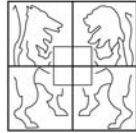GROUPE D'ECONOMIE
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French Agriculture and Processed Foods in the Doha Round

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Executive Summary

OVERVIEW: We examine agricultural liberalization in the context of the Doha Round, and its implications for the French economy. We estimate that agricultural liberalization would yield a significant boost to French national income of up to euro 18 billion annually in the long-run. It would also provide a substantial boost for the French processed foods sector. For agricultural production, the results are somewhat mixed, with positive and negative elements. While there will be erosion of quota rents in dairy and sugar, production levels themselves can be sustained in a liberal trade regime. Liberalization also yields increased production in horticulture and in intensive livestock. On an output basis, the two sectors that do take an output hit are cereals and livestock. However, Overall, the impact of agricultural liberalization under the Doha Round would be positive for France, and generally for Europe. For France, the largest set of gains from agricultural liberalization follows from the elimination of remaining domestic support measures.

BACKGROUND: The current round of agricultural negotiations was scheduled in the Uruguay Round Agreement on Agriculture (URAA), and negotiating parameters (tariffs, tariff-rate-quota levels, subsidy commitments, etc.) must be viewed in the context of URAA commitments. The system that has emerged is complex and similar to arrangements in the textile and clothing sectors, featuring a mix of bilaterally allocated tariff-rate-quotas (with associated quota rents), tariffs, and subsidies. Viewed in conjunction with industrial protection, the basic pattern is that the industrial countries protect agriculture and processed food, while protection in developing countries is more balanced though higher in its focus on food and non-food goods.

The market access negotiations are concerned with the web of subsidies, taxes, and quantity regulation that pervades agricultural markets. It is proving a very difficult issue in the current Doha Round of negotiations. The EU pressed for an explicit recognition of this WTO round as one to be focused on developing country issues. Yet, despite the rhetoric, the EU has hesitated to seriously consider developing country demands for agricultural liberalization. On June 26, 2003, the EU Ministers of Agriculture adopted a reform of the Common Agricultural policy (CAP) introducing a partial decoupling. However, based on

the existing limited information, the reform appears timid, uncertain and easily reversible.

METHOD and RESULTS: In this paper, we employ a computational model of the world economy to explore the impact of possible WTO-based agricultural liberalization on French agriculture. This includes primary agriculture, as well as the processed foods sector. Our baseline includes Agenda 2000 reforms and EU enlargement.

The study focuses on two sets of scenarios. The first is a partial liberalization scenario, where all trade instruments in agriculture and processed foods (import taxes and export subsidies) are reduced by 50%. This involves a 50% reduction in primary agricultural and tariffs and export subsidies, and a 50% reduction in OECD domestic support for agriculture. The second scenario simply involves full elimination of all trade barriers in agriculture. We also place these effects in the context of overall liberalization (agriculture, manufactured goods, and services), again including both partial and full liberalization.

Under both scenarios, production in France falls in cereals and livestock. However, the overall picture is more mixed. Production in the quota regulated dairy and sugar sectors does not change because production stays on quota and quota rents decline but remain positive. As such, there is enough room in the current system to absorb the output impact of liberalization in these sectors through a drop in quota rents rather than output. (This finding is consistent with other recent studies of the EU dairy and sugar regimes). The processed food sector in France does quite well, especially over the long-run. This is because of several reasons. While the average tariff on processed food in the EU equals a significant 23% of the value of the product, processed food products exported from the EU face an even higher barrier: 33%. In addition, import protection in the EU means that processed food firms in France have higher costs than their overseas competition. In addition, the characteristics of the industry (scale economies, tremendous competition, and product differentiation) tend to reinforce the geographic concentration of production. Because of the size and competitive position of the French sector in Europe, France is in a position to expand her processed foods production substantially under the new regime. Essentially, agricultural liberalization gives French food products a competitive boost on world markets.

Overall, the impact of agricultural liberalization under the Doha Round would be positive for France, and generally for Europe. For France, the largest set of gains from agricultural liberalization follows from the elimination of remaining domestic support measures. These yield an estimated initial gain of between euro 2.6 and 4.1 billion annually. With future growth and investment, this expands to between euro 8.1 and 15.5 billion per annum. In total, we project a gain from agricultural liberalization for the French economy of between euro 3.8 and 7.2 billion per annum in the short-run and between euro 10.7 and 18.3 billion per annum in the long-run. On the export side, horticulture and intensive livestock exports rise by roughly 7 to 12 percent and 10.5 to 14 percent respectively in the short run and long-run with partial liberalization, while processed food exports expand by between 40 to 50 percent. Dairy exports and other agriculture exports also increase in the range of 8 to 10 percent, while sugar and cattle exports both fall by roughly 8 to 9 percent.

French Agriculture and Processed Foods in the Doha Round[1]

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ABSTRACT: We employ a model of the world economy to explore the impact of liberalization on French agriculture, including primary agriculture and the processed foods sector. Our baseline includes Agenda 2000 reforms and EU enlargement. Overall, the impact would be positive for France, and generally for Europe. The largest set of gains from agricultural liberalization follows from the elimination of remaining domestic support measures. Protection of cereals and cattle production has been at the expense of processed foods, horticulture, and intensive livestock production. Rationalization can hence give a significant competitive boost to some French agricultural and processed foods sectors.

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1. Introduction

The current round of agricultural negotiations was scheduled in the Uruguay Round Agreement on Agriculture (URAA), and negotiating parameters (tariffs, tariff-rate-quota levels, subsidy commitments, etc.) must be viewed in the context of URAA commitments. The system that has emerged is complex and similar to arrangements in the textile and clothing sectors, featuring a mix of bilaterally allocated tariff-rate-quotas (with associated quota rents), tariffs, and subsidies. Viewed in conjunction with industrial protection, the basic pattern is that the industrial countries protect agriculture and processed food, while protection in developing countries is more balanced though higher in its focus on food and non-food goods.

The market access negotiations are concerned with the web of subsidies, taxes, and quantity regulation that pervades agricultural markets. It is proving a very difficult issue in the current Doha Round of negotiations. The EU pressed for an explicit recognition of this WTO round as one to be focused on developing country issues. Yet, despite the rhetoric, the EU has hesitated to seriously consider developing country demands for agricultural liberalization.

In this paper we explore the likely economic effects of the new WTO Doha round for French agriculture, including both primary agriculture and processed food production. In addition to basic market access in primary and processed foods, we also highlight the importance of market structure and investment effects. We work with a policy benchmark including China's accession to the WTO, the Agenda 2000 reforms to the CAP, enlargement of the EU, and recent EU FTAs. From this starting point, we examine the impact of further multitaleral liberalization in agriculture in the context of Doha. In addition, we explore these effects in the context of market access liberalization in industrial tariffs, liberalization in services trade, and trade facilitation measures.

The paper is organized as follows: Section 2 outlines the policy landscape and develops the liberalization scenarios for the subsequent quantitative analysis. Section 3 then describes briefly the modeling framework used. Section 4

discusses the results of our liberalization scenarios, with emphasis on French agriculture.

2. The policy benchmark and scenarios

a. The French economy

Table 2.1 below presents a broad overview of the French economy. This includes actual production value shares (i.e. adjusted for subsidy payments), as well as trade shares. It also presents the pattern of import protection afforded to sectors in the French economy vis-à-vis extra-EU trade, and the pattern of protection confronting French exports outside the EU. In terms of import protection, the average level of protection afforded to various sectors in France is roughly 3 percent. Note that this includes underlying preferential trade as well as MFN-trade. Import protection for extra-EU trade is discussed with respect to Figure 4-1 below. Sugar receives protection an order of magnitude higher (roughly 38 percent), while cereals receives twice the average rate of protection and cattle production 3 times the average, at 8 percent and 11 percent respectively. Processed foods receives a slightly higher than average rate of protection, 5 percent versus the economy-wide 3 percent. On the export side, the French economy faces an average rate of protection against her exports of roughly 4 percent. However, the pattern is highly biased against processed food exports (12 percent), dairy (22 percent), and intensive livestock (19 percent). In terms of production value shares, primary agriculture totals roughly 5.1 percent of output, 6 percent of exports, and 4.7 percent of imports. The processed food sector accounts for an additional 3.1 of output, 4.7 of exports, and 4.4 percent of imports. In terms of self-sufficiency, the French economy produces roughly 120 percent of domestic consumption. France produces 200 percent of domestic consumption in grains and 130 percent of domestic production in sugar. The largest production and trade shares are outside of agriculture, concentrated in chemicals, machinery and equipment, and services.

b. Scenario definitions

The core of our analysis is structured around a set of scenarios. These scenarios are based on alternative liberalization approaches for agriculture, manufactured goods, and services trade. They are meant to illustrate the implications of alternative

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approaches to market access liberalization in the context of Doha. They are stylized rather than exact representations. In part, this is because we are working with an aggregate model (i.e. we do not model trade at the 6-digit HS level), and as such detailed treatment of all product-specific proposals is simply impossible. In addition, the actual market access modalities remain to be worked out. In agriculture, domestic support may or may not be affected, developing countries may or may not have to liberalize, and certain politically sensitive sectors may yet again escape from meaningful liberalization. Our scenarios are themselves decomposed into different components, related to specific sets of countries and specific sectors and instruments. This offers the advantage of allowing us (or the reader) to construct rough representations of hybrid liberalization experiments later, since individual components can be taken from different scenarios and combined.[2]

Table 2-1

The Structure of the French economy

	Output shares	Export shares	Import shares	Trade-weighted ad valorum import protection	Trade-weighted ad valorum protection against exports	Self-sufficiency (domestic output share in total use)
Cereals	0.4	1.5	0.2	8	6	2.1
Horticulture	0.7	0.8	1.8	4	7	0.9
Sugar	0.3	0.4	0.1	38	7	1.3
Intensive Livestock	1.3	1.0	0.7	2	19	1.0
Cattle (beef)	0.8	0.8	0.7	11	6	1.0
Dairy	1.4	1.2	0.7	5	22	1.1
Other primary agriculture	0.2	0.3	0.6	1	1	0.9
Processed foods	3.1	4.7	4.4	5	12	1.1
Textiles and clothing	1.5	4.3	7.1	4	9	0.3
Extraction	0.2	0.2	5.3	0	3	0.2
Chemicals, rubber, plastics	5.8	14.2	12.7	1	2	1.1

[2] Technically, decomposition of general equilibrium-related effects of policy scenarios exhibits path dependence, meaning that the decomposition can be sensitive to the ordering of the elements of the experiment set. The impact of a particular instrument is also sensitive to the other members of the set. We employ a linear decomposition method in this paper that does not exhibit path dependence (Harrison et al 2000). As such, individual experiment elements are roughly additive.

Machinery and equipment	15.4	42.0	40.0	1	2	1.1
Other industry	6.1	6.9	7.8	0	2	1.0
Trade services	8.9	2.4	1.8	6	2	1.0
Transport services	4.8	5.9	7.2	8	8	1.1
Business services	16.3	6.3	6.0	10	2	1.0
Other services	32.9	7.0	3.1	12	3	1.0
Total	100.00	100.00	100.00			
Average				3	4	1.0

source: input-output tables and protection data from GTAP version 5.2 database. The input-output benchmark is 1997.

The stage for the current agriculture negotiations was set by the Uruguay Round Agreement on Agriculture (URAA). One key difference from industrial products is that essentially all agricultural tariffs are bound. However, in both industrial and developing countries, there is a large degree of binding overhang resulting from "dirty tariffication" or the use of "ceiling bindings" (Hathaway and Ingco 1996). The system that has emerged is complex.

The URAA had stated goals of no backsliding and modest liberalization. However, negotiating parties (generally the relevant agriculture ministries) gave considerable leeway to themselves with regard to selection of the appropriate reference period from which to measure export subsidy reductions. In addition, the move to a price-based system for protection has, in many cases, been subsumed into an effective adoption of explicit quotas. The disciplines on domestic subsidies have also been weakened by a relatively soft definition of the AMS vis-à-vis individual subsidies and the scope for reallocation of expenditures within the AMS. (See Tangermann 1998 for discussion.) Commitments not to erode current market access were meant to limit the scope for increased protection through dirty tariffication. As the name implies, dirty tariffication involved violations of the spirit, if not the letter, of the URAA text. It involved setting tariff bindings at rates far above then current effective protection rates. The practice of setting high bindings complicated the problem of measuring the impact of further commitments to reduce bindings. Basically, in agriculture, we are in a world that allows scope for great policy discretion and uncertainty as a result of the loose nature of the commitments made. In addition, the setting of high bound rates made possible the conversion of NTBs into even more restrictive import tariffs. This in turn made quantity disciplines necessary to avoid backsliding. Despite the goals of subsidy reductions and a shift toward price-based border measures, one of the more striking

features of the regime that has actually emerged is the prominent role that quantity measures have taken in the new architecture. Basically, the agricultural trading system is complicated and still evolving. Policy measurement in this area has converged on the use of price-based measurements that emphasize the tax/subsidy equivalent of policy. (As this approach reflects available data, this is the approach we employ in this paper as well.)

To model agricultural liberalization, and to place it in the context of broader market access negotiations, we define two sets of scenarios. In the "50% Liberalization" scenario all trade instruments are reduced by 50%. This involves a 50% reduction in agricultural and industrial tariffs and export subsidies, a 50% reduction in OECD domestic support for agriculture, a 50% reduction in the tariff-equivalent of services barriers, and a partial reduction in trading costs, related to trade facilitation measures. A more detailed discussion of the scenario definitions, such as estimates for non-tariff barriers, can be found in Francois et al (2003). The second scenario simply involves full elimination of all trade barriers. Trade facilitation, based on the range of available estimates, is assumed to range between 1.5 percent of the value of trade (partial liberalization) and 3 percent (full liberalization). Both experiments are decomposed, both in terms of sectors and instruments, and also in terms of country grouping.

3.   The Model and Data

In this section we provide a brief overview of the global computable general equilibrium (CGE) model used in this study. The model is characterized by an input-output structure (based on regional and national input-output tables) that explicitly links industries in a value added chain from primary goods, over continuously higher stages of intermediate processing, to the final assembling of goods and services for consumption. Inter-sectoral linkages are direct, like the input of steel in the production of transport equipment, and indirect, via intermediate use in other sectors. The model captures these linkages by modeling firms' use of factors and intermediate inputs. The most important aspects of the model can be summarized as follows: (i) it covers all world trade and production; (ii) it allows for scale economies and imperfect competition; (iii) it includes intermediate linkages between sectors; (iv) and it allows for trade to affect capital stocks through investment effects. The last point means we model medium to long-run investment effects. The inclusion of scale economies and

imperfect competition implies agglomeration effects like those emphasized in the recent economic geography literature.

a. Model data and the benchmark

Our data come from a number of sources. Data on production and trade are based on national social accounting data linked through trade flows (see Reinert and Roland-Holst 1997). These social accounting data are drawn directly from the most recent version of the Global Trade Analysis Project (GTAP) dataset, version 5.2. (Dimaranan and McDougall, 2002). The GTAP version 5 dataset is benchmarked to 1997, and includes detailed national input-output, trade, and final demand structures. The basic social accounting and trade data are supplemented with trade policy data, including additional data on tariffs and non-tariff barriers.

The data on tariffs are taken from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules and from the UNCTAD/World Bank WITS dataset. All of this tariff information has been concorded to GTAP model sectors. Services trade barriers are discussed in Francois et al (2003). We also work with the schedule of China accession commitments (Francois and Spinanger 2001).

While the basic GTAP dataset is benchmarked to 1997, and reflects applied tariffs actually in place in 1997, we of course want to work with a representation of a post-Uruguay Round world. We also want to include the accession of China, the enlargement of the EU, and Adenda 2000 reforms as part of the baseline. To accomplish this, before conducting any policy experiments we first run a "pre-experiment" in which we do the following:

- implement the rest of the Uruguay Round tariff commitments,
- implement the ATC (textile and clothing quotas) phaseout,
- implement China's accession to the WTO,
- implement Agenda 2000,
- and Implement the pending EU enlargement.

As such, the dataset we work with for actual experiments is a representation of a notional world economy wherein we have realized many of the trade policy reforms already programmed for the next few years.

The social accounting data have been aggregated to 17 sectors and 16 regions. The sectors and regions for the 17x16 aggregation of the data are given in Table 3-1 (a more detailed mapping between the aggregated sectors and regions and the original GTAP regions and sectors is given in Francois et al, 2003).

b. Theoretical Structure

We turn next to the basic theoretical features of the model. More discussion is provided in Francois et al (2003). In all regions there is a single representative, composite household in each region, with expenditures allocated over personal consumption and savings (future consumption). The composite household owns endowments of the factors of production and receives income by selling them to firms. It also receives income from tariff revenue and rents accruing from import/export quota licenses (when applicable). Part of the income is distributed as subsidy payments to some sectors, primarily in agriculture.

On the production side, in all sectors, firms employ domestic production factors (capital, labor and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allow. Perfect competition is assumed in the agricultural sectors as indicated in Table 3.1 (notice that the processed food products sector is characterized by increasing returns to scale). In these sectors, products from different regions are assumed to be imperfect substitutes in accordance with the so-called "Armington" assumption. Production under imperfect competition is discussed below.

Table 3-1: Sectors and regions

FRA	France	CERE*	Cerals
DEU	Germany	HORT*	Horticulture & other crops
NLD	Netherlands	SUGA*	Sugar, plants and processed Intensive
REU15	Rest of EU	INTLIV*	livestock &products
CEEC	CEECs	CATLE*	Cattle & beef products
MED	Mediterannean and Middle East	DAIRY*	Milk & dairy
NAM	North America	OAGR*	Other agriculture
SAM	South America	PROCF	Processed food products
CHINA	China	TEXT	Textiles, leather & clothing
INDIA	India	EXTR	Extraction industries
HINCAS	High income asia	CHEM	Petro & chemicals

			Metal and
OASPAC	Other Asia-Pacific	MELE	electrotechnical industry
AUSNZ	Australia and New Zealand	OIND	Other industries
SAF	South Africs	TRAD	Trade services
SSA	Sub-Saharan Africa	TRAN	Transport services
			Business, financial
ROW	Rest of World	BSVC	& communnications services
			Other private and public
		OSVC	services

* denotes a competitive sector in all applications.

Prices on goods and factors adjust until all markets are simultaneously in (general) equilibrium. This means that we solve for equilibria in which all markets clear. While we model changes in gross trade flows, we do not model changes in net international capital flows. Rather our capital market closure involves fixed net capital inflows and outflows. (This does not preclude changes in gross capital flows). To summarize, factor markets are competitive, and labor and capital are mobile between sectors but not between regions.

We model manufacturing and services as involving imperfect competition. The approach followed involves monopolistic competition. Monopolistic competition involves scale economies that are *internal* to each firm, depending on its own production level. In particular, based on estimates of price-cost markups, we model the sector as being characterized by Chamberlinian large-group monopolistic competition. (For more on this approach, see Francois and Roland-Holst 1997.) An important property of the monopolistic competition model is that increased specialization at intermediate stages of production yields returns due to specialization, where the sector as a whole becomes more productive the broader the range of specialized inputs. These gains spill over through two-way trade in specialized intermediate goods. With these spillovers, trade liberalization can lead to global scale effects related to specialization. With international scale economies, regional welfare effects depend on a mix of efficiency effects, global scale effects, and terms-of-trade effects. (Again see Francois and Roland-Holst 1997). Similar gains follow from consumer good specialization.

Another important feature involves a dynamic link, whereby the static or direct income effects of trade liberalization induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, and relate to classical models of capital accumulation and growth,

rather than to endogenous growth mechanisms. Research in this area includes Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of the Uruguay Round (see for example Francois, McDonald and Nordstrom 1993, 1994) also incorporated variations on this mechanism, along with variations in market structure. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behavior. It also hinges along interactions with market structure. In the present application, we work with a classical savings-investment mechanism (discussed briefly in the appendix, and also in Francois, McDonald and Nordstrom 1997). This means we model long-run linkages between changes in income, savings, and investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

4. Results

Tables 4-1 and 4-2 below show the estimated percent change in output in France and the rest of the EU (current and enlarged), including both agriculture and processed foods. Production in France falls in cereals and livestock. However, the overall picture is more mixed. Production in the quota regulated dairy and sugar sectors does not change in the EU regions because production stays on quota and quota rents decline but remain positive. As such, there is enough room in the current system to absorb the impact of liberalization in these sectors through a drop in quota rents rather than output. The immediate impact of increased import competition is lower quota rents, and therefore lower internal EU prices. Production would only fall dramatically if quota rents were fully eroded, but we do not find this to be the case in our estimates. The lower internal prices make EU a less attractive export destination, and hence imports expand less than expected.

The processed food sector in France does quite well, especially over the long-run. This is because of several reasons. While the average tariff on processed food in the EU27 is relatively high, processed food products exported from the EU face an even higher barrier: 33%. In addition, primary agriculture import protection

in the EU means that processed food firms in France have higher costs than their overseas competition. The characteristics of the industry (scale economies, tremendous competition, and product differentiation) also tend to reinforce the geographic concentration of production in Europe in our scenarios. This leads to France expanding her processed foods production. Agricultural liberalization gives French food products a competitive on world markets.

Table 4-1: Percent change output (volume index), 50% Liberalization

	France	Germany	Netherlands	Rest of EU15	CEEC candidate countries
Cereals	-10	-12	-19	-12	2
Horticulture	4	4	-1	4	2
Sugar	0	0	0	0	-4
Intensive livestock	2	-1	1	1	1
Cattle	-8	-5	-2	-8	0
Dairy	0	0	0	0	3
Other agriculture	2	0	0	0	6
Processed foods	3	-3	8	-1	1

Table 4-2
Short-run and long-run effects on production in France (percent)

	short-run	long-run
Cereals	-10	-15
Horticulture	4	8
Sugar	0	0
Intensive livestock	2	6
Cattle	-8	-17
Dairy	0	0
Other agriculture	2	2
Processed foods	3	18

While the result for processed food is consistent with recent empirical observations on the shifting composition of agri-food trade towards more trade in processed products (Hertel et al, 1999, Berkum and van Meijl, 2001), additional explanation can also be found in the base data.

Figure 4-1 shows that the average tariff on processed food in the EU27 equals a significant 23% of the value of the product for extra-EU trade. However, processed food products exported from the EU have to overcome an even higher barrier: 33%. Consequently, a simulated tariff reduction of 50% leads to a notable reduction of import prices, both in the EU as elsewhere. Another factor contributing to the expansion of trade is the assumption of scale economies in the processed food industry. Scale economies tend to promote more regional specialisation, and therefore they lead to more trade. Outside the EU, where the Dutch and French processed food sectors expand, other regions seeing an expanding food processing industry are South America and Australia-New Zealand. All these regions have already a comparative advantage in processed food (see Francois, **Erreur! Signet non défini.**, and van Tongeren 2003) and protection encountered on their exports is relatively high.

Figure 4-1: Average import tariffs (%) on extra-EU trade (base situation)
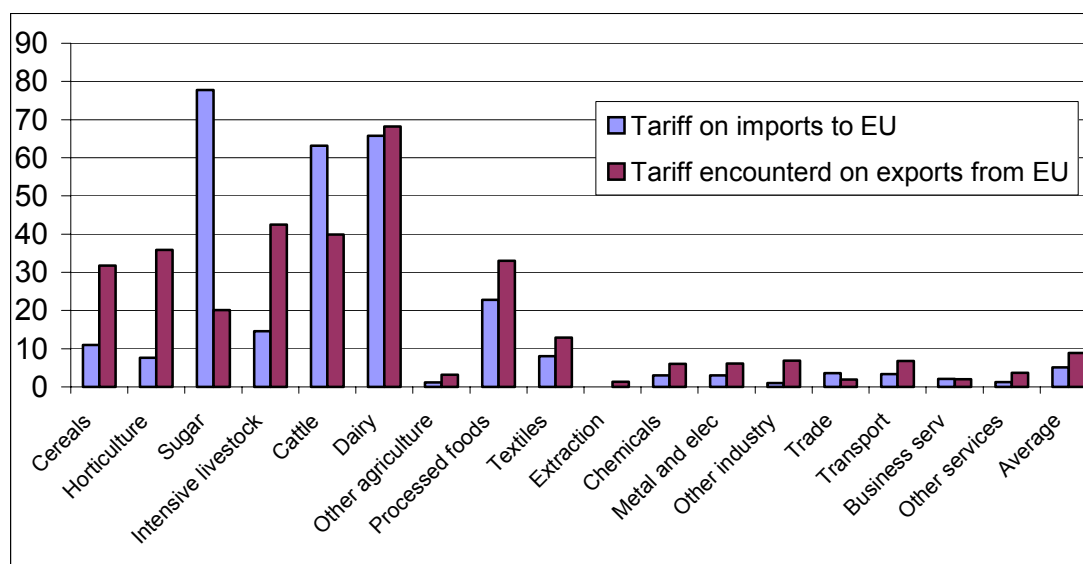
Source: GTAP database, author's calculations

Note: Tariffs are given as trade-weighted averages of *ad valorem* tariff equivalents.

Tables 4-3, 4-4, and 4-5 below provide breakdowns of the national income effects (in 2001 euros) of both partial and full agricultural liberalization.[3] For France, the largest set of gains from agricultural liberalization follows from the elimination of remaining domestic support measures.[4] These yield an initial gain of between euro 2.6 and 4.0 billion annually. With future growth and investment, this expands to between euro 8.1 and 15.5 billion per annum. In total, we project a gain for the French economy of between euro 4.1 and 7.3 billion per annum in the short-run and between euro 10.7 and 18.3 billion per annum in the long-run.

What about the bigger picture, including manufacturing and services, and also France's trading partners? Table 4-6 presents a summary of results at the global level from a full Doha Round. The table presents a breakdown of the national income effects (technically measured as equivalent variation) resulting from the various policy experiments along the lines of major sector components.

From the initial set of income effect tables, we can see that agricultural liberalization offers a more mixed set of results globally. Liberalization of domestic support in the OECD, on the other hand, is generally positive for the OECD, though with negative consequences for sub-Saharan Africa. We find that significant, though limited, liberalization yields positive results globally, and regionally for Europe, Africa, and most of Asia. However, on net agricultural liberalization is a mixed-bag, with gains in most areas from elimination of domestic support, but with more mixed results from the elimination of border measures. Static results are consistently positive if constant returns to scale (CRS) are assumed, but induced changes in investment, combined with the imperfect competition features of the model, point to negative effects over the longer-run.

In total, the picture that emerges from our analysis is one where agricultural liberalization, in the context of the Doha Round, is in the long-run interest of France. It yields significant gains to French national income of up to euro 18 billion annually in the long-run and proves a positive boost for the processed

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[3] The base GTAP dataset is benchmarked to 1997 dollar values. We have employed exchange rate and GDP deflator values to move our estimates of income effects to euros.
[4] Note that this does not preclude regional development or related payments to agricultural regions. It just means such rural development assistance is not linked explicitly to agricultural production.

foods sector. For agricultural production, the results are mixed though positive overall as well. While there will be erosion of quota rents in dairy and sugar, production levels themselves can be sustained in a liberal trade regime. Because the French economy does not have to compete with more heavily subsidized producers elsewhere in Europe, liberalization also yields increased production in horticulture and in intensive livestock. On an output basis, the two sectors that do take an output hit are cereals and livestock. However, our analysis highlights that protection of cereals and cattle production has been at the expense of processed foods, horticulture, and intensive livestock production. Rationalization in this area can give a significant competitive boost to other parts of the French agricultural and processed foods sectors.

Table 4-3

Agricultural liberalization

**Short-run and long-run impacts on France
change in national income, millions of euros annually**

	short-run effects	long-run effects
Border measures		
50% reduction	1,568	2,593
full liberalization	3,128	2,788
Domestic support		
50% reduction	2,594	8,092
full liberalization	4,080	15,549

Table 4-4

Agicultural Liberalization
Static National Income Effects, millions of euros (based on equivalent variation)

	50% liberalization of border measures			Full liberalization or border measures			OECD Domestic Support	
	Total	OECD	LDCs	Total	OECD	LDCs	Partial	Full
France	1,568	1,440	129	3,128	2,402	727	2,594	4,080
Germany	2,178	2,004	174	4,585	3,949	637	1,048	1,449
Netherlands	725	301	424	1,356	105	1,251	-15	113
Rest of EU 15	4,762	4,641	121	8,171	7,222	948	4,322	6,677
CEECs	1,607	1,079	528	4,106	1,911	2,196	-2	-191
Mediterranean	14,174	-750	14,924	20,997	-1,995	22,992	-567	-1,292
North America	2,529	1,417	1,112	4,114	1,065	3,048	2,053	3,666
South America	1,940	153	1,787	4,123	371	3,753	-144	-273
China	2,827	-353	3,180	3,352	524	2,827	-238	-545
India	714	-72	786	1,130	-193	1,323	-6	-33
High Income Asia	15,231	13,376	1,855	25,498	20,712	4,786	-476	-923
Other Asia-Pacifi	3,469	951	2,518	6,186	2,385	3,801	-80	-164
Australia-NZ	-330	-396	66	-471	-681	209	66	175
South Africa	1,187	-79	1,266	1,943	-196	2,138	-36	-108
Sub-Saharan Afr	1,316	-184	1,500	2,987	-430	3,416	-87	-234
Rest of World	-133	-408	275	164	-497	661	-174	-713
Total	53,766	23,122	30,643	91,368	36,655	54,714	8,258	11,681

note: basis is equivalent variation, under static closure.

Table 4-5

Agicultural Liberalization
Long-Run National Income Effects, millions of euros (based on equivalent variation)

	50% liberalization			Full liberalization			OECD Domestic Support	
	Total	OECD	LDCs	Total	OECD	LDCs	Partial	Full
France	2,593	2,159	434	2,788	1,528	1,260	8,092	15,549
Germany	3,214	1,615	1,600	5,247	1,449	3,799	2,318	4,699
Netherlands	1,006	557	449	359	-389	748	206	861
Rest of EU 15	4,535	4,490	45	2,965	1,012	1,953	12,204	24,192
CEECs	11,311	-1,274	12,585	17,293	-1,800	19,092	746	1,574
Mediterranean	24,508	-692	25,199	-3,293	-2,306	-988	-631	-1,485
North America	-17,341	-13,897	-3,444	-25,202	-44,111	18,909	5,983	11,776
South America	6,487	2,930	3,557	13,418	7,708	5,709	26	593
China	-3,914	6,698	-10,612	-18,544	16,137	-34,682	-484	-79
India	-760	3,966	-4,726	-25,163	9,452	-34,616	359	1,489
High Income Asia	7,544	3,627	3,917	-11,287	-17,444	6,156	158	2,011
Other Asia-Pacifi	1,813	19,863	-18,051	-40,672	38,934	-79,606	1,002	3,392
Australia-NZ	-1,125	-1,290	165	-2,587	-2,292	-295	254	731
South Africa	1,690	-208	1,898	1,181	-546	1,727	-43	-139
Sub-Saharan Afr	2,987	-99	3,086	3,725	-454	4,179	-151	-298
Rest of World	1,173	-180	1,353	1,889	317	1,573	-42	-364
Total	45,720	28,264	17,456	-77,884	7,197	-85,081	29,996	64,500

Table 4-6

Income effects of A Doha-Round, 50% Liberalization

Static National Income Effects, millions of dollars (based on equivalent variation)

	TOTAL	OECD agriculture liberalization (border measures)	OECD agriculture liberalization (domestic support)	LCD agriculture liberalization (border measures)	OECD manufactures tariffs	LDC manufactures tariffs	OECD services liberalization	LDC services liberalization	OECD trade faciitation	LDC trade facilitation
France	9,456	1,583	2,597	169	280	1,386	958	248	1,759	310
Germany	11,255	2,119	1,049	195	421	1,850	1,801	157	2,568	704
Netherlands	3,569	341	-15	624	26	531	373	105	1,052	276
Rest of EU 15	24,730	4,923	4,340	159	987	3,994	1,468	455	6,103	1,636
CEECs	5,613	1,166	10	426	694	791	352	103	973	345
Mediterranean	26,737	-723	-565	21,760	400	162	985	163	646	3,461
North America	33,295	991	2,092	1,131	2,768	5,751	5,820	685	10,169	2,918
South America	4,693	134	-140	1,469	112	-1,586	631	1,164	834	3,330
China	-2,202	273	-215	4,261	-5,447	-1,809	-14	829	-103	503
India	3,270	-60	-7	1,046	111	-972	54	1,839	314	829
High Income Asia	52,028	17,694	-503	2,188	4,270	6,841	1,764	99	14,334	3,687
Other Asia-Pacifi	13,002	1,013	-80	2,770	781	608	597	119	2,083	4,906
Australia-NZ	2,296	-443	72	60	332	266	672	24	1,000	228
South Africa	3,517	-72	-39	1,886	87	443	89	341	191	567
Sub-Saharan Afr	2,641	-151	-88	1,809	72	-141	143	29	161	810
Rest of World	19,955	-594	-174	314	628	1,225	600	101	1,609	524

note: results may differ somewhat from Tables 4-3, 4-4, and 4-5 due to differences in decomposition.

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