutes. The model is parametrized to produce a 1989 database of production, consumption, trade quantities, and prices for each country/region. After the level of support is changed in a country/region, the model's spreadsheet framework uses a variant of the Gauss–Siedel algorithm to recalculate new world reference prices and each country/region's new supply, demand, trade, and pricing data. The model contains own and cross-price elasticities for each commodity in each country/region which provide analysis of an intermediate range solution.

8. Assumptions of the model

The SWOPSIM model built for this analysis is designed to analyze the economic implications of changes in oilseeds policies that can have a global impact on trade. These changes in policies would generally be represented by shifts in supply or demand or changes in prices owing to increased or decreased government intervention in a particular part of the agricultural sector. In this study, the global model consists of three trading regions, the USA, the EC, and RW. The model assumes that each product subsector can be represented by a simple set of supply, demand and trade equations. The supply and demand equations have a constant elasticity form, where elasticities and technical coefficients are based on those reported in the economic literature or published in USDA and OECD studies. The supply and demand relationships are modeled as

$$D_{ij} = D_{ij}(CP_{ij}, CP_{ik}, QS_{ih}, TD_{ij})$$

$$S_{ij} = S_{ij}(PP_{ij}, PP_{ik} \text{ or } CP_{ik}, TS_{ij})$$

where CP_{ij} and PP_{ij} are domestic consumer and producer incentive prices for country i and product j. CP_{ik} and PP_{ik} are consumer and producer prices (for country i) where product k is related to product j. QS_{ih} in the demand function accounts for the use of product j as an input in the production of product h (i.e. poultry/beef supply as a function of the demand for grains). PP_{ik} and CP_{ik} represent substitution possibilities for the producer. TD_{ij} and TS_{ij} account for policy or economic shocks that might shift the demand and supply functions over time.

Trade is defined as the difference between total domestic demand and domestic supply. The global market for each product clears when the net trade for each product sums to zero across all countries and regions.

$$\Sigma T_{ij} = \Sigma S_{ij} - \Sigma D_{ij}$$

Equations in the model, representing policy structure, link the world reference price for each commodity with the corresponding domestic incentive price. The domestic incentive prices for commodities are a function of producer and consumer support and the world price denominated in local currency. Producer and consumer support, CSW_{ij} and PSW_{ij} represent the difference between the domestic price and the world reference price. This difference in domestic and world prices is modeled as a 'wedge' and is manipulated to incorporate the effects of price changes owing to the implementation of trade agreements and domestic agricultural policies

$$CP_{ij} = \text{CSW}_{ij} + F(E_i \text{WP}_j)$$

$$PP_{ij} = \text{PSW}_{ij} + G(E_i \text{WP}_j)$$

E_i is the exchange rate of country/region i with respect to the USA dollar. WP_j represents the world reference price for product j in USA dollars. F and G represent the price transmission elasticities.

Support for producers and consumers is represented by two types of wedges: (1) a market support wedge where a tariff (negative) or a subsidy (positive) creates a price wedge between the domestic price and the world reference price, and (2) a direct payment wedge which does not effect the observed market price but is part of the domestic incentive price. Price wedge data were obtained from ERS calculations of producer and consumer subsidy equivalents (Webb et al., 1990).

All supply, demand and trade equations for each country/region in the model are initialized to a specific base year, 1989. The global model is then assembled, where world trade for all products is in a state of equilibrium. Policy shocks are implemented via changes in supply, demand or price wedges and new equilibrium amounts produced, demanded, exported, imported, and new equilibrium domestic prices are determined simultaneously for each country as are the new world reference prices for each commodity (Roningen and Dixit, 1989; Roningen, 1991; Roningen et al., 1991a; Roningen et al., 1991b).

9. Data

The data used in this analysis are derived from the USA Department of Agriculture's SWOPSIM Database (World), consisting of 33 countries and regions. The data are for the 1989/1990 marketing year. They include base quantity and pricing data for supply, demand, production and trade for each country/regions.

Specific data for the United States (USA), the EC-12 (EC), and the Rest of the World (RW) for 22 commodities were included in the model. The 22 commodities represent the agricultural sector for each country/region. These include beef and veal, mutton, lamb and goat, pork, poultry meat, poultry eggs, dairy milk, butter, cheese, milk powder, wheat, corn, other course grains, rice, soybeans, soybean meal, soybean oil, other oilseeds (rapeseed, sunflower, peanut, cotton, and flax, combined), other oilseed meal, other oilseed oils, cotton, sugar and tobacco (Roningen et al., 1991a).

10. Modeling 1992 CAP reforms

The 1992 CAP reforms instituted by the EC contained provisions to reduce the supply and support prices of certain commodities while creating a corresponding system of direct compensation payments to producers. The supply reductions were achieved through land set-aside requirements of 15% for cereals and grains. These set-asides were implemented as supply reductions for wheat, corn, barley, and other coarse grains, mainly rye, oats, sorghum, and millet, in the equilibrium model. The reductions in the price supports for beef, pork, sheepmeat, butter, skim milk powder, wheat, corn and other coarse grains were also included in this analysis.

Cuts in export restitution were applied directly to the export subsidy wedges where appropriate. EC producer subsidies for both soybeans and other oilseeds were reduced in order to reflect the realignment of the returns to producers of oilseeds with those of producers of cereals 'as specified in the CAP reform'. The effects of the EC new oilseed policy and the trade agreements were analyzed using the SWOPSIM model described earlier.

'Two policy scenarios were modeled after adjusting the baseline data for the 1992 CAP reforms'. The first scenario is a simple 10% oilseeds supply reduction with no subsidy reduction penalty. This is the 'ideal' situation which satisfies the BHA. While the BHA agreement states that the set-aside requirement is 15%, adjustments were made to compensate for the number of small producers not participating in the set-aside scheme. Adjustments also were made to account for overshoots of the base area, which diminish the full effect of the set-aside requirement. The second scenario models the actual situation for the 1994–1995 crop year when production overshot the baseline supply by 9% for a net reduction in oilseeds output of 1% (9% supply overshoot minus 10% BHA reduction). This triggered a 9% cut in oilseeds subsidies as specified in the MOU. Simulations of the two scenarios are discussed in the following section.

11. Modeling the BHA supply reduction and penalties imposed in the MOU

The results of the modeling exercise are divided into the two parts, those relating to the 'soybean complex' and those relating to the 'other oilseeds' category. This is consistent with the structure of the

SWOPSIM model and the USA–EC trade agreements.

Simulation results indicate only small gains for the USA and RW regions from the reduction in EC soybean production. In the simulation, EC imports of soybeans increase 1.3% in quantity and 1.7% in value (Table 5). USA exports rise 0.8% in quantity and 1.2% in value, or 139000 metric tons and $57 million, respectively. Soybean exports from the RW increase 0.1% in quantity (11000 metric tons) and 0.5% ($15 million) in value. The simulated price effects were less than $0.73 per t and $0.37 per t in the USA and RW, respectively. These changes do not represent very significant gains to either region in the soybean complex as a result of the Blair House Agreement.

In the other oilseeds category (Table 6), the 10% set-aside reduction had a larger relative impact on

Table 5
Simulation of trade policy scenarios based on Blair House Agreement applied to EC soybean sector

Percentage change in	Policy mix: set-aside only, 10% supply reduction, 0% subsidy reduction	Policy mix: actual situation, crop-year 1994–1995, 1% supply reduction [a], 9% subsidy reduction [b]
USA		
Production	0.2%	0.0%
Producer price	0.4%	0.1%
Market price	0.4%	0.1%
Consumption	−0.1%	0.0%
Consumption price	0.4%	0.1%
Exports	0.8%	0.2%
Export value	1.2%	0.2%
Imports	−0.8%	−0.2%
Import value	−0.4%	−0.1%
EC		
Production	−10.0%	−1.6%
Producer price	0.3%	−2.4%
Market price	0.4%	0.1%
Consumption	−0.1%	0.0%
Consumption price	0.4%	0.1%
Exports	0.0%	−0.3%
Export value	0.0%	−0.2%
Imports	1.3%	0.2%
Import value	1.7%	0.3%
RW		
Production	0.0%	0.0%
Producer price	0.2%	0.0%
Market price	0.2%	0.0%
Consumption	0.0%	0.0%
Consumption price	0.2%	0.0%
Exports	0.1%	0.0%
Export value	0.5%	0.1%
Imports	−0.1%	0.0%
Import value	0.3%	0.1%

[a] 10% set-aside reduction with 9% oversupply equals 1% supply reduction.
[b] Penalty for oversupply.

Table 6
Simulation of trade policy scenarios based on Blair House Agreement applied to EC other oilseeds sector

Percent change in	Policy mix: set-aside only, 10% supply reduction, 0% subsidy reduction	Policy mix: actual situation crop-year 1994–1995, 1% supply reduction [a], 9% subsidy reduction [b]
USA		
Production	1.0%	0.4%
Producer price	1.9%	0.7%
Market price	1.9%	0.7%
Consumption	−0.9%	−0.3%
Consumption price	1.7%	0.7%
Exports	12.3%	4.9%
Export value	14.4%	5.7%
Imports	−12.3%	−4.9%
Import value	−10.7%	−4.2%
EC		
Production	−9.4% [c]	−3.8%
Producer price	1.9%	−3.8%
Market price	1.9%	0.7%
Consumption	−0.9%	−0.2%
Consumption price	1.7%	0.7%
Exports	0.0%	0.0%
Export value	0.0%	0.0%
Imports	20.0%	8.1%
Import value	22.2%	8.8%
RW		
Production	0.3%	0.1%
Producer price	0.9%	0.4%
Market price	0.9%	0.4%
Consumption	−0.4%	−0.2%
Consumption price	0.9%	0.3%
Exports	5.9%	2.4%
Export value	7.8%	3.1%
Imports	−5.9%	−2.4%
Import value	−4.1%	−1.7%

[a] 10% set-aside reduction with 9% oversupply equals 1% supply reduction.
[b] Penalty for oversupply.
[c] Since the SWOPSIM solution is an intermediate run solution, the 10% set-aside program results in an 9.4% reduction in supply simply because producers respond to the higher prices.

the EC, USA and RW regions because approximately 90% of EC's oilseeds supply (56% rapeseed, 34% sunflower seed, and 10% soybeans) is accounted for in the other oilseeds category. EC imports of other oilseeds increase by 20% or 711 000 metric tons worth $515 million, ceteris paribus. The USA exports an additional 94 000 metric tons while the RW exports 382 000 metric tons of additional oilseeds. Thus, the RW gains relative to the USA due to the EC's set-aside program for other oilseeds. This was expected because the USA exports mainly sunflower seeds while the RW exports rapeseed, sunflower seed and other minor oilseeds.

12. Simulation of the 1994 crop year accounting for overshoot penalties

Simulations of the 1994–1995 crop-year scenario (reported in the last column of Tables 5 and 6) indicate that the set-aside policies and concurrent penalties would have very little effect on international oilseeds trade for the three country/regions. The quantity of USA soybean exports increases by 0.2%, as does export value. The volume of RW exports of soybeans remains unchanged, while the value of exports increases by 0.1% owing to export price increases. The quantity of soybeans imported by the EC increases by 0.2% (the same amount by which USA exports increases), while the value of EC imports of soybeans rise by 0.3%.

There was a more dramatic impact on trade in the other oilseeds category (Table 6). USA exports of other oilseeds increase almost 5.0% by quantity, while the value of exports rise by 5.7%. Exports from the RW increase by 2.4% in quantity and 3.1% in value. Imports of other oilseeds by the EC rise by 8.1% in quantity and 8.8% in value. 'Since the USA is a very small producer of other oilseeds (rapeseed and sunflower seed), gains in trade were captured primarily by major producers in the RW region'. The simulation of the 1994–1995 crop-year scenario indicates that the set-aside policies and concurrent penalties will have little impact on soybean trade but will have a more significant effect on trade in other oilseeds.

Guyomard and Mahé simulated the implications of CAP reforms on USA and EC trade using the Modèle International Simplifié de Simulation (MISS). The results of their analysis of 1992 CAP reforms, Blair House, and Decoupled Reform are compared with the prereform baseline CAP environment. They concluded that the main effect of the CAP reform is to stimulate the domestic demand for grain as animal feed through relative price changes. Prices of grain substitutes such as corn gluten feed decline, approximately 14–16%, depending upon the respective reform packages (Guyomard et al., 1994, p. 179). Their analysis also indicates a modest loss of oilseeds and product exports to the EC owing to declining feed demand. The results of simulation analysis, including the one in this study, are sensitive to the assumptions about changes in relative prices and exogenous factors such as income and population growth.

While this study has focused on changes in oilseeds production, prices and trade owing to CAP reform and trade negotiations, the oilseed meal market should not be ignored although it was not the focus of the ASA's Section 301 petition. The Organization for Economic Cooperation and Development (Organization for Economic Cooperation and Development, 1994a) has summarized the results of numerous studies on the demand for oilseed meals. Forecasts of EC oilseed meal utilization under the new CAP regime range from a small increase in oilmeal use compared with the 1992 base period to a decline of 6 million tons in the medium-term (Organization for Economic Cooperation and Development, 1994b, p. 37). These forecasts are quite sensitive to the changes in demand for livestock products, poultry and pork versus dairy and beef, and the derived demand for feed ingredients. Helmar and coworkers (Helmar et al., 1995) reached similar conclusions when they simulated the impacts of the CAP reforms, the Blair House Agreement, and domestic farm policies of major trading countries. After adjusting for the oilseeds agreement, their analysis indicated relatively little change in soybean trade and "... no shifting of trade within the soybean complex among exporters" (p. 40). These studies have predicted net reductions in oilmeal use owing to the substitution of cereals for oilseeds in feed rations, one of the objectives of changing relative prices under the new CAP regime. Ultimately, the OECD concluded that "Most studies indicate firmer EC import demand for oilseeds than oilmeals" (Organization for Economic Cooperation and Development, 1994b, p. 37).

13. Conclusions: the oilseeds agreements — a success or failure?

The decrease in USA oilseed exports and EC market share in the 1980s led to the 1987 ASA's Section 301 petition to end alleged unfair trading practices of USA partners. The petition alleged that EC oilseed support and trade policies discriminated against imports of USA oilseeds in violation of the 1962 tariff binding.

Our analysis provides evidence that increases in EC oilseed intervention prices roughly tracked increases in costs-of-production, at least until 1988. In the cases of sunflower seed and soybeans, intervention prices grew faster than production costs during much of the late-1970s and early-1980s. Additional evidence suggested that, after 1988, reductions of oilseed intervention prices occurred in response to EC production above the target levels specified in the 1988 budget agreements. Regression results also suggested that the EC area planted to rapeseed and sunflower seed was responsive to these increases in intervention prices, resulting in increased EC production. EC soybean plantings were also shown to be positively related to EC support prices, but the impressive growth in soybean area was beyond what could be explained by the observed increases in commodity prices alone.

While these findings give some credence to USA complaints that EC policy stimulated production and displaced USA imports, other indicators suggest that increased EC production was not the only cause of the decline in USA exports and market share. Total EC oilseed imports trended up throughout the period from the mid-1960s to the 1990s, and both EC producer and RW importer market shares increased as the USA share declined. Furthermore, our simulations of the Memorandum of Understanding on Oilseeds and the Blair House Agreement, after the CAP reforms, suggest that RW exporters will likely benefit more from these agreements than USA producers.

In the short run, the final version of the oilseeds agreement pleased neither European farmers nor American soybean producers (American Soybean Association, 1994, p.1). The agreement did not provide an immediate remedy to offset the alleged losses in exports incurred by USA soybean producers nor did it enhance EC internal policy reforms. Even if the EC supply reduction is the full 10% as contained in the agreements, USA soybean exports to the region increase less than 1%, ceteris paribus. Thus, the gains in trade for the USA are marginal. Did the USA achieve its objectives in bringing the oilseeds trade dispute before the GATT? The simulation indicates a very small impact in the soybean sector from the implementation of the oilseeds agreements. Moreover, the 1994–1995 overshoot in EC oilseeds production is evidence that supply control measures, including penalties, will not limit production sufficiently to boost USA exports. Since the USA is not a rapeseed producer nor a major sunflower seed exporter, the gains in trade in other oilseeds accrue to the RW. In the long run, the USA will have to depend upon its comparative advantage, not trade negotiations, to preserve or enhance its share of world oilseeds trade.

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