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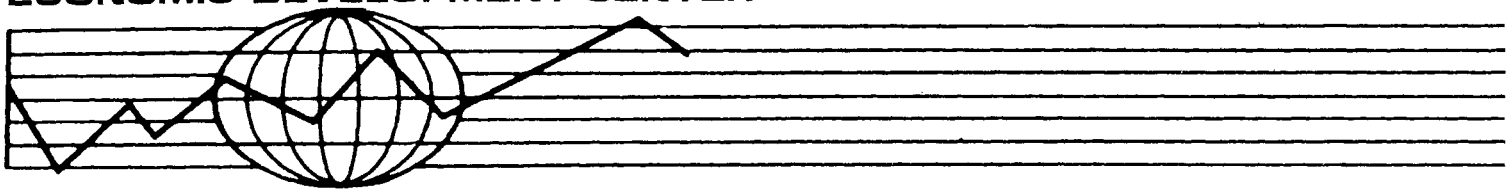

BILATERAL HARMONIZATION OF EC AND U.S. AGRICULTURAL POLICIES

L.P. Mahé and C. Tavéra

ECONOMIC DEVELOPMENT CENTER

Department of Economics, Minneapolis

Department of Agricultural and Applied Economics, St. Paul

UNIVERSITY OF MINNESOTA

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by

L. P. Mahé** and C. Tavéra**

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**Institut National de la Recherche Agronomique, Rennes, France.

Abstract

Agricultural policies in both Europe and the United States provide commodities with an excessively high and distorted pattern of support. The economic interdependencies of the policies give rise to adverse fiscal and economic costs, which are viewed as disharmonies in the existing policy measures both within and between the two regions. Unilateral and simultaneous EC and U.S. policy changes are simulated with an international trade model. They are carried in three steps: (1) grains and feeds, (2) beef and dairy, and (3) sugar. Both cross effects and own effects are examined on typical policy targets. Results suggest that while world prices are sometimes drastically altered, the magnitude of cross effects is small and sometimes ambiguous compared to own effects. Feed livestock linkages are dominant factors in the economic rationale behind the interactions between countries. The case for cooperation in this trade game is, however, supported by the evidence from at least a budget point of view.

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I. INTRODUCTION

In the aftermath of the oil shocks the agricultural sectors in most countries have suffered from a long and deep crisis, although the timing of events, the economic factors at work and the adjustment of policies have been quite different in various areas. The European Community (EC) and the United States (U.S.), as major producers and traders of agricultural products, have played a major part in the development of these events. In the European Community farm incomes were depressed after the first oil shock. This was mainly due to a cost squeeze effect from high rates of inflation. EC policy makers have tended to alleviate these problems by continuing the price support policies, being somewhat lured by the high world prices of the early seventies. In the late seventies price supports were curtailed but the downward pressure on prices was somewhat relieved in the early eighties after the second oil shock. In recent years high budget costs, growing exportable surpluses and large public stocks have again strengthened this pressure.

The U.S. had very good years in the seventies as real commodity prices rose with trade volumes expanding, thanks to a weak dollar and a world demand not yet choked by the induced implications of the oil boom and the subsequent economic slack. As the prospects turned around, the 1980s became unbearable as well in the U.S. and the costs of farm programs have moved to record levels.

Under these circumstances great hopes have been placed by many countries in the GATT negotiations, expecting a significant contribution from a better discipline of international trade behavior. It is quite

visible that exporting countries are more active, display more efforts to alleviate trade barriers, and argue for free trade as a desirable target. The U.S. appears to be part of that group. Other countries which are either importers or have inward looking agricultural policies exhibit much less enthusiasm to see action taken. The EC clearly belongs to the latter group as its policies were designed for a net importing situation while it has now inadvertently become a net exporter of many commodities. A lot of external pressure is now exerted on the EC as this net exporting situation is viewed as lacking legitimacy since it is largely due to protectionist policies.

As a result of these developments EC-U.S. agricultural trade relations have become tense over the last few years, to a degree rarely attained before. Two dimensions seem to emerge in the context of the EC-U.S. trade conflict. One is the domestic political economy of agricultural policy making which is a widespread feature of developed countries becoming more protectionist for agriculture as they get richer (Honma and Hayami, 1986). The other is the international dimension of farm policies. Countries with large trade shares cannot ignore both the consequences of partner policies on their own agricultural targets, nor the effects of their own programs on other countries' success or failure to achieve their objectives. This interdependence creates an externality of a probable significant size that is induced by policies which are often designed only for domestic purposes and mainly driven by domestic forces, but which impact other actors in the world agricultural trade game. In that context it is certainly appealing to view freer trade as a public good since some passive actors cannot be

excluded from potential gains (Runge, et al., 1987; Ruttan and von Witzke, 1987).

In this paper we view the EC-U.S. relations in a game framework, where they are both active players with defined strategies and where the rest of the world is essentially passive although not unaffected, since it participates in world price and trade formation. An attempt is made to characterize the nature of the game of the trade war or policy cooperation between the EC and the U.S. While aggressive actions were envisaged in a previous study (Mahé, et al., 1987), the design of strategies, i.e., policy options, analyzed in the present work was geared toward discovering areas for cooperation between the two trading partners while contributing, at the same time, to the solution of domestic problems. In that sense a whole set of conceivable strategies will not be covered and only a partial characterization of the U.S.-EC agricultural trade game will be illustrated.

The policy options taken under consideration were defined in the context of the study launched by the EC Commission[1] on "Disharmonies in EC and U.S. Agricultural Policies". The concept of "disharmony" in agricultural policy measures in this context is viewed in a rather wide perspective (EEC, 1988, Chap. 2). A disharmony exists whenever "a set of policies have not reached their objectives given existing constraints". The concept is not seen as being equivalent to uneven rates of protection or to price distortions. Instead, the policy targets are expected to be better fulfilled by reducing the overall level of support and narrowing the range of support rates provided to various commodities.

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[1]It should be made clear that in the analysis described here, the views are those of the authors and not of the EC Commission.

It seems fairly easy to trace back the origin of the budget costs and of other costs of both EC and U.S. agricultural policies to the generally high level of price support prevailing over the recent years. But a significant part of these costs are also due to existing inconsistencies within policy programs. Some of them, for example, relate to uneven rates of support granted to close substitutes either in production or in final and intermediate consumption. Everyone knows the famous case of grains substitutes, but there are many other distortions of this kind when a cross-commodity viewpoint is taken in assessing agricultural policies.

Harmonization in the present context consists of an adjustment of EC and U.S. policies in three[2] steps dealing successively with (1) grains and feeds, (2) meat and dairy, and (3) sugar. The implications of these policy changes on various policy targets are evaluated for each possible combination of actions of the two partners. Estimates of both own and cross effects of the policy changes allow uncovering acceptable or attractive combinations of strategies for both countries. As a consequence the issue of coordination of policy reforms as opposed to isolated actions are assessed within our framework.

Section 2 describes the existing situation of disharmonies as related to protection rates, and the actual context of the contemplated policy options. In Section 3 some features of the model used and of the problems of implementation are highlighted. Section 4 is devoted to the simulation results with emphasis placed on the economic rationale behind interactions

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[2]In the original Study a fourth step dealt with fats which are not considered here (CEE, 1988).

between EC and U.S. policies and on the opportunity for both countries to act jointly.

II. EXISTING DISHARMONIES IN POLICIES AND POLICY OPTIONS FOR HARMONIZATION

Disharmony is not equivalent to even rates of support and even rates of protection do not imply even rates of support. However the large gap between existing rates of protection provided to commodities are likely to induce undesired budget costs and welfare losses. Reducing some of these gaps, while cutting down on the general level of support, is expected to bring significant budget savings and welfare gains.

In Figure 1 are displayed estimates of protection rates for commodities covered in the present study. They can serve as a basis to discuss briefly some of the major disharmonies[3] existing in both EC and U.S. agricultural policies. The price distortions induced by these unbalanced rates of support across commodities have both domestic and international implications, so that perverse effects of domestic policies may cross the border and the cost of a disharmony may be externalized to trade partners.

In the European Community one major well-known area of price distortion is the grain-oilseeds-feed (GOF) sector (de Veer, 1986; Mahé, 1984). High grain prices and zero tariffs on oilseeds and meals as well as on so-called grain substitutes have induced a major substitution of imported feeds for European produced grains in the compound feed sector.

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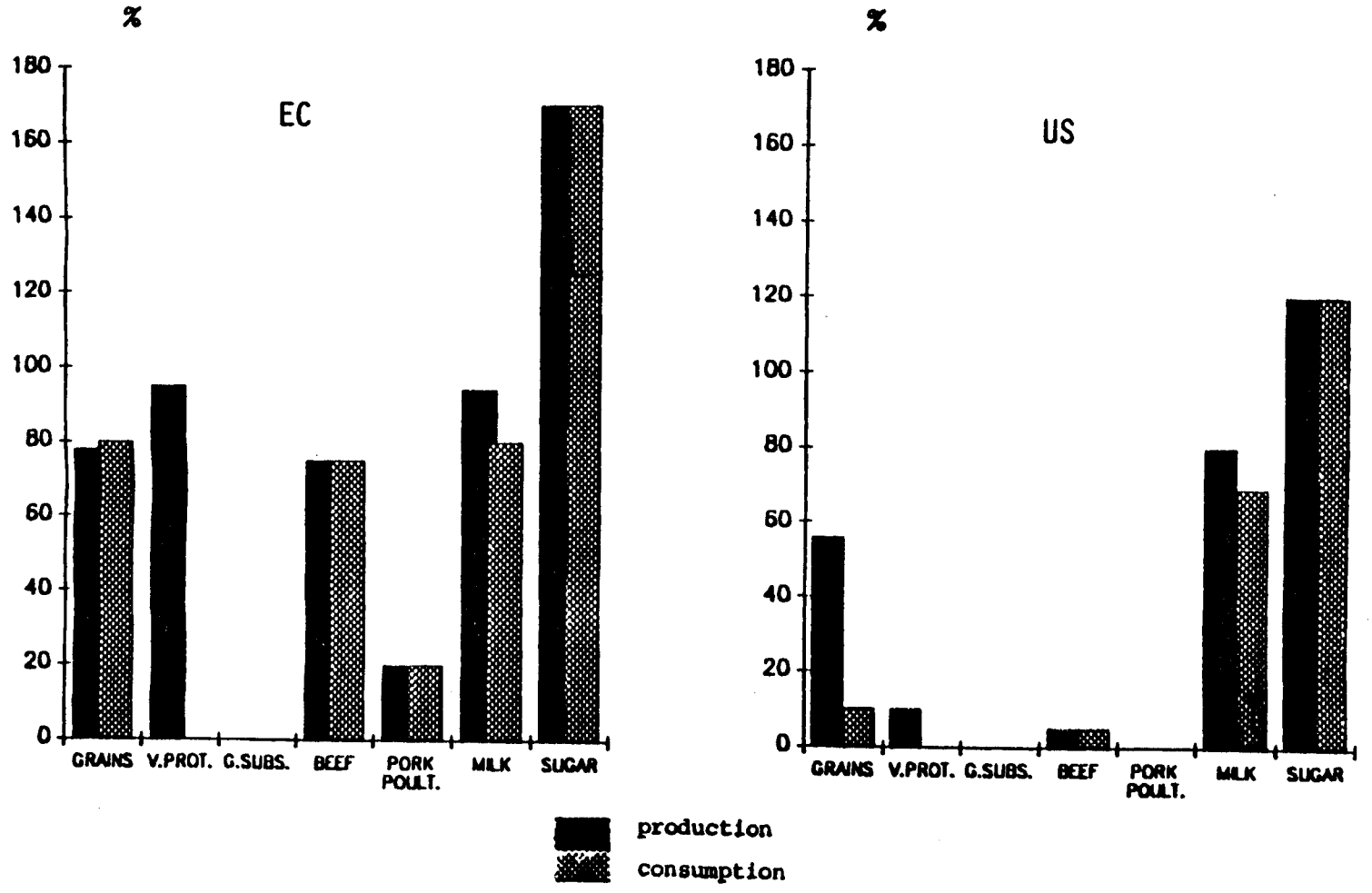
[3]A broader picture of existing disharmonies may be found in EEC, 1988, Chapters 3 and 4.

Figure 1. EC and U.S. Rates of Protection (1986).



Grain exports have been further enhanced and the cost of restitutions has increased. In order to improve the level of self-sufficiency in vegetable protein used in animal feed, the EC has also developed what amounts to a deficiency payments system on oilseeds to promote import substitution. As production grew, so did the costs to CAP budget. As can be seen in Figure 1, oilseeds have now become even more protected than grains and the downward pressure on grain support prices has shifted the budget burden from grain to the cost of expanded oilseeds production. In this GOF subsector price distortions occur between commodities which are close substitutes in both production and derived demand.

There are also likely distortions between feed pricing and livestock products pricing in the Community. Cheaper imported proteins are not quite consistent with the highly protected dairy sector nor with the highly supported meat products. This has added to the fast growing surplus problem of dairy products in Europe and also induced artificial differences in competitiveness between regions and member states. As a consequence, national interests have made it unfeasible to design a common strategy to attack this problem at the EC level, hence the long-lived status quo.

EC's sugar policy is also a stereotype combination of instruments designed to avoid some perverse effects arising from the initial high price support policy. Import quotas from so-called ACP countries (Africa, Caribbean, Pacific) coexist with a costly export subsidy program, while a producer's levy on both A and particularly B producers' quota are used to alleviate budget cost. The overall outcome is a large consumer cost and pervasive attempts to stop other sweeteners from substituting for beet or cane sugar in the food industry.

The U.S. programs are also characterized by price distortions that impact on budget and welfare. A target price significantly higher than the loan rate makes the budget quite sensitive to world prices and to the strength of the dollar as the early eighties have demonstrated. The absence of a target price scheme in the soybean programs tends to stimulate the substitution of corn for soybeans, thus making soybeans and soybean by-products more expensive relative to feed grains in animal feed. As in the case of the EC, the U.S. has an inconsistency between the non-supported price of feeds and the highly protected dairy sector. This situation will hamper the efficiency of supply control measures of the dairy sector.

Another typical and fairly far reaching distortion lies in the beet and can sugar program in the U.S. This sector, highly protected through import quotas, has experienced decreasing market shares as the competition from corn sweeteners was fostered by relatively cheap corn prices at the user level.

The latter case illustrates how the international linkages tend to "export" the perverse effects of these disharmonies. The U.S. sugar (and alcohol) program stimulates the production of byproducts of the sweeteners industry, i.e., corn gluten feed, which cannot compete with cheap feed grains in the U.S. but are sucked into the EC because of high user grain prices. Hence a further aggravation of EC unbalances and surpluses. This is a case where disharmonies in two countries seem to fuel each other resulting in high costs for everybody. Adverse effects of EC and U.S. disharmonies in price supports are also transmitted to other countries like New Zealand, Brazil, Argentina and other developing countries whose economy cannot afford the taxes to support agriculture.

The foregoing analysis of existing disharmonies paves the way to design changes likely to bring savings and social benefits to both partners. The rationale behind the three policy options described in Table 1 should be evident from the analysis sketched above, although the magnitude of the changes reflects on intuitive assessment of balanced and feasible packages rather than a strict economic rationale.

Option 1 implies a change of a single policy instrument in the U.S.[4] In the case of the EC, Option 1 already includes a balanced package aiming at improving EC's situation and providing some relief to U.S. problems as well; hence the large cut in grain and oilseeds producer's price support and the small border tax on imported feeds. This option is also expected to be acceptable from the U.S. point of view as it involves a large cut in EC's grain restitutions.

The design of policy options also embodies concerns about cross-commodity effects, input-output price distortions and, in particular, feed livestock interactions. This is why pork and poultry prices are cut and dairy quota is kept active in EC for Option 1, to prevent creating perverse effects in partial moves toward harmonization. It is quite clear that without the latter features in Option 1 a significant part of the benefits would have been lost through leakages as the costs of existing policies in the animal sector would increase.

Option 2 further strengthens the balance of support by cutting prices for dairy and all meats. Budget savings are expected from avoiding a shift of resources (including land) to even more costly commodities. This

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[4]A target price for soybeans was considered initially but later abandoned due to budget costs.

Table 1. Definition of Policy Options

Three active options are considered for each country beside the passive one. They are made with packages which cumulates from 1 to 3. Table 2 summarizes the main features.

Table 1 - Definition of Simulated Options

	EC	U.S.
- Option 0	no change	no change
- Option 1		
. grains	- 20 percent (support price)	- 10 percent (target price)
. oilcakes and veg. proteins	+ 10 percent tariff - 20 percent (support price)	Loan Rate follows world prices
. cereal substitutes	+ 10 p.c. tariff	no change
. pork and poultry	- 7 p.c. (support price)	no change
. milk, sugar	quota active	import quota
- Option 2 = Option 1 and in addition:		
. beef	- 15 p.c. (supp.price)	no protection
. milk	- 25 p.c. (supp.price)*	- 25 p.c. (supp. price)*
. pork and poultry	- 2 p.c. (supp.price)	no change
- Option 3 - Option 2 and in addition:		
. sugar	- 40 p.c. on the A quota price	- 30 p.c. on the support price

*effective producer price falls by only 20 percent in the EC because of an assumed 5 percent rent due to the quota. Effective consumer price falls by less than 25 percent (namely 20 in the EC, 18 in the U.S.) since domestic consumption subsidies are abandoned except for veal feed.

approach follows the perceived necessity to design policy changes with a global perspective on the sector. Such a comprehensive approach is necessary to avoid perverse effects of partial measures correcting some distortions while others are kept, as suggested by the second best theory.

Option 3 pursues the equilibration of supports or at least corrects some gaps created by previous changes. Sugar price supports are cut drastically to avoid increasing the rent on the A sugar quota and further distortions between grains and sugar prices as a result of Options 1 and 2. In both EC and U.S., significant consumer gains are also expected.

It is not obvious from the starting point that both countries would benefit from the complete implementation of the options. The two partners may not like equally a given step of the harmonization process. And it may be that one partner would prefer some combination of options and the other a different one. The outcomes of all possible combinations of options from no change (Option 0) to full harmonization must be analyzed. Then, upon consideration of different policy targets likely equilibrium positions can be uncovered, corresponding to the outcomes of a negotiation which would follow the rules of the game defined here. Table 2 stylizes the 16 possible solutions of the process. While the first row describes a unilateral EC movement toward harmonization, the first column corresponds to an isolated U.S. move. The diagonal displays the outcomes of joint action which can be contrasted with single-country harmonization in either EC or U.S.

Table 2. The structure of the combined options in the "harmonization game".

United States harmonizes in :		EC Harmonizes in the subsectors : None (0)	Grains and feed (1)	Beef and dairy (2)	Sugar (3)
None	0	(0,0)	(0,1)	(0,2)	(0,3)
Grains and feed	1	(1,0)	(1,1)	(1,1)	(1,2)
Beef and dairy	2	(2,0)	(2,1)	(2,2)	(2,3)
Sugar	3	(3,0)	(3,1)	(3,2)	(3,3)

III. MODELLING INTERACTIONS BETWEEN EC AND U.S. AGRICULTURAL POLICIES IN A GAME FRAMEWORK

The various combinations of options in Table 2 were simulated with the trade model MISS, with cross checks made with the OECD MTM model, particularly for world price changes in the main scenarios.

MISS is a simplified world trade model which allows for comparative static analysis of policy changes around a base situation. In Thompson's terminology it is a non spatial price equilibrium model. When policy changes occur for one or several commodities in one or many countries, the model first solves for the new supply and demand levels and for the world price changes which bring the net world excess supply back to zero. Budget cost, farm income and other indicators for each economic zone are calculated in a simplified fashion. Trade flows between the economic zones cannot be calculated by this model.

The behavior of the model is led by matrices of direct and cross-price elasticities of agricultural supply, of derived demand for feeds, and of final demand. Domestic prices can be either exogenously fixed or linked to world prices by protection rates as in the case of fixed ad valorem tariffs, subsidies, taxes; shifts of supply, demand, or exchange rates can also be performed.

A. Scope and Parameters

The basic model is more fully described in Mahé and Moreddu (1986) but it has been revised for the present exercise (see Mahé, et al., 1988). In the current version it covers four zones: EC, U.S., rest of the world market economies and centrally planned economies (CPE). The latter are supposed to be unresponsive to world price changes. Therefore, only market economies are involved in world price adjustments to EC and/or U.S. policy changes, but the assumption made on CPE countries increases world price sensitivity to policy changes in EC and U.S.

The basic data include a balance sheet for each zone and each product and the levels of protection for the reference period which is in the present case a "representative 1986". Seven commodity groups are included: (1) cereals (wheat and coarse grains), (2) oilcakes, (3) cereal substitutes (millings and other vegetal byproducts, corn gluten feed, manioc and citro-pulp), (4) beef meat, (5) pork and poultry, (6) milk, and (7) sugar. It should be clear that the aggregation of all "substitutes" may raise some problems of interpretation since they actually differ in (a) their currently existing protection rate; (b) their energy-protein ratio; and (c) their production conditions and therefore supply elasticities (manioc vs. corn gluten feed). But in the options defined in the Study, policies affecting imported components are changed mostly in a parallel fashion.

B. Model Calibration and Choice of Elasticities

Supply and demand price elasticities are shown in Annex Table 1. They are derived from a review of estimates used in other studies and adjusted in the Study group. Although there is no time scale in a comparative static model, the magnitude of supply response must be calibrated with a time horizon in mind. It was a medium term 3 to 5 years in the present case.

More consistency in the choice of the parameters was looked for in order to improve the behavior of the model. This consistency may be improved, first, by using the homogeneity and symmetry properties of the output supply and derived demand system (Sakai, Diewert); second, by making use of technical knowledge like complementarity between beef and milk in Europe, and substitution or independence in the U.S. Attention was also given to the coherence between animal products response to their own prices and derived demand for feed response to these same prices. This has been made easier in MISS by distinguishing feed demand from food demand.

The approach consists of starting with a variable profit function, for the whole sector with the seven included outputs plus one for the rest of agriculture and four feed items (grains, vegetal proteins, grain substitutes plus two other inputs for completeness of variable intermediate consumption). Primary factors are assumed fixed for the whole sector except for capital. The shares of outputs and variable inputs in variable profit have been estimated for EC and U.S., adding grains fed on farm to the feed cost reported in the accounts and to the final output in order to capture their full cost-derived demand effect. Because of the substitutability between outputs in European agriculture, the elasticities

were assumed fairly large which is in line with results from various econometric studies when cross effects are included. Large cross effects were often found in estimation work done on the agricultural sector in France. Slight output substitution between crops and grazing livestock is assumed in Europe, less so in the U.S. A large substitutability is assumed between crops and a beef-milk complementarity is introduced in Europe (substitutability in the U.S.). These assumptions brought elasticities in line with expected orders of magnitude. The relationships between animal products and feed elasticities made use of the knowledge of the intakes of grain, cakes and substitutes by each species estimated in another study (Mahé and Munk, 1988). The elasticities of derived demand for feed with respect to livestock products prices were deduced from its own and cross supply elasticities of these animal products weighted by corresponding input shares in total use (locally constant proportions). The symmetry condition provided the effect of feed prices on output supply. The outcome suggests that while substitution exists between individual feed items when total feed is constant, input substitutability decreases sharply when the output effect due to animal supply response to feed cost is included as in this full model matrix. The more so as we deal with aggregated groups of ingredients, and as the behavior is meant to represent medium run response. This is in line with what Sakai calls a normal technology.

For the rest of the world, cross effects were dropped because of little knowledge and because natural conditions often differ from Europe and the U.S.A. smaller direct elasticities were chosen as a consequence. The parameters used are assumed relevant for the medium term and are given in Annex Table 2, their magnitude is somewhat in line with those of the

OECD model and of Valdés and Zietz (1980). Published estimates of import demand elasticity vary over a wide range according to methods and specification (Gardiner and Dixit, 1987). The information collected by these authors suggests that direct estimation leads to a smaller import demand elasticity (in the case of U.S. grain exports) than the one implied by deriving it from supply and demand elasticities.

C. Policy Formulation and Model Outputs

There is a real challenge in maintaining a simulation tool which can accommodate many policy instruments which differ from one commodity to the next and also often coexisting in the same program for a given commodity. The model MISS was originally designed to simulate policy changes expressed as ad valorem tariff-equivalents, so that an homogeneous treatment of commodities was possible.

The introduction of variable levies, target price with deficiency payments, production quotas, import quotas, consumption subsidy, correspondability levy, etc., makes difficult the task of adjusting the model system, while keeping its general flexibility.

The model can accommodate coexisting instruments such as pegged domestic prices (supply and/or demand), production quotas, fixed ad valorem tariffs, supply-demand shifts (set aside). In the case of production quotas, the budget cost, income and consumer surplus changes are calculated by using the relevant market price changes while supply and derived demand behavior is led by the effective or shadow price changes. There are some difficult cases such as EC's dairy or sugar quotas where a stock of rent has to be exhausted before actual supply response can take place. In the case of dairy, a five percent rent is assumed and for sugar

the 40 percent gap between A and B prices are treated as a rent so that supply does not react to the price cut, while only demand does. The capability to peg or alter domestic prices leads to an assumption of zero elasticity of price transmission from world to domestic prices in the relevant cases. For other commodities, as for soybeans[5] in the U.S. (both supply and demand) or oilseeds in the EC (only demand side), domestic prices follow proportionally world prices.

There are no storage costs in the model. Excess supply has to be financed either by export subsidies, foreign donations or delayed deficiency payments (PIK program). In the U.S., the set-aside program was specified as an export supply shift on the bases of external information (e.g., Meyers, et al.; Gardiner; OECD). In the EC, the complex sugar policy is specified in an ad hoc fashion, so as to reflect mainly the relevant budget savings[6] and income losses.

The farm income indicator used is the value added, i.e., the difference between total sales and feed and other purchased inputs. It is assumed that the prices of commodities excluded from the study are unchanged as well as the prices of intermediate consumption other than feed. The procedure used to calibrate the supply system allows one to make the relevant calculations. Resources are shifted toward the "rest of agriculture" and income effects are dampened as a consequence. Budget costs are calculated with a simple formula which is directly applicable

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[5]If loan rates had been pegged in the U.S., EC's influence on the U.S. soybean program would have shifted from farm income to the budget.

[6]In the case of sugar the export refunds corresponding to ACP import quota were not considered as a part of the domestic sugar regime cost (but development aid).

when policy instruments are support prices, corresponsibility levies, deficiency payments, tariffs or export refunds. Consumer surplus changes are calculated in the traditional Marshallian way. The welfare indicator is the sum of the transfer changes (producer, consumer, taxpayer).

D. Estimation of Protection Rates, Domestic and "World" Prices

For each product and each zone, protection rates representative of the protection provided to producers, to animal feed uses and to human consumption are calculated. EC and U.S. protection rates are calculated for the year 1986, except for some cases where the year 1985 was used due to lack of more recent data. The results of these estimations are reported in Annex Table 3.

Two methods are used to derive the protection rates. In the case of price support programs that directly lead to budget expenditures or budget receipts (deficiency payments, variable import levies, export subsidies, etc.), government spending data are used to calculate the corresponding protection rates. For policies such as import or production quotas where the gap between domestic and world prices is not reflected by budget expenditures, protection rates are generally approximated by a ratio of domestic to border prices.

IV. MAIN RESULTS OF HARMONIZATION OF EC AND U.S. POLICIES

It is out of the scope of this paper to analyze in detail the supply demand, trade, price, etc., changes for each country--product--option combination. Only the essential effects on selected policy targets are summarized in Table 3.

A. Own Effects and the Economics of Harmonization (first row; first column)

When EC moves alone toward Option 3, quite significant changes occur in both the domestic and the world markets. Option 1 (0,1) grain surpluses disappear in the EC, which drives world prices up by over 5 percent. The tariff on oilcakes and grain substitutes, together with the cut in pork and poultry prices, depress the demand for imported feed and world prices of oilcakes and substitutes drop, particularly for the latter which are mainly by-products. As Option (0,1) involves some offsetting factors (cheaper grains but more expensive cakes and substitutes, limited animal sector expansion) trade and income effects are not very large. Budget savings are significant.

Option (0,2) brings about the largest changes from EC's point of view because the animal sector is deeply affected. As a consequence feed demand in the EC is driven further down and world prices for cakes and grain substitutes drop sharply, while the price of cereals recedes from the level reached in Option (0,1). The costs of grain and oilseeds programs increase somewhat from step 1 as the cut in animal production has restored the grain surplus. Huge EC budget savings take place on the costly beef and dairy market regimes as the EC moves from a surplus to a net importer position. These adjustments drive world prices up drastically for these two products. Incomes suffer a steep decline (minus 16 billion ECU) and the trade balance deteriorates significantly. Consumers gain up to 11 billion ECU and overall welfare improves by about 5 billion.

Table 3 : Summary of result of harmonization effects on selected indicators(1)

US option	EC option	0 billion ECU	world price change %	1 billion ECU	world price change %	2 billion ECU	world price change %	3 billion ECU	world price change %
				BS 2.89		BS 10.01		BS 10.24	
				TS -1.45		TS -6.50		TS -6.82	
GRA		EC		VA -2.58	5.40	VA -16.11	3.70	VA -18.18	3.70
VEP				TT 0.15	-2.40	TT 0.28	-5.50	TT 0.29	-5.50
GSU				CS 3.00	-10.50	CS 10.84	-16.80	CS 13.08	-16.80
BEE	0			WG 3.31	-1.70	WG 4.74	7.20	WG 5.14	7.20
P&P				BS 1.75	-0.10	BS 1.34	-0.80	BS 1.32	-0.80
MIL				TS 0.23	0.40	TS -0.08	20.00	TS -0.08	20.00
SUG				VA -1.29	-0.03	VA -1.28	-0.05	VA -1.27	3.90
		US		TT 0.43		TT 0.28		TT 0.28	
				CS -0.30		CS -0.07		CS -0.07	
				WG 0.16		WG -0.01		WG -0.02	
		BS -0.06							
		TS 0.02							
GRA		VA 0.09	0.40	VA -2.44	5.90	VA -16.00	4.20	VA -18.07	4.10
VEP		TT 0.05	-1.60	TT 0.18	-4.00	TT 0.34	-7.10	TT 0.34	-7.10
GSU		CS 0.02	-0.35	CS 3.00	-10.75	CS 10.84	-17.05	CS 13.08	-17.05
BEE	1	WG 0.05	-0.40	WG 3.38	-2.10	WG 4.81	6.80	WG 5.22	6.80
P&P		BS 4.74	-0.10	BS 6.49	-0.30	BS 6.10	-1.00	BS 6.09	-1.00
MIL		TS 0.14	-0.80	TS 0.35	-0.05	TS 0.07	19.40	TS 0.06	19.40
SUG		VA -3.70	-0.10	VA -5.06	-0.17	VA -5.01	-0.20	VA -5.00	3.70
		TT -0.03		TT 0.39		TT 0.27		TT 0.27	
		CS 0.00		CS -0.29		CS -0.06		CS -0.06	
		WG 1.03		WG 1.14		WG 1.03		WG 1.03	
		BS 0.34							
		TS 0.36							
GRA		VA 0.04	-1.60	VA -2.25	3.70	VA -15.84	2.50	VA -17.91	2.40
VEP		TT 0.56	-3.20	TT 0.80	-5.60	TT 0.34	-8.40	TT 0.35	-8.40
GSU		CS 0.19	-2.20	CS 3.00	-12.20	CS 10.84	-18.40	CS 13.08	-18.40
BEE	2	WG 0.57	1.25	WG 4.05	0.20	WG 4.87	5.50	WG 5.28	5.50
P&P		BS 6.44	-0.90	BS 8.06	-1.70	BS 7.43	-1.90	BS 7.42	-1.90
MIL		TS -2.34	16.45	TS -2.42	16.70	TS -2.17	39.30	TS -2.17	39.30
SUG		VA -7.62	-0.40	VA -9.13	-0.50	VA -8.35	-0.40	VA -8.34	3.50
		TT -0.56		TT -0.13		TT -0.73		TT -0.74	
		CS 3.90		CS 4.01		CS 2.88		CS 2.88	
		WG 2.72		WG 2.94		WG 1.96		WG 1.96	
		BS 0.35							
		TS 0.39							
GRA		VA 0.05	-1.70	VA -2.23	3.60	VA -15.82	2.40	VA -17.89	2.40
VEP		TT 0.62	-3.60	TT 0.83	-6.00	TT 0.38	-8.70	TT 0.37	-8.70
GSU		CS 0.19	-2.10	CS 3.00	-12.10	CS 10.84	-18.30	CS 13.08	-18.30
BEE	3	WG 0.59	1.25	WG 4.08	0.20	WG 4.90	5.45	WG 5.29	5.45
P&P		BS 6.79	-0.90	BS 8.41	-1.80	BS 7.78	-1.90	BS 7.73	-1.90
MIL		TS -2.81	16.40	TS -2.89	16.70	TS -2.64	39.30	TS -2.66	39.30
SUG		VA -8.55	3.70	VA -10.07	3.70	VA -9.26	3.70	VA -9.28	7.90
		TT -0.61		TT -0.18		TT -0.78		TT -0.80	
		CS 5.05		CS 5.15		CS 4.02		CS 4.03	
		WG 3.28		WG 3.49		WG 2.51		WG 2.48	

(1) The numbers correspond to changes from the base situation (0,0)

BS = Budget saving ; TS = Trade surplus ; VA = Value added ; TT = Terms of trade effects ; CS = Cons. surplus ; WG = Welfare gain
GRA = Grains ; VEP = Vegetable proteins ; GSU = Grain substitutes ; BEE = Bovine meat ; P&P = Pork and poultry ; MIL = Milk ;
SUG = Sugar.

When Option 3 is implemented in the EC, world prices for sugar rise (4 percent) but not much happens on the budget, although a significant transfer takes place from producers to consumers (part of the rent on the A quota).

Altogether, our results suggest that policy harmonization in EC up to Option 3, greatly alters world price ratios. First, between feed grains and other feed ingredients; second, between feeds and livestock products. Sugar prices do not respond much due to the sizeable rent on the EC quota. For the EC, Option 2 carries the largest implications for both the European farm sector and for world markets. Noticeably, when the EC undertakes such a reduction of the animal sector, world prices of grains and other feeds are depressed, and the economics of harmonization appear dominated by the swinging effects between Option 1 and 2 due to the major feed-livestock linkages in European agriculture.

While Option 2 brings about the largest changes to EC when it moves alone, it is option 1 which produces the largest effects on the U.S. when the U.S. moves alone as well: nearly 5 billion ECU budget savings and about 4 billion loss in U.S. farm income. World prices are not much altered since participation rate almost offsets the effects of the target price cut. In Option (2,0) the U.S. lowers dairy prices, and imports are allowed at the cost of a levy. Significant budget savings occur on domestic and foreign donations of dairy products. Since grain exports increase as a result of smaller feed demand, the crop programs cost more than in Option (1,0), partly offsetting the savings made on dairy. This option brings about large transfers between farm income and consumers (about 4 billion ECU). World prices are affected mainly in the case of

dairy products (16 percent), feed-to-dairy products price ratios are deeply altered and feeds also become somewhat cheaper relative to beef.

In Option (3,0) the U.S. would cut sugar support price and allow sugar imports to flow-in with the relevant tariff. No large budget saving occur, but again, significant transfers take place from producers to consumers. World prices move up by about 4 percent, an amount similar to the effect of EC sugar price cut.

When each country harmonizes separately world prices are significantly altered and often in the same direction. When both countries move in concert, world price changes[7] tend to cumulate, particularly for animal products, non-grain feeds and sugar, but they tend to offset each other in the case of grains. These world price changes are the major components in the interactions between the two countries as suggested by the review of the cross effects.

B. Cross Effects and Simultaneous Harmonization Results

In view of the hot debates and war trade threats between the EC and the U.S., one might expect that cross effects of policy changes between countries would be sizeable and that simultaneous harmonization would look much more attractive than isolated policy changes. It hardly seems to be the case except in one instance: the U.S. grain program. The main aspects of interactions between the EC and the U.S. in the harmonization context can be summarized as follows:

(1) Cross-country effects of policy changes are smaller than domestic effects. This is in line with the observation that domestic policies

[7]World price changes do not exactly add up as some changes of policy instruments occur along the way.

rather than foreign policies account for the larger part of farm sector problems.

There are several reasons for that to be expected in spite of the sometimes drastic world price changes. First, part of the adjustment is absorbed by the rest of the world. Second, EC and U.S. policies tend to insulate domestic prices (with a few exceptions). Third, domestic changes have both volume and price effects while foreign policies have only world prices effects on the budget. And last, since protection levels are fairly high in the reference period, the absolute magnitude of world price changes are smaller than the domestic ones for similar percentage variations.

The implications of these results are that domestic forces will probably matter more than foreign pressures, in the adjustment process of the EC and the U.S. farm policies.

(2) EC's action as defined here, has more influence on the U.S. than the converse for most indicators. This is particularly relevant for budget and farm income. The main reason lies in the U.S. grain program cost which is sensitive to world prices because of the deficiency payment system. The U.S. budget benefits from EC's action but farm income is hurt because of more expensive feed grains and of cheaper soybean prices. U.S. action has little effect on EC's budget (first column Table 3) except through better world prices for milk which brings some savings partly offset by lower prices for grains and cakes.

(3) Cross effects of EC on the U.S. tend to weaken as EC's harmonization is completed, but the converse is not true. This is mainly due to the receding demand for feeds in the EC in Option 2 which restores EC's position as a grain exporter. This positive contribution of the

action of the EC to the U.S. budget would even decrease faster if the soybean loan rate had been pegged in the U.S. options, since world prices for cakes dropped by more than 5 percent in Option (0,3).

(4) Cross effects on the budget tend to fade when harmonization is carried simultaneously, they may even change sign in the case of the U.S. influence on the EC. The cross effect in the first row and first column are smaller to the ones occurring along the diagonal of Table 3, in spite of wider and mostly cumulative world price changes. Clearly, the reason is that as harmonization makes progress, protection levels and/or exportable surpluses become smaller, making one country's budget less sensitive to world price changes due to the partner's action (see Figure 2).

Overall, if emphasis is placed on budget costs, the U.S. might prefer the EC to move to Option 1 and stay there, but the EC cannot afford to adjust only the crop sector. The meat and dairy industries also have to be harmonized to capture the largest saving potentials. But then the benefit for the U.S. tends to decline and the advantages of the EC moves becomes less attractive from the U.S. point of view. If budget savings were the only policy targets both countries would then move to Option 3. But, if the partners would focus on other policy targets, other combinations of options would then become more likely as illustrated in Table 4.

Table 4. Policy Targets and Possible Equilibrium Options

		EC Chooses Option			
		0	1	2	3
U.S. Chooses	0	Farm Income			Terms of Trade
	1	U.S. Trade EC Trade			EC Budget U.S. Trade
	2				
	3	U.S.Budget EC Trade			Consumer surplus, Budget, Welfare

Figure 2. Bilateral versus Single Harmonization

Fig. 2a: EC Budget

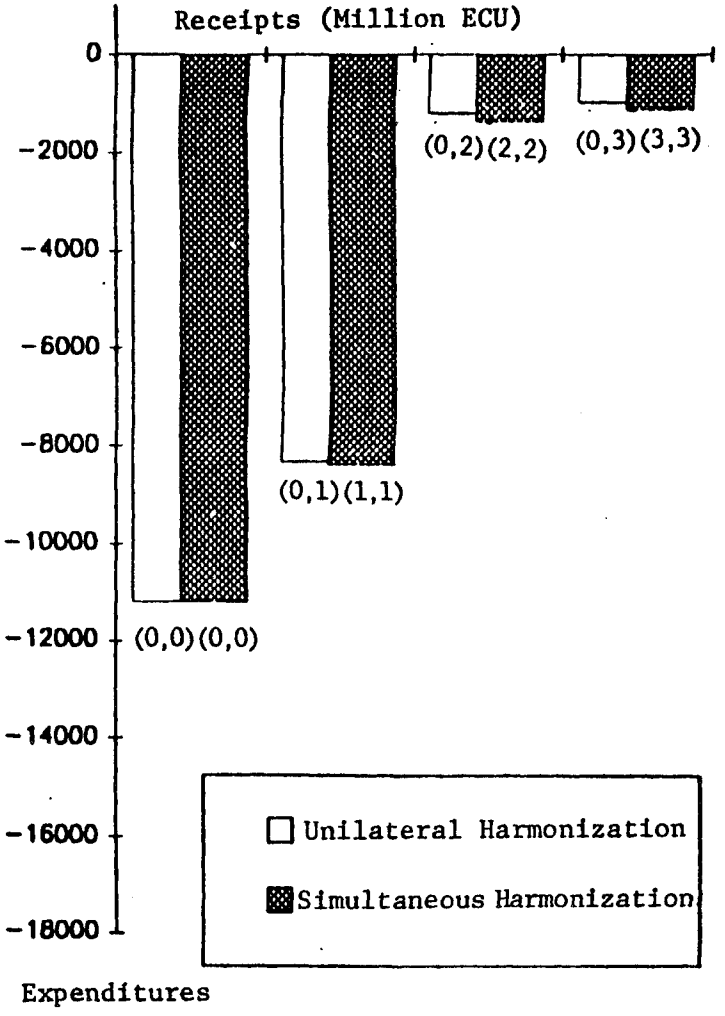
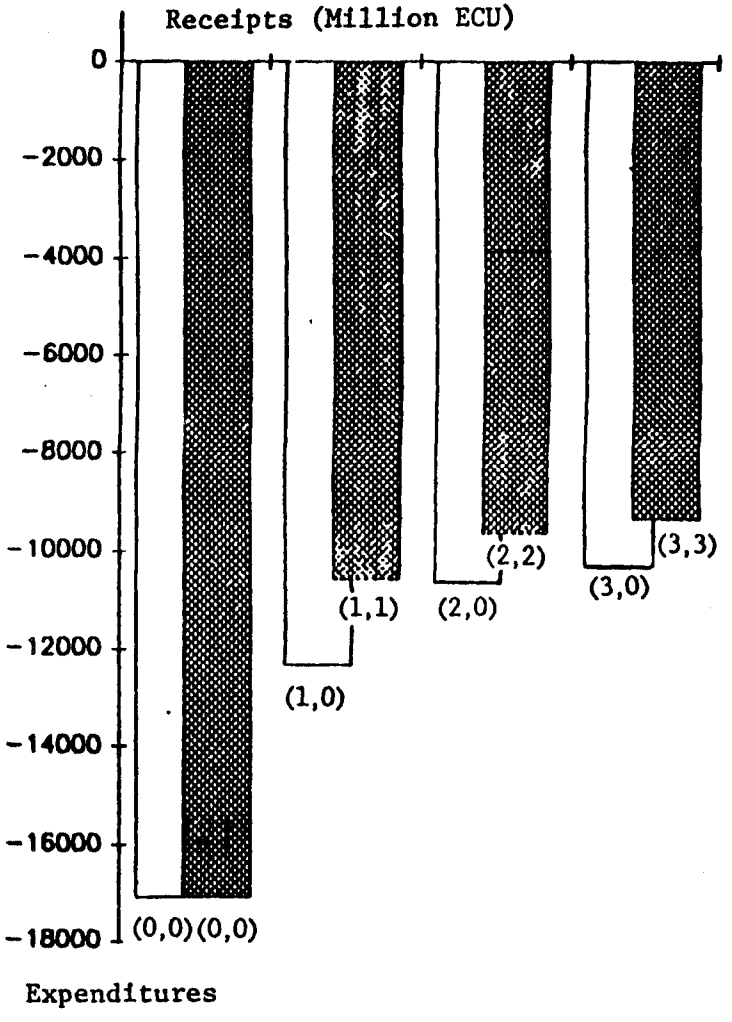


Fig 2b: U.S.A. Budget



5. DISCUSSION - CONCLUSION

The interpretation of these results is made bearing in mind that the various effects have been simulated in a comparative static framework and cannot be viewed as projections. In particular, the absence of the time dimension and of technical progress may lead to misinterpretation if the harmonization steps are just transposed in a dynamic context without caution. For example, if enough time is allowed, technical progress may offset price cuts and income would not actually fall compared to now, but it would fall compared to a no-policy change reference.

This aspect is also important for the interactions between country policies. For example, Option 2 in EC induces a trade reversal for milk and beef, which makes the U.S. action contribute negatively on the EC budget (lower levy proceeds); such an adverse effect would not occur if EC does not become an importer (as in the first column in Table 3, which would likely be the case if the price cut is spread over several years).

Another issue is the sensitivity of the results of the analysis to the parameters of the model. The sensitivity cannot be discussed in general but only with respect to issues. Income and consumer effects are probably not very sensitive to most parameters and particularly to those of the rest of the world. The latter are important for world price reactions. They seem to be generally larger or in line with results of other studies (OECD, 1987; 1986) but they can be sensitive to the assumed parameters for the rest of the world for which a satisfactory empirical basis is lacking. Some particular EC-U.S. interactions are sensitive to the world price response, particularly since the balance of many offsetting components is small in most cases. As the U.S. budget is sensitive to EC's policy

changes affecting grains, world price response of grains is an important assumption.

One may think that world prices would react more, particularly in the short run, increasing the magnitude of the interactions, but if the rest of the world parameters are meant to be relevant for the shorter run, the domestic parameters should be adjusted down accordingly and supply considered as inelastic. One may also consider that world markets are segmented due to imperfect competition and that price would be more volatile than reflected in such a price equilibrium model. But, the contemplated policy adjustments are relevant to the longer run where trade flows can adjust rather easily if outlet opportunities become available (as the grain substitutes problem of the EC seems to confirm).

Some particular results may then be sensitive to assumption. However, the conclusion that domestic policies are more important than the partner's policies seems particularly robust, as well as the greater influence of EC on the U.S. budget than the converse, mainly because of the crop deficiency payment scheme, which is less insulating than most other U.S. and EC farm programs.

With these qualifications in mid and if budget savings are given a great importance, the case for cooperation of both partners in adjusting their policies simultaneously appears to be rather clear and the fact that mutual benefits are larger at the beginning of the process may help initiate negotiations in a constructive spirit.

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Annex Table 1

a) EC supply and derived demand elasticities

		Output Prices								Variable input prices		
		GRA	VEP	GSU	BEE	P&P	MIL	SUG	ROA	GRA	VEP	GSU
	GRA	0.73	-0.01	-0.00	-0.06	-0.04	-0.06	-0.07	-0.23	0.01	0.00	0.00
	VEP	-0.20	0.89	0.00	-0.06	-0.04	-0.09	-0.07	-0.15	0.00	0.00	0.00
	GSU	-0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Output	BEE	-0.08	-0.00	0.00	0.76	-0.04	0.19	-0.02	-0.15	-0.11	-0.05	-0.05
	P&P	-0.04	-0.00	0.00	-0.03	1.93	-0.04	-0.01	-0.13	-0.83	-0.11	-0.18
	MIL	-0.06	-0.00	0.00	0.14	-0.04	0.97	-0.01	-0.26	-0.11	-0.06	-0.06
	SUG	-0.32	-0.01	0.00	-0.06	-0.04	-0.04	0.90	-0.14	0.00	0.00	0.00
	ROA	-0.12	-0.00	0.00	-0.06	-0.06	-0.15	-0.01	0.69	0.00	0.00	0.00
	GRA	-0.02	0.00	0.00	0.13	1.05	0.17	0.00	0.00	-0.97	0.02	0.02
Input	VEP	-0.02	0.00	0.00	0.19	0.53	0.32	0.00	0.00	0.06	-0.62	-0.08
	GSU	-0.02	0.00	0.00	0.19	0.84	0.34	0.00	0.00	0.06	-0.08	-0.81

b) US supply and derived demand elasticities

		Output Prices								Variable input prices		
		GRA	VEP	GSU	BEE	P&P	MIL	SUG	ROA	GRA	VEP	GSU
	GRA	0.46	-0.03	-0.00	-0.04	-0.01	-0.02	-0.00	-0.06	0.00	0.00	0.00
	VEP	-0.28	0.71	0.00	-0.04	-0.01	-0.04	-0.02	-0.09	0.00	0.00	0.00
	GSU	-0.11	0.00	0.27	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Output	BEE	-0.06	-0.01	0.00	0.60	-0.05	-0.02	-0.00	-0.12	-0.10	-0.01	-0.00
	P&P	-0.03	-0.00	0.00	-0.08	1.09	-0.06	-0.00	-0.11	-0.36	-0.13	-0.02
	MIL	-0.06	-0.01	0.00	-0.04	-0.08	0.84	-0.00	-0.22	-0.16	-0.02	-0.01
	SUG	-0.07	-0.06	0.01	-0.08	-0.05	-0.04	0.64	-0.11	0.00	0.00	0.00
	ROA	-0.11	-0.02	0.00	-0.16	-0.09	-0.15	-0.01	0.74	0.00	0.00	0.00
	GRA	0.00	0.00	0.00	0.21	0.47	0.17	0.00	0.00	-0.51	0.01	0.00
Input	VEP	0.00	0.00	0.00	0.06	0.65	0.08	0.00	0.00	0.04	-0.49	-0.01
	GSU	0.00	0.00	0.00	0.14	0.49	0.25	0.00	0.00	0.04	-0.05	-0.52

GRA = Grains
VEP = Vegetal Proteins
GSU = Grains substituts
BEE = Beef
P&P = Pork and Poultry
MIL = Milk
SUG = Sugar
ROA = Rest of agriculture

Annex Table 1 (Cont^{d})

Direct and cross price elasticities of final demand

EC	Prices						
Grains	-0.40	0.00	0.00	0.02	0.02	0.02	0.01
V.Prot.	0.00	0.00	0.00	0.00	0.20	0.10	0.00
Subs	0.00	0.00	0.00	0.10	0.20	0.10	0.00
Beef	0.01	0.00	0.00	-0.70	0.20	0.04	0.00
P&P	0.01	0.00	0.00	0.23	-0.60	0.00	0.00
Milk	0.01	0.40	0.00	0.05	0.00	-0.28	0.00
Sugar	0.01	0.00	0.00	0.00	0.00	0.00	-0.33

US	Prices						
Grains	-0.40	0.00	0.00	0.02	0.02	0.02	0.01
V.Prot.	0.00	0.00	0.00	0.00	0.20	0.10	0.00
Subs	0.00	0.00	0.00	0.10	0.20	0.10	0.00
Beef	0.01	0.00	0.00	-0.70	0.30	0.04	0.00
P&P	0.01	0.00	0.00	0.20	-0.60	0.00	0.00
Milk	0.01	0.04	0.00	0.05	0.00	-0.40	0.00
Sugar	0.01	0.00	0.00	0.00	0.00	0.00	-0.25

Annex Table 2

Rest of the world price elasticities

	Supply	Demand
Grains	0.45	-0.60
V.Prot.	0.55	-0.20
Subs	0.17	-0.13
Beef	0.50	-0.60
P&P	0.50	-0.50
Milk	0.45	-0.35
Sugar	0.55	-0.20

Annex Table 3

Protection coefficients and world prices

	EC			US			Rest of the world
	Product	An.Feed	Oth.Uses	Product	An.Feed	Oth.Uses	World prices
Grains	1.78	1.80	1.80	1.56	1.10	1.10	100.00
V.Prot.	1.95	1.00	1.00	1.10	1.00	1.00	164.00
Subs	1.00	1.00	1.00	1.00	1.00	1.00	120.00
Beef	1.75	1.75	1.75	1.05	1.05	1.05	2000.00
P&P	1.20	1.20	1.20	1.00	1.00	1.00	1280.00
Milk	1.94	0.96	1.80	1.80	1.80	1.69	143.00
Sugar	2.70	2.70	2.70	2.20	2.20	2.20	200.00