Winners and losers with harmonization of organic guarantee systems

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Abstract

Theoretical issues of harmonization of international organic guarantee systems - encompassing standards, certification and accreditation - are explored, after which the benefits are quantified for two commodities, wheat and coffee.

Included in the theoretical framework are the concepts of actual direct costs (certification), and indirect costs (mainly inefficient and foregone production and marketing, and consumption) for the exporting and importing countries of organic produce.

The extra welfare of harmonization in the organic wheat trade is estimated at over US$0.4 million per year (1.3 per cent of the total organic wheat trade) under conservative assumptions, and US$2 million per year (7per cent of the organic wheat trade) with less conservative assumptions. Canadian, Slovakian and USA producers, and Japanese and Swiss consumers, gain the most from this harmonization. For coffee, the welfare gain is close to US$8 million per year (over 7 per cent of the traded value of organic coffee), or more with less conservative assumptions. The major gains from harmonization in the organic coffee market go to consumers, not to producers.

Keywords:

organic agriculture harmonization standards certification accreditation trade wheat coffee

Background

Technical standards and certification procedures for organic production differ between countries (Westermayer and Geier 2003). Thus, it is inevitable that organic producers in some countries are confronted with additional costs when exporting. These additional costs reflect the requirements of the importing country that imports be produced and certified to the same or similar specifications as domestic products. They also are the reason for calls for harmonization/equivalence measures, especially by exporting countries.

International bodies concerned with developing countries, such as the Food and Agriculture Organization of the United Nations (FAO) and the UN Conference for Trade and Development (UNCTAD), are interested in harmonization issues in organic agriculture in so far as organic agriculture promotes sustainable development in those countries[3]. For the purpose of this paper the word 'harmonization' is used to indicate a move towards convergence of two organic standards and certification systems, and the recognition of this by other parties. The word is not meant to indicate guarantee systems being identical, rather, being equivalent.

Early 2002, at a meeting organized by FAO, UNCTAD and the International Federation for Organic Movements (IFOAM), the International Task Force on Harmonization and Equivalence in Organic Agriculture (ITF) was set up. The ITF then commissioned a number of papers to consider the need for, and feasibility of, harmonization. Topics included an overview of the current status of standards and conformity assessment systems in organic agriculture (Commins 2004); mechanisms that enable international trade in organic products (Bowen 2004); an analysis of existing and potential models and mechanisms for harmonization, equivalency and mutual recognition (Courville and Crucefix 2004); and the cost of non-harmonization (Wynen 2004). This last report is summarized here.

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[2] This paper is a summary of Wynen (2004), carried out during employment at UNCTAD. The report is available on: http://www.unctad.org/trade_env/ITF-organic/publications/Complete%20Harmonization%20Book%20Vol%201.pdf

[3] Also for the TBT (Technical Barriers to Trade Agreement within the World Trade Organization) international standards and harmonization are of great importance. Governments of developing countries may see assistance with the development of the organic certification system as a way of being assisted to develop the export market.

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Harmonization can be achieved in a number of ways, such as through modification of standards, certification and accreditation in importing or exporting countries, or agreement between two countries on equivalence of the existing systems. Included are the costs for the exporting and importing countries of what are here called the direct costs (certification), and indirect costs (mainly inefficient and foregone production and marketing, and costs/benefits for consumers).

The theory how net gains could occur are outlined, acknowledging that different players could gain and loose. Harmonization can decrease direct costs (for inspection and certification) and indirect costs (related to production, marketing and consumption), both for producers, consumers and other players in the marketing chain, such as processors, wholesalers and retailers. Other parties, such as some exporters and producers in importing countries could be disadvantaged by such a change. Consumers, especially in the importing countries, can be expected to gain when all effects have worked themselves through the system.

The effect of harmonization is illustrated for the case of two products: wheat and coffee. The criteria for selecting these particular crops were related to the objectives of the funding bodies, UNCTAD, FAO and IFOAM. Crops were to be chosen such that each continent was represented, and countries with different socio-economic circumstances included. As no work could proceed without data, a second criterion was data availability for the most important variables, such as export quantities and prices. A third criterion was absence of extensive regulations (such as domestic support, import and export subsidies or tariffs) that can affect marketing, as this would make analysis rather difficult – a reason for excluding sugar and bananas. Wheat is exported and imported on all continents, except Asia, and is grown mainly by large-holders. Coffee involves many small-holders, especially in Central and South America[4].

A theoretical framework

A guarantee system can apply to a product or production process, and consists of a number of components. One of them is the standards, which indicate the criteria according to which the product is measured (product) or produced (process). There then needs to be a system by which the product or producer is checked on whether the standards have been applied. This is called the certification system. A third step is the accreditation, where the certifying organization is checked on its adherence to good practices in certifying.

In many industries with standards across countries, international standardization is sought. Deshpande and Nazemetz (undated) divide the benefits and costs of standards and standardization into tangible and intangible items. However, not all of these points are necessarily valid for harmonization of a process, such as organic agriculture.

The potential effects of harmonization in the organic industry are summarized in Table 1. The extra costs of non-harmonization can be divided into different categories: administration; production; and marketing. The administrative costs relate to the standards and certification, and are treated as direct costs. The production and marketing costs are treated as indirect costs here.

Administratively, the effect of harmonization on exporting countries means that, instead of having to comply with many different standards within one country in order to be able to export to different countries, one set of standards needs to be adhered to, cutting down on certification and accreditation work, potential conflicts, errors, training and hence costs. These standards need not be identical in every country, but importers need to agree that those standards are equivalent to their own, and allow products that can be shown to have been produced according to those standards into the country.

On the production side, standards that are appropriate for local conditions while still acceptable for the importing country mean lower loss of production and lower input costs in the exporting country. Locally-appropriate standards can make the difference between being able to export or not.

[4] The inclusion of rice, grown extensively in Asia, was planned, but no work on this commodity commenced before the end of the project.

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Table 1: Potential effect of harmonization of guarantee systems in organic agriculture

Without harmonization	**With harmonization**	**Effect of harmonization**
Exporting countries		
Administration		
- Domestic market: sets own standards - Export: keeping up with a multitude of standards	Setting and updating national/regional standards	Less costs due to decrease in work, conflicts, and administrative errors
Certify according to a multitude of standards	Certify to one set of standards	Less paper work, travel, required skills
Extra training of inspectors/ evaluation officers	Training of certification personnel	Less training of certification personnel
Many layers of accreditation	Reduced accreditation	Reduced accreditation
Production		
Use of standards appropriate to local conditions	Use of foreign standards	Loss of production or increased costs due to use of inappropriate standards
Marketing		
Need for investments and operation of different storage facilities	Need for investments and operation of one storage facility	Need for less storage facilities
Delay in marketing due to paper work needed	Less delay in marketing	Less delay in marketing, as less paperwork is needed.
Chance of dependency on importer (many exporters to EU)	Less dependency on importer	More flexibility in choice of importer
Unequal treatment of exporters (e.g. exporters on the EU 3rd-country list compared with countries that are not on list)	Increased competition	More equal treatment of exporters by importing countries
Importing countries		
No need for consensus on practicalities of equivalence	Need for consensus on what is equivalence	More meetings etc.
Increased paperwork on import certificates	Decreased paperwork on import certificates	Less paperwork, lower costs of certification, lower consumer prices for organic products
Some protection of local producers	Less protection of local producers	Increased free trade (WTO consistent)
Limited choice of products and relatively high price	Increased trade, products and decreased product prices	Increased trade, product and decreased product prices

In marketing, the effects of harmonization are manifold. One effect relates to the physical need of less storage if, in a situation of no-harmonization, goods were stored before sales off the farm or on the wharfs, for example. Other effects relate to more nebulous issues, such as delays in marketing due to paperwork that is not in order and dependency on importers (due to particular regulation in the importing country). Differentiation by importers between

exporters in scrutinising imports affects competitiveness between exporters. Note that this last issue can be beneficial to some countries, and disadvantageous to others. Australia, for example, being one of the few on the EUs third-country list[5], may be disadvantaged by a more equal treatment of all exporters to the EU (see the wheat case below).

For importing countries, the benefits are not totally undivided. As harmonization means a need for agreement between parties, the process to reach agreement requires more input than when conditions for imports are dictated to the exporting country. In addition, easier access to the importing country means a decrease in marketing costs to exporters, and therefore the possibility of lower prices to consumers, also in the importing country. This is likely to be experienced as disadvantageous by domestic producers, although domestic consumers may welcome it. Increased imports also allow a greater diversity of products available to the consumer at any particular time, with out-of-season products being imported.

As organic standards in different countries do not have to be identical in order to be deemed equivalent by the trading parties, it is possible that consumers may prefer products produced according to their local standards. However, if their own certifying body has judged other standards and certification processes to be equivalent to its own, there is little reason to assume that consumers will prefer domestically certified organic goods. The exception is, of course, geographic preference, which is not related to the intrinsic organic characteristic.

Direct costs of compliance[6]

To certify organic produce for the domestic market, many countries have their own standards and certification organizations. Such a domestic certifier will usually have its own standards and local inspectors, and acceptance for certification will occur according to the report produced by the local inspector (situation 1). Exceptions are usually developing countries.

Certification for the export market is usually more complicated. Certification of the farmer by domestic organizations facilitates the domestic organic market, but it may also allow exports to the EU, the USA and/or Japan – the major importers of organic food. If the exporting country's standards and certification system is not accepted by the importing country as equivalent, foreign certifiers may be needed to facilitate exports, which tend to increase costs by adding travelling and labour costs. These foreign certifiers can either accredit a domestic certifier to do the inspections and certification for it (situation 2), or authorize it to do the inspections (situation 3). In the last case the foreign certifier receives the inspection report from the domestic certifier but the certification itself is handled by the foreign certifier - often in the country where the head-office is located. Alternatively, foreign certifiers can do the inspections themselves, that is, the inspectors are then foreigners (situation 4). A fifth option is to employ local inspectors without having an arrangement with a local certifier.

In the domestic market, certification charges are based on the local situation, such as local labour costs and cost of transport for the inspector, competitive situation with other organizations, and accreditation costs for exports such as to the EU, United States and Japan.

In Tables 2 and 3, the costs of certification by domestic certification bodies are compared for wheat and coffee, respectively. Differences in costs between countries are shown to be not all that large. Initial fixed costs in most countries stay mostly under US$500 per wheat farm, and can be considerably less for small farms. Variable costs are often around one per cent for organic sales.

These tables give some idea how the methods of certification can vary. Some countries have one and the same fee for all farms, irrespective of size (for example, USA and Canada), others differentiate in fees according to farm size. Also the issue of the ratio of fixed and variable costs is treated differently between countries. Most countries charge a fixed fee per farm, and some per hectare (such as Hungary and Slovakia). Some farms charge only fixed fees (Peru and Colombia) – apart from the original set-up cost. Most countries charge

[5] In 2002, the EU had different systems of importing organic produce from third (non-EU member) countries. By far the easiest way to export was if the country was acknowledged by the EU as having equivalence with the EU regarding organic certification. Of the countries included in this study, Argentina, Australia, Hungary and Costa Rica are on this list (Vossenaar and Wynen 2004).

[6] For more details, see Wynen (2004, Section 4.2). Some data are provided in the case studies.

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variable fees as a percentage of the returns to organic sales, but the rates are rather different. Canada charges a variable fee based on acreage.

Table 2: Domestic certification cost for organic wheat exporting countries (2002)

Exporter	Certifier	Type of farm	Annual fee ($US or %)	
			Fixed fee	Variable fees
Argentina	ARGENCERT	Average	400	0.7% of organic sales
		Small	150	1% of organic sales
Australia	NASAA	Average	282	1% of organic sales >$25,600
		Small	141	
Hungary	Biokontroll (H)	Average	7 per ha	1% of organic sales
Slovakia	Naturalis	Average	1.1 per ha	0.5 % of organic sales
USA	OCIA (Int.)	Average	380	1.1% of organic sales
Canada	OCIA	Average	410	$0.31/ha arable land

Source: Wynen (2004, Table4.4).

Table 3: Domestic certification cost for organic coffee exporting countries (2002)

Exporter	Certifier		Original cost per farm or group ($US)	Annual fee ($US or %)	
				Fixed, per farm or group	% of gross farm sales
Brazil	IBD	Average farm	150+400+300	< 0.5% of sales	0.5 to 1 %
		Farm group	100+300+300	< 0.5% of sales	max. 0.5%
Costa Rica	Eco-Logica	Farm or group	500-700	200-250	0.25
Mexico	Certimex	Farm		3-200	
Peru	Bio Latina	Small farm	15-35	40	0
Colombia	Bio Latina	Small farm	20-50	40	0

Source: Wynen (2004, Table4.5).

The difference in fixed costs between domestic and foreign certifiers seems somewhat more pronounced, while foreign certifiers do not seem to pay much attention to small farmers and their particular problems. In addition, some may charge a fixed fee only, which discriminates against small farmers.

The biggest cost to farmers who want to export organic produce, however, is possibly not so much the difference between the schemes, but the need to be certified by several certifiers. When these are all bodies with a relatively high fee, the total costs add up. The countries that are best off are those where the domestic organizations can certify for a number of different markets. Certification for a second or third market does cost farmers more than if they were exporting to only one market, but as long as they adhere to the most stringent standards to start off with (and therefore no extra costs are incurred such as for storage), there is an extra charge of perhaps just US$200 to US$1,000 per year. This may constitute a small part of the extra returns to the organic producer. The problem, however, is larger when the farmer needs to pay a relatively high sum to start off with and, if wanting to get into several markets, needs to get another foreign body for the next certification. This is particularly likely to happen when a buyer stipulates the requirement of certification by a particular private certification organization, such as a supermarket accepting certification only from their local certification body. Even if harmonization is achieved on an official government level, there is little the public sector can do to enforce acceptance of public policies onto the private sector. In this paper, only public policies are discussed.

Comparing certification costs in different countries for the purpose of deciding what the savings would be in the case of harmonization is rather complicated. Some examples from

the organic wheat and coffee exporting countries illustrate the intricacies of such comparisons[7].

In many countries, certification for foreign markets makes the picture more complicated. In Argentina, for example, there were several domestic organizations that could certify for the EU and US markets. In 2002, ARGENCERT did not charge extra for certification for the EU market, but charged US$550 extra for export to the US market per project, which could include more than one producer or farm. The reason for such extra charges was the need for extra handling, such as specific inspections, and the filling out of extra forms. Although ARGENCERT did not charge more for the Japanese market than it charged for US exports, exports to Japan needed re-certification by a Japanese certifier, which caused extra costs to producers of about US$3,000 per certification.

In Australia, certifications by country-accredited organic certifiers entitled producers automatically to export to the EU and some other countries. This was also true for export to the Japanese market. However, if a farmer or processor wanted to export produce in a different form than bulk (which could carry the certificate 'Produced in compliance with JAS standards') with a JAS label, 'add-ons' were needed. NASAA charged an extra cost of US$150-250 for inspection and US$65-130 for review in 2002. The same principle was applied to export for the US market, for which organizations (including NASAA and a second certifier, the Biological Farmers of Australia (BFA)) were accepted, rather than the Australian national scheme.

According to Hungarian law, no foreign certifiers were allowed to certify in Hungary in 2002. This meant that, if farmers wanted to export with a specific logo from, for example, a certifier in another European country, Biokontroll Hungary could inspect and send the report to the foreign organization, which then allowed the use of its logo if certification was granted. This phenomenon occurred as some consumers were more interested in products certified by specific certifiers. Cooperation existed with private foreign certification offices (C.O.), such as KRAV (Sweden), Bio Suisse (Switzerland), the Soil Association (UK) and Naturland (Germany). A similar arrangement with BCS (a German C.O.) served farmers who wished to export to the USA. Biokontroll Hungaria did not charge more for these certifications, except for ones involving BCS, which were over 100 Euros extra per farm. Exact charges depended on several factors, such as turnover.

In Slovakia, the only domestic certifier, Naturalis, was not allowed to certify for products destined for the export market. Exporters contracted a foreign certifier directly to certify farms for export.

In the United States, a farmer certified with OCIA International needed to pay an extra US$80 to be able to export to the EU and Switzerland – if there were no complications. Of this amount, US$60 was for export verification, and US$20 for an import certificate. For a farmer who wanted to export to Japan as JAS certified, a total fee of US$1,500 was charged as a fixed cost.

In Canada, certification by OCIA guaranteed access to the US market. For export to the EU and Japan, similar prices were charged to those in the United States by OCIA International.

Most of Mexico's exports went to the EU. Certimex inspects for IMO. In such a case, the expenditure for certification increases by 50 to 60 per cent. Charges were US$300-320 per day, with the initial administrative work and inspection being around 2 days work, which is carried out by Certimex. Other foreign certifiers include OCIA (for the US market) and Naturland.

In Brazil, fees for certification for one extra market were charged as one day's work for each stage (production or processing). For example, if the production process of a product needed to be certified for the EU, US and Japanese market, charges for four days applied – two for the EU, and one day extra for the United States and Japan each. An extra two days was

7 Examples quoted here reflect the situation at the time of the report in 2002. Charges were calculated in US$ with exchange rates relevant at that time.

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charged over and above the certification for the EU for certification of processing. The cost was US$200 per day for a large farm, and US$100-200 per day for a group of farms.

Since Bio Latina, in Peru and Colombia, was accredited by USA NOP, products certified by them could be exported to the United States without extra charges.

Indirect costs of compliance[8]

Indirect costs can, potentially, be a large part of the costs of non-harmonization. They are the additional production, processing and marketing costs incurred in meeting the requirements of certification to second or third markets. These can cause final consumer prices to be relatively high, either by increased production costs (if costs are prohibitively high) or reduced supply. This last can happen when requirements in the foreign standards in the production methods are illegal in the exporting country, such as the non-use of chlorine in the cleaning of livestock sheds (see below).

These costs are difficult to quantify. The indirect costs may be zero if the first certifier is the most stringent in every respect, and the standards are appropriate for the particular country.

But sometimes, requirements make inputs more expensive to farmers. These requirements, established by importing countries for their own specific conditions of climate, soil, agricultural practices and legal conditions, may not be appropriate for the exporting country, or not possible to comply with. Examples are:

- manure used on an organic farm needing to originate from an organic farm. In Peru, most of the neighbouring farms of an organic farm would not use any fertilizers or pesticides, but would not be certified organic. In such a case, manure from such farms could still not be used on a certified organic farm;
- chicken litter, if used as manure, needs to be proven to have no GE products included in it. However, in South Africa the Department of Agriculture doesn't have the capacity to check this;
- availability of organically certified seed tends to be a problem in developing countries;
- in *South Africa*, the requirement by a foreign certifier not to use chlorinated water in the packinghouse were in direct contravention to the domestic legal requirements. Regulations in South Africa stipulated that chlorinated water be used in such an environment. As these problems were difficult to overcome, export of fresh fruit and vegetables was virtually not possible.

Apart from the inappropriateness of foreign standards for conditions in an exporting country, other issues are relevant to general problems of developing ones own system. The organic world market has been developing especially since the 1980s. Since that time, requirements in terms of standards and certification have increased dramatically, and those countries that have not been part of this scene from the beginning are at a distinct disadvantage. Possibilities to obtain the knowledge and skills to keep up with developments are likely to diminish over time. This means that those countries that feel it is too difficult to break into that market may stay dependent on foreign, and usually more expensive, certifiers.

The cumulative effects of a number of situations as described above affects the dynamics in the market. For example, established exporters may not be interested to enter the organic market at all when an array of problems occur regularly. This would then mean that producers have no buyers, at least not established exporters who are willing to take the risk. Inexperienced exporters would increase the risk for the producer, and therefore increase the cost of export. This can be treated as an increase in input costs to the final product.

With harmonization the dynamics of the organic international market are likely to change considerably as, for example, with low risk of non-availability supermarkets are willing to stock their shelves with products, processors are willing to have a special run for organic products, and consumers can be more assured of availability and quality of the product.

[8] For more details, see Wynen (2004, Section 4.3)

Methodology[9]

The quantitative analysis employs GSIM, a static, single commodity, bilateral trade model that distinguishes between imports from different sources (Armington assumption)[10]. This is essential to capture the impacts on trade of the differential cost changes in different countries, in this case due to the certification of third country exports.

GSIM is essentially a set of simultaneous equations in a spreadsheet in which export prices are varied to satisfy the requirement that global imports equal exports. As a static model it compares two situations at a point in time and does not attempt to show the transition from one state to another or to assess the costs of adjustment. In this particular case, the effect on trade was assessed under conditions of harmonization and non-harmonization, where harmonization indicates a situation with reduced direct and indirect certification costs. Compared with the situation of non-harmonization, this decrease in cost will affect consumer prices, and so the demand and production of the product. The aim of this research is to estimate the final effects on total returns to farming and on consumer expenditure (called 'total welfare').

As a single commodity model (for example, wheat), potential linkages between other goods in consumption (for example, oats) or production (livestock) are ignored. A further simplifying assumption is no changes in stocks. The model is typically used to analyse the effect of reduction in tariffs, export subsidies and production subsidies or transport costs. In this case, it is used to analyse the effect of a change in certification costs, which can be treated as equivalent to transport costs or tariffs.

No effect on consumption of domestically produced goods, i.e. no trade with one-self, was included. Factors of relevance to trade but not specific to harmonization, such as fluctuation in exchange rates, were not accounted for in this work.

Data

As with most models, the data available determines the quality of the output. In this case the data required includes:

- bilateral trade flows between the main countries involved in trade, that is, quantities traded and values of those goods;
- direct and indirect certification costs under differing assumptions;
- responsiveness of production and consumption to changes in prices.

Bi-lateral trade flows: quantities and values

- Wheat

Six main wheat exporters were identified for 2002, the latest year for which data were available, three of which provided data on quantities of organic wheat traded by government or marketing bodies. In Argentina, the data were available on the website of the Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA)[11]. In Australia, similar data were obtained from the Australian Quarantine Inspection Service (AQIS), and the Canada Wheat Board provided data for export quantities from Canada. In a fourth country, Hungary, data on quantities of organic wheat exported were obtained from the certification organization Biokontroll[12], and in Slovakia and the USA traders provided estimates on the basis of anonymity. This information was cross-checked with estimates from Dutch traders, who imported organic wheat. The data are shown in Table 4.

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[9] The author thanks David Vanzetti for his assistance with the modelling.

[10] GSIM was developed by Joseph Francois of the Tinbergen Institute and H. Keith Hall of the U.S. International Trade Commission. The model is documented in a memo by these authors entitled 'Global Simulation Analysis of Industry-Level Trade Policy', October 2002. See also Francois, J.F. and H.K. Hall, "Partial Equilibrium Modeling," in J.F. Francois and K. Reinert, eds., *Applied Methods for Trade Policy Analysis*: A Handbook, Cambridge University Press: Cambridge, 1997.

[11] http://www.senasa.gov.ar/oldweb/fiscalizacion/ecologicos.php

[12] http://www.biokontroll.hu/english/

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Table 4: Export of organic wheat by source and destination in 2002 (tonnes '000)

Exporter	Destination						
	USA	EU	Switzerland	Japan	RoW	Total	%
Argentina	-	4.3	1.6	-	0.1	6.0	5
Australia	-	4.2	1.6	1.9	1.4	9.2	8
Canada	13.5	13.5	-	1.5	1.5	30.0	26
Hungary	-	27.6	4.0	-	-	31.5	27
Slovakia	-	7.5	-	-	-	7.5	6
USA	-	20.0	10.0	3.0	-	33.0	28
Total	13.5	77.2	17.1	6.4	3.0	117.2	100
%	12	66	15	5	3	100	

Source: Wynen (2004, Table 6.1))
Note: errors in additions are due to rounding RoW = rest of world

Prices generally were averages of estimates of several sources, such as local certification offices and traders. Combined with the data on quantities, this led to estimated values of exports of organic wheat as displayed in Table 5.

Table 5: Exports of organic wheat by source and destination in 2002 (US$'000)

Exporter	Destination						
	USA	EU	Switzerland	Japan	RoW	Total	%
Argentina	-	1,043	368	-	18	1,465	5
Australia	-	1,336	513	600	304	2,900	9
Canada	3,240	4,253	-	473	473	8,438	27
Hungary	-	5,932	850	-	-	6,781	22
Slovakia	-	1,350	-	-	-	1,350	4
USA	-	6,100	3,050	915	-	10,065	33
Total	3,240	20,013	4,781	1,987	946	30,968	100
%	10	66	15	6	3	100	

Source: Wynen (2004, Table 6.2)
Note: errors in additions are due to rounding RoW = rest of world

Apart from the six main exporting countries, there were four main importers - EU, USA, Switzerland and Japan - plus the 'rest of world' (RoW). A feature of the organic wheat industry in 2002 was that the trade was dominated by imports into the European Union (66 per cent of quantity and value). The total organic wheat exports in 2002 amounted to an estimated 117,236 tonnes, which had an export value of just under US$31 million.

- Coffee

For coffee, most of the 13 main exporters were located in Central and South America. Data from those countries for 2002 were obtained from the Centro de Inteligencia sobre Mercados Sostenibles (CIMS), which specializes in data on coffee. Figures for other countries (in Africa, and in Indonesia and PNG) originated from local traders and certification offices, and are estimates (see Table 6).

A feature of the organic coffee industry was that the trade was dominated by exports from Central and South America from which 95 per cent of total export quantity originated. The total organic coffee exports in 2002 amounted to an estimated 57,000 tonnes. Almost two thirds was exported from Mexico and Peru. Indonesia and PNG, and especially Tanzania and Uganda were rather small exporters. Almost half of the imports went to the EU, and the rest was imported mainly by the USA, with approximately 10 per cent of the total going to Japan.

CIMC (2004) supplied export prices for all Latin American countries. In the other coffee exporting countries traders provided estimates. Multiplying those values with the quantities exported as shown in Table 6 provided estimates of total export values, as shown in Table 7.

It shows a total value of organic coffee exported in 2002 of close to US$108 million, 94 per cent of which originated in Latin America.

Table 6: Exports of organic coffee by source and destination in 2002 (tonnes)

Exporter	Destination					
	EU	USA	Japan	RoW	Total	%
Mexico	9,715	10,771	646	409	21,541	37.9
Peru	6,758	5,172	268	-	12,198	21.4
Brazil	874	1,063	2,213	55	4,204	7.4
Guatemala	1,566	1,843	492	67	3,968	7.0
Colombia	514	936	1,679	3	3,132	5.5
Nicaragua	984	1,788	-	80	2,851	5.0
Bolivia	1,731	197	21	-	1,949	3.4
Honduras	1,028	193	-	288	1,510	2.7
Costa Rica	107	928	-	-	1,035	1.8
Indonesia	1,000	414	-	-	1,414	2.5
PNG	468	-	-	-	468	0.8
Tanzania	106	26	-	-	132	0.2
Uganda	956	239	-	-	1,195	2.1
RoW	585	403	286	-	1,274	2.2
Total	26,390	23,973	5,606	903	56,871	100.0
%	46.4	42.2	9.9	1.6	100.0	

Source: Wynen (2004, Table 7.1)

Table 7: Exports of organic coffee by source and destination in 2002 (US$'000)

Exporter	Destination					
	EU	USA	Japan	RoW	Totals	%
Mexico	17,565	19,473	1,168	740	38,946	35.9
Peru	11,475	8,782	456	-	20,712	19.1
Brazil	1,752	2,132	4,440	110	8,434	7.8
Guatemala	3,590	4,227	1,127	155	9,099	8.4
Colombia	1,246	2,271	4,071	8	7,595	7.0
Nicaragua	2,038	3,704	-	165	5,907	5.4
Bolivia	2,747	312	34	-	3,093	2.8
Honduras	1,904	358	-	534	2,797	2.6
Costa Rica	263	2,292	-	-	2,555	2.4
Indonesia	2,934	1,215	-	-	4,149	3.8
PNG	1,372	-	-	-	1,372	1.3
Tanzania	142	36	-	-	178	0.2
Uganda	945	236	-	-	1,181	1.1
RoW	1,189	818	581	-	2,589	2.4
Total	49,162	45,856	11,877	1,712	108,607	100.0
%	45.3	42.2	10.9	1.6	100.0	

Source: Wynen (2004, Table 7.2)

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Certification costs under differing assumptions

Costs of certification in the different countries was obtained from publications or from certification offices[13]. Where these were not available, estimates were obtained from traders.

As *direct certification costs*[14] can be charged in many different ways (e.g. flat and variable rates, related to area under production or total production, or a combination of these), an average cost per unit of product needed to be calculated for use in the model. Taking into account variables such as yield, rotation schedules common in each country, and actual farm-gate prices in 2002, certification costs for domestic consumption were estimated per tonne of produce in each country. Since, in the situation of harmonization, products can be exported when certified by the local organization, present costs for domestic certification were taken as post-harmonization costs of certification for exports.

For the situation prior to harmonization, the extra costs for exports were added to the basic certification costs in the model, depending on the different export destinations. For example in Australia, no foreign certifiers were needed for organic exports to any of the three major markets (EU, US and Japan). NASAA's basic certification allowed exports to the EU, and certifications for exports to the last two countries were 'add-ons' and cost US$300 per farm extra. This compared with extra charges for exports to those countries in Argentina of US$550 per farm, with farmers needing more extra arrangements for exports to Japan with a Japanese organization, which was rather expensive at US$3,000 per farm.

Apart from producers, others in the *marketing chain*[15] (from producer to consumer, including transport, exporter, importer, and packaging) were subject to certification; and their costs would also be reduced with harmonization. For this reason, some of the options in the model added certification costs for the marketing process. The costs were estimated on the basis of information supplied by certification offices, traders, and educated guesses. They assumed that:

- three more operations the farm needed to be certified;
- variable costs were one per cent of the value added between importer and farm-gate (as it was in Argentina and Hungary);
- fixed cost was the same as the farmer's, but each enterprise serviced 10 farmers in the wheat market.

That is, the total wheat marketing costs were calculated as being 3 times 10 per cent of the estimated total costs.

Because of problems with quantifying the effects of *indirect costs*[16], a range of assumptions were made, after consultation with the industry, for the purpose of use in the model. One of the assumptions was that indirect costs for producers were zero, another that they were similar to direct costs. Others for wheat include a fixed cost of $500 per farm, $10 per tonne, and 10 or 1 per cent of total farm-gate value. For coffee, the fixed costs per farm and per tonne were omitted.

In the model, effects of harmonization under a number of combinations of direct and indirect certification costs were examined, so that some impression could be gained about the range of values of gains/losses which were likely to result from harmonization, depending on which assumptions one favoured. In Tables 8 and 9 estimates are shown of values for before and after harmonization, for wheat and coffee respectively[17]. In these particular tables, estimates are shown pertaining to the situation where indirect costs are equal to direct costs - the values change with different combinations of direct and indirect costs.

[13] Certification offices in wheat exporting countries: Argentina: ARGENCERT; Australia: NASAA; Canada and USA: OCIA International; Hungary: Biokontroll; Slovakia: Naturalis. Certification offices in coffee exporting countries: Brazil: IBD; Costa-Rica: Eco-Logica; Bolivia, Colombia, Honduras, Peru, Nicaragua: Bio Latina; Mexico and Guatemala: Damiani (2001; 2002); Indonesia, PNG: NASAA; Tanzania and Uganda: traders.

[14] For details on charges in different countries, see Wynen (2004, p.130-143).

[15] See Wynen (2004, p163).

[16] See Wynen (2004, p.143-151).

[17] For more details, see Wynen (2004, p181, p183).

Table 8: Total estimated certification costs as % of wheat import value (2002)

	EU	USA	Japan
Without harmonization			
Argentina	0.6	2.7	9.7
Australia	0.3	1.3	1.3
Canada	1.3	0.6	4.3
Hungary	1.4	4.0	5.3
Slovakia	2.3	3.9	5.4
USA	2.0	0.9	4.9
With harmonization			
Argentina	0.6	0.6	0.6
Australia	0.3	0.3	0.3
Canada	0.6	0.6	0.6
Hungary	1.4	1.4	1.4
Slovakia	1.2	1.2	1.2
USA	0.9	0.9	0.9

Source: Wynen (2004, Table 6.5 and 6.7).

Table 9: Total estimated certification costs as % of coffee import value (2002)

	EU	USA	Japan
Without harmonization			
Mexico	4.5	4.5	30.9
Peru	6.1	4.1	27.9
Brazil	1.6	1.6	10.8
Guatemala	8.0	5.3	36.6
Colombia	13.4	9.0	61.6
Nicaragua	6.1	4.1	28.2
Bolivia	6.2	4.2	28.3
Honduras	2.3	1.6	10.8
Costa Rica	1.2	0.8	5.6
Indonesia	1.5	1.5	10.5
PNG	1.7	1.7	11.9
Tanzania	10.5	10.7	70.5
Uganda	1.2	1.3	8.4
With harmonization			
Mexico	1.5	1.5	1.5
Peru	2.0	2.1	2.0
Brazil	0.6	0.6	0.6
Guatemala	2.7	2.7	2.6
Colombia	4.5	4.5	4.4
Nicaragua	2.0	2.1	2.0
Bolivia	2.1	2.1	2.0
Honduras	0.8	0.8	0.8
Costa Rica	0.4	0.4	0.4
Indonesia	0.4	0.4	0.4
PNG	0.4	0.4	0.4
Tanzania	2.6	2.7	2.5
Uganda	0.3	0.3	0.3

Source: Wynen (2004, Tables 7.5 and 7.7).

As can be seen in Table 8, Australia and Argentina had the lowest certification costs for organic exports to the EU before harmonization; Canada and the USA showed the lowest certification cost (for the USA market). The cost of certification of wheat by all exporters to

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Japan was estimated as being considerably higher than for exports to the other two main importers, with Australia again showing the lowest costs. After harmonization, the costs of certification to all exporters was assumed to be equal, and was set to the same level as that of the cheapest costs for one of the export destinations in the exporting country.

For most Latin American countries the cost of certification of a coffee farm was between US$40 and US$60 per farm in 2002. In many of those countries – Mexico exempted - organizations operated which were NOP-accredited[18]. Certification costs per farm for export to the USA were therefore relatively low, though a low average yield led to high certification costs per tonne, for example in Guatemala and Colombia (see Table 9). Exports to the EU were generally estimated at 50 per cent increase in costs over those to the USA, as foreign certifiers were needed in almost all countries. In the other four countries, Indonesia and PNG and the two African countries, costs of certification for the EU and USA markets were considered to be similar, as foreign certifiers were needed to certify for both markets[19].

Estimates of costs to Japan were somewhat complicated[20]. Suffice here to say that, since none of the organic coffee exporting countries had facilities for easy access to the Japanese market, the costs to export to Japan were considerably higher than for exports to the other two importers.

As with wheat, the costs of certification to all exporters was assumed to be equal after harmonization.

Responsiveness of demand and supply to changes in prices[21]

Responsiveness of demand and supply to price changes (i.e. price elasticities of demand and supply), and of substitution are borrowed from conventional markets, and are shown in Table 10 for the wheat and coffee market.

It is likely that consumers of organic products respond differently to price changes than buyers of conventional products for a number of reasons, including:

as there may be many more substitutes for a particular product in the conventional market than in the organic market, organic buyers may find it more difficult to find suitable substitutes, and may therefore be less responsive to price rises;

- loyalty of consumers to the organic product. Some will not change product out of principle or for health reasons;

- organic products are usually somewhat more expensive than the conventional ones, and at a higher level of price for the same product. Responsiveness by buyers may therefore well be greater with price rises and, with price reductions, may-be higher than in the conventional market.

The last factor works in the opposite direction from the first two. It is therefore difficult to say what the net effect would be in terms of responsiveness of demand to price changes in the organic market. Over time, however, the response of buyers of organic products may be more inclined to be according to the last group, which would increase the sensitivity of the *elasticity of demand*. Higher levels than those used in conventional products are therefore tested in the model.

The *price elasticity of supply* reflects the reactions in supply to price changes. In the situation of a drop in prices, it is influenced by the ease with which organic farmers can switch to other enterprises or move to conventional production. Increasing prices for organic products may attract expansion of production of existing organic farmers and/or conversion by conventional farmers - though becoming an established organic farmer is more difficult than the other way round. This implies that there is a longer gap between the decision made to produce

[18] NOP: National Organic Program. Organic produce certified by an organization accredited by the US Department of Agriculture can export to the USA with relative ease.

[19] As with values 'after harmonization' the percentage costs may differ between countries of destination as import prices vary.

[20] Ways of estimation are explained in Wynen (2004, p.180-181).

[21] For more details, see Wynen (2004, p.154-156).

organically and the availability of extra organic products than in decreasing organic production. Testing the *elasticity of supply* for values higher than those used for conventional products is carried out to cover the situation of more farmers wanting to get into organic management than what is usually the case within conventional management.

Table 10: Elasticities of demand and supply for wheat and coffee

	Demand	Supply
Wheat		
EU	-0.60	0.61
USA	-0.09	0.50
Japan	-0.25	0.38
Coffee		
Mexico	-0.20	0.65
Peru	-0.17	0.42
Brazil	-0.20	0.70
Guatemala	-0.10	0.40
Colombia	-0.06	0.23
Nicaragua	-0.17	0.42
Bolivia	-0.17	0.42
Honduras	-0.17	0.42
Costa Rica	-0.37	0.75
Indonesia	-0.32	0.12
PNG	0.00	0.39
Tanzania	-0.25	0.34
Uganda	-0.07	0.29
EU	-0.14	0.00
USA	-0.07	0.00
Japan	-0.05	0.00
RoW	-0.17	0.42

Source: ATPSM data-base (www.unctad.org/tab).

To test whether the estimates in this research were sensitive to the particular values borrowed from the conventional world, tests were conducted to see whether they changed a lot if assumed elasticities were doubled, and then doubled again. This test was carried out on a scenario with a combination of direct and indirect costs that seemed most appropriate (see below).

The elasticity of substitution measures the reaction in demand if products are more similar, and therefore can be substituted, when originating from different countries. For example, if the price of imports of Canadian wheat into the EU falls as compared with Argentinean wheat (due to more savings in certification costs in Canada with harmonization), would the buyers substitute wheat from Argentina with Canadian wheat? Some kinds of wheat are suitable for bread making, others for pasta or biscuits. If the quality of the wheat is similar, there is a much higher chance that substitution happens than if it has a completely different quality. The results of gain from harmonization are tested on their stability in the case of different levels of sensitivity to differences in quality in the importing countries.

The default elasticity of substitution is 5, common in this type of analysis. It has been doubled to 10 as a reasonable alternative. In addition, a third value of 20 is estimated, indicating great flexibility. In other words, with a small change in price, under this scenario buyers would switch from one to another country. This implies almost complete substitutability, a characteristic of raw commodities.

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Results

Figures shown in this section summarise gains and losses experienced by producers and consumers (called net welfare gains) and changes in total trade. The total net welfare gains are not necessarily the same as changes in total trade, as changes in production costs are not accounted for in the trade figures, while they are in the welfare figures. No attention was given to changes in revenue to governments as a result of changes in quantities traded - for example, due to changes in tariff revenue or subsidies.

Wheat

The effect of harmonization was estimated under different combinations of direct and indirect costs. Direct costs to producers are counted under all options in Table 11 (from 1 to 10), but those to the marketing chain are counted only in options 2, 5 and 6. If no other than the direct costs to producers (i.e. extra certification costs) are eliminated with harmonization (option 1), then the welfare gains would have amounted to almost $37,000 in 2002. It would have increased to more than three times the amount ($119,000, or 0.4 per cent of the total value of the international organic wheat market) under a more realistic scenario of eliminating extra costs in the whole of the marketing sector (option 2).

The rest of the options then show the results of combining the two different levels of direct costs with different assumptions of indirect costs.

In option 3 (with direct costs to only producers), and option 5 (with direct costs to producers and the marketing chain) the indirect costs of only Slovakia, the US and Canada into the EU were counted. The reason for this was that, because Argentina, Australia and Hungary were on the EU 3rd-country list[22], the indirect costs of exports to the EU from these countries would be low or non-existent. No indirect costs for imports into the USA from Canada were included. Under options 4 and 6, all conditions are the same as in 3 and 5, except that indirect costs in the three countries with special arrangements to the EU are now counted as being similar to the direct costs, and Canada has also indirect costs for its exports to the USA.

The net welfare gains of these four options is between $224,000 and $417,000 (or 0.7 and 1.3 per cent of the total wheat exports), with the most realistic scenario of these four (option 6) at $417,000 or 1.3 per cent of total export value.

Table 11: Welfare gains in wheat with harmonization of organic guarantee systems (2002)

	Direct cost		Indirect cost					Welfare gains	
	Producers	Market chain	Minimal	+EU	$/farm	$/t	% farm-gate value	$'000	%
Options									
1	x							36.5	0.1
2	x	x						119.3	0.4
3	x		x					224.4	0.7
4	x		x	x				334.1	1.1
5	x	x	x					307.1	1.0
6	x	x	x	x				416.7	1.3
7	x				500			232.9	0.8
8	x					10		1,022.0	3.3
9	x						10	2,151.1	6.9
10	x						1	246.3	0.8

Source: Wynen (2004, Table 6.18).
Note: x = included in analysis; blank = not included in analysis.

A further set of options combined minimal direct costs with indirect costs of US$500 per farm (option 7); US$10 per tonne (option 8); and 10 and 1 per cent of total farm-gate value (options

[22] In 2002, the several different systems of importing organic produce from third (non-EU member) countries were in place in the EU. By far the easiest way to export was if the country was acknowledged by the EU as having equivalence with the EU regarding organic certification. Of the countries included in this study, Argentina, Australia, Hungary and Costa Rica were on this list in 2004 (Vossenaar and Wynen 2004).

9 and 10). Under the first of those options, indirect costs per farm of US$500 (option 7), the welfare gains were quite close to those under option 3 (US$233,000 as compared with US$224,000). This is not surprising as this is a less refined variant of option 3, with indirect costs being independent of direct costs. The estimates of indirect costs of US$10 per tonne of wheat or 10 per cent of total farm gate value (options 8 and 9, respectively) meant considerably higher gains from harmonization, leading to gains of US$1-2 million, or between 3.3 and close to 7 per cent of the total value of trade. Option 10 then probed the returns to harmonization under the conditions that the indirect costs reach only 1 per cent of total farm-gate value, with returns to harmonization being less than 1 per cent.

Also the *distribution of gains* of harmonization is an important consideration, and is shown in Table 12 under conditions of option 6 in Table 11, i.e. inclusion of direct costs to the producer and marketing chain, and minimal indirect costs - equal to direct costs, also for Argentina, Australia and Hungary in trade with the EU[23].

Table 12: Distribution of gains in organic wheat market after harmonization (2002)

Exporters/importers	Welfare				Trade	
	Producers	Consumers	Total		Total	
Canada	US$	US$	US$	%	US$	%
Argentina	3,990		3,990	0.3	6,425	0.4
Australia	-7,535		-7,535	-0.3	-12,127	-0.4
Canada	34,162		34,162	0.4	55,018	0.7
Hungary	68,656		68,656	1.0	110,619	1.6
Slovakia	12,768		12,768	0.9	20,571	1.5
USA	68,902	12,377	81,279	0.7	111,030	1.1
EU		127,821	127,821			
Switzerland		30,240	30,240			
Japan		58,710	58,710			
RoW		6,583	6,583			
Total	180,944	235,731	416,675	1.3	291,536	0.9

Source: Wynen (2004, Table 6.16).

One would expect the largest gains from harmonization to go to those wheat-exporting countries that have a combination of high trade flows (Table 4, Canada, Hungary and the USA) and high initial total certification cost (Table 8, Canada, Hungary, Slovakia and the USA). In the organic wheat exporting countries it was, indeed, especially Canadian and US producers who gained under option 6 (Table 11), as under many other options of indirect costs. Hungary, though a major exporter, traded essentially with one market (the EU) and stood to gain little from measures that facilitated trade with other importers. In the EU market it already had a privileged position, so that harmonization did make it less competitive relative to other exporting countries. Slovakia gained greatly, relative to its total exports, because its certification costs dropped considerably with harmonization. The trade gains are higher than the welfare gains for producers, as no extra production costs have been deducted from the trade figures.

For Australia the welfare gains were not that significant – in fact, under several options the net result was a loss, as under option 6 (Table 11), shown in more detail in Table 12. Australia was a relatively small exporter of organic wheat in 2002 and had, like Hungary and Argentina, reasonably easy access to the EU market. In addition, Australia was a low-cost certifier as compared with the other wheat exporters (see Table 8) and had therefore less scope for gains through harmonization than other countries[24]. This meant that, with several options in Table 11, Australia lost under conditions of harmonization, to a maximum of 0.5 per cent of total export value. For example, under option 1 the total loss of all wheat exports was US$4,500 or 0.2 per cent. Under options 2, 3 and 6 this would have been US$453, US$13,300 (0.5 per cent) and US$7,500 (0.3 per cent) respectively. Under other options,

[23] More details can be found in Wynen (2004, p.161-175).

[24] See Wynen (2004, Table 6.4).

notably 8 (US$31,700 or 1.1 per cent) and 9 (US$46,500, or 1.6 per cent) Australia could have gained far more than it could have lost under any of the options. These last two options were possibly somewhat optimistic for Australia, as they are for Argentina and Hungary, as it assumed indirect costs similar to those exporters without special status in the EU import market.

Of the importing countries, especially the Japanese consumers gained, as the original certification costs were highest for export to that country, and therefore had most potential to drop with harmonization. However, with options 8 and 9, where indirect costs were counted for all trade to the EU, large gains were made by EU consumers (US$763,000). This was due to a drop in consumer prices. In the USA no large gains were made by consumers, and in some scenario's losses were made, such as in options 1 and 3 in Table 11. The reason was that, under some conditions, the price of USA organic wheat exports increased, which resulted in more exports from the USA, and increasing wheat prices within the USA.

Changes in *elasticity values* recorded little change in total welfare, although trade flows did vary somewhat, mainly with a change in price elasticity of demand. In Table 13, total figures for changes in welfare and trade are shown for option 6 in Table 11, where direct cost of both producers and the marketing chain were counted, and the indirect costs were assumed to be equal to direct costs[25]. A higher elasticity of demand for organic food than for conventional would lead to more of the gains going to producers, instead of consumers (not shown in the table). Although the magnitudes of trade changed in this situation, the direction did not. The implication is that the estimates are quite robust.

Table 13: Sensitivity analysis elasticities: wheat

Demand		**standard**	**x2**	**x4**
Welfare	$	416,675	416,288	416,097
	%	1.35	1.34	1.34
Global trade	$	291,536	400,866	493,018
	%	0.94	1.29	1.59
Supply		**standard**	**x2**	**x4**
Welfare	$	416,675	417,707	418,543
	%	1.35	1.35	1.35
Global trade	$	291,536	261,189	238,130
	%	0.94	0.84	0.77
Substitution		**5**	**10**	**20**
Welfare	$	416,675	416,678	416,691
	%	1.35	1.35	1.35
Global trade	$	291,536	290,143	287,763
	%	0.94	0.94	0.93

Source: Wynen (2004, Table 6.17).

Coffee

The different combinations of direct and indirect costs, and the effect on trade and welfare after harmonization in the coffee trade were assumed to be very much along the lines as for wheat. That is, the first two options in Table 14 combined zero indirect costs with minimal direct costs pertaining to producers only (option 1), and to producers and the marketing chain (option 2). Options 3 and 4 combined option 1 and 2, respectively, with indirect costs being equivalent to direct costs. The last two options combine option 1 with indirect cost equivalent to 10 (option 5) and 1 per cent (option 6) of product value at the farm-gate.

Table 14: Welfare gains in coffee with harmonization of organic guarantee systems (2002)

	Direct cost	Indirect costs	Welfare gains

[25] Only total figures are shown here. For more details, see Wynen (2004, p.170-172).

	Producers	Market chain	Minimal	% farm-gate value	$'000	%
Options						
1	x				2,418	2.2
2	x	x			3,511	3.2
3	x		x		6,784	6.2
4	x	x	x		7,873	7.2
5	x			10	8,800	8.1
6	x			1	3,055	2.8

Source: Wynen (2004, Table 7.15).
Note: x = included in analysis; blank = not included in analysis.

The first option indicated the bare minimum gains from harmonization, when no certification costs were counted for any other operation than the production process, and no indirect costs were present – both assumptions being rather unrealistic. Even in that case, the welfare gains were around 2 per cent of total trade. When the marketing chain was included the welfare gains increased to US$3.5 million, or over 3 per cent (option 2). When indirect costs were included as equivalent to the direct costs, the gains from harmonization increase again – to over US$6.5 million (over 6 per cent) without marketing chain certification costs (option 3), and almost US$8 million (7.2 per cent) with costs to the marketing chain (option 4). The last two options in the table show the effect of harmonization when the indirect costs were related to returns from farming, assuming an indirect cost of 10 per cent of farm-gate value in option 5, and 1 per cent in option 6. The estimates varied between US$8.8 million, or over 8 per cent of total trade, and US$3 million, or close to 3 per cent.

Analysis of the *distribution of the gains* shows that most of the gains go to the consumers, and not to the producers. One example, of option 4 in Table 14, is shown in Table 15.

Table 15: Distribution of gains in organic coffee market after harmonization (2002)

Exporters/importers	Welfare				Trade	
	Producers	Consumers	Total		Total	
	US$	US$	US$	%	US$	%
Mexico	70,868		70,868	0.2	116,947	0.3
Peru	39,141		39,141	0.2	64,605	0.3
Brazil	-644,677		-644,677	-7.6	-1,059,940	-12.6
Guatemala	100,786		100,786	1.1	166,653	1.8
Colombia	665,473		665,473	8.8	1,124,340	14.8
Nicaragua	6,928		6,928	0.1	11,434	0.2
Bolivia	17,032		17,032	0.6	28,131	0.9
Honduras	-60,377		-60,377	-2.2	-99,222	-3.5
Costa Rica	-48,944		-48,944	-1.9	-80,728	-3.2
Indonesia	-59,369		-59,369	-1.4	-97,490	-2.3
PNG	-17,549		-17,549	-1.3	-28,882	-2.1
Tanzania	7,401		7,401	4.2	12,324	6.9
Uganda	-24,636		-24,636	-2.1	-40,438	-3.4
EU		2,121,903	2,121,903		0	0.0
USA		1,407,072	1,407,072		0	0.0
Japan		4,118,108	4,118,108		0	0.0
RoW	-19,082	193,989	174,906	6.8	-31,443	-1.2
Total	32,995	7,841,072	7,874,068	7.3	86,291	0.1

Source: Wynen (2004, p.188).

One of the striking observations is that, under this scenario, almost all gains in the coffee industry from harmonization would go to consumers, mostly in Japan, and not to producers.

Of the 13 coffee producers, only 7 would gain, 6 of them in Latin America. The gains in Colombia, the largest winner in absolute terms, can be contributed to the fact that farm incomes from organic coffee were rather low. A change in certification costs, even when

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similar to other countries in absolute terms, was large relatively to the value of the coffee – a drop from 13.4 to 4.5 per cent with harmonization (see Table 9). This decrease certification costs increased the price for coffee paid to local producers. It also lowered the export price for Colombian coffee, replacing coffee exported from other countries, particularly from Brazil. A similar situation occurred in the other countries that gained, and in particular in Tanzania, the only non Latin American country that gained from harmonization.

There were six losers in the case of harmonization in the coffee market, with Brazil being by far the largest. Brazil was a special case in the group of organic coffee exporters. The product was grown on large farms - more than 10 times the size of farms in most other countries included in the study. Its certification system was efficient before harmonization, and harmonization would therefore not reduce its costs greatly - from 1.6 to 0.6 per cent (see Table 9), especially not per tonne. Decreasing export prices in other countries forced Brazil to drop its prices, with resulting lower production. The mechanism is the same in the other exporting countries who were losers under conditions of harmonization; they all have relatively low original certification costs. In Indonesia and PNG this was due to the fact that certification was handled by NASAA, which had good working conditions with all importing countries (see the example of the wheat market above), but one would possibly expect Tanzania and Uganda to be similar regarding coffee exports. However, the original certification costs per farm in Tanzania were considerably higher than in Uganda (see Table 9) because of lower number of farmers participating in the certification scheme, and the production per farm being considerably lower.

The fact that most gains would go to consumers in Japan does not come as a surprise, as the largest decreases in import costs, up to 70 per cent, due to decreases in certification costs with harmonization would occur there. But also in the other two importing countries, and in particular in the EU, the consumers would gain considerably through decreases in coffee prices.

Elasticities have been used that apply to conventional agriculture. Changes in welfare and trade due to variations to those values are shown in Table 16.

Table 16: Sensitivity analysis elasticities: coffee

Demand		**standard**	**x2**	**x4**
Welfare	$	7,874,068	7,882,483	7,902,973
	%	7.3	7.3	7.3
Global trade	$	86,291	1,155,432	2,716,022
	%	0.1	1.1	2.5
Supply		**standard**	**x2**	**x4**
Welfare	$	7,874,068	7,897,322	7,920,020
	%	7.3	7.3	7.3
Global trade	$	86,291	-20,229	-125,915
	%	0.1	0.0	-0.1
Substitution		**5**	**10**	**20**
Welfare	$	7,874,068	7,895,996	7,943,439
	%	7.3	7.3	7.3
Global trade	$	86,291	-851,410	-2,677,290
	%	0.1	-0.8	-2.5

Source: Wynen (2004, Table 7.14).

The overall picture is that, for total welfare, an increase in any of the elasticities did not make a difference. However, it could change the distribution of the benefits between producers and consumers - which is not shown in the table. For example, if the elasticity of demand for organic coffee were to be higher than that for conventionally-grown coffee, more of the benefits would flow to producers. But even with an assumption of a four-fold increase in price elasticity of demand (which is not a likely scenario) producers would still only increase their welfare with US$1.6 million after harmonization.

The picture for changes in trade with changing elasticities is totally different, though, with trade increasing with rising price elasticities of demand, and decreasing with rising price

elasticities of supply and of substitution. This is as expected in the case of elasticity of demand (increasing demand with lower consumer prices) and supply (decreasing capacity of producers to react to higher producer prices), but it is somewhat unexpected with the elasticity of substitution. One would expect here that, with more flexibility of importers to switch between coffee from the different exporters, trade would be enhanced. However, although coffee in several countries, such as Brazil, was displaced by coffee from other countries, especially from Colombian, to a higher degree than before, producers did not produce more coffee. Large decreases in coffee prices in Japan (up to 25 per cent) then decreased the value of the trade, though not the quantity traded on the international market. The low price elasticities of demand, especially in Japan and the USA (Table 10), were a contributing factor in the market not expanding greatly.

The lesson to be learned from this exercise is therefore that, with harmonization, producers don't necessarily gain. With a sufficiently low elasticity of demand, as in the case of coffee, consumers do not change their consumption greatly, even with drastically decreasing prices. It is possible that an expansion in production can lead to lower total returns to farmers.

Summary and conclusions

The need for standards in organic agriculture, with an accompanying certification system, causes problems for different players in the organic market. On the one hand, in the present situation of non-harmonization, extra direct costs (for inspection and certification) and indirect costs (related to production and marketing) can be expected as compared with a situation of increased harmonization. Harmonization of the organic guarantee system could therefore see a decrease in marketing costs, thereby leaving the savings to be divided between producers and consumers. However, some exporters and producers in importing countries may be disadvantaged by a move towards increased harmonization. Consumers, especially in the importing countries, can be expected to gain with increased harmonization, when all effects have worked themselves through the system.

With this theory in mind, the benefits from harmonization of organic standards and certification are quantified for the wheat and coffee markets.

Gains from harmonization of the organic wheat market are estimated to be at least US$36,500 with trade as it existed in 2002. This is the case under the minimum option (1), where only producers have extra direct cost under conditions of no-harmonization. A more realistic estimate, however, includes gains in the marketing chain and also in indirect costs. Whether it is realistic to estimate this last category as being equal to the direct costs is debatable. If considered to be so, the gains of harmonization would be US$334,000 (or 1.0 per cent) or US$417,000 (1.3 per cent) at 2002 trade levels, depending on whether indirect costs for EU 3rd-country listed exporters are counted. If the indirect costs are higher than the direct costs, as is generally considered in the industry to be likely, this would increase the gains from harmonization in the organic wheat industry. If that cost is US$10 per tonne, harmonization would have produced a gain of over US$1 million (or 3.3 per cent) in 2002. An indirect cost of 10 per cent of the farm-gate value of the organic wheat would have meant a gain of over US$2 million (or 6.9 per cent) with harmonization.

The picture is somewhat different in the organic coffee market, both in welfare gains and the distribution of those gains. The lowest value of welfare gains due to a change to total harmonization is calculated as around US$2.4, or 2.2 per cent of the export value of coffee in 2002. A more realistic estimate includes losses in the marketing chain and indirect cost. If this last category is equal to the direct costs, the gains of harmonization would be close to US$8 million, or over 7 per cent of the international organic coffee trade in 2002.

Attention was paid also to the *distribution of gains*. As harmonization affects costs (both direct and indirect) unequally in the different exporting countries, those that gain most from harmonization are likely to be those against which originally the odds were stacked most. In the organic wheat trade with data from 2002, those were the exporters in Slovakia, the USA and Canada. In the coffee trade these were most of the Latin American countries and Tanzania. In other words, in those countries where the certification costs were low anyway, the gains from harmonization were least. Some exporters lost as a result of a diminished

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competitive position relative to other exporters, for example Australian wheat farmers, and coffee farmers in Australian-certified countries, such as Indonesia and PNG - at least under some scenarios. This was because at least one of the certifiers in Australia had excellent arrangements with importing countries, which enabled farmers to be certified at low cost even under conditions of no-harmonization.

As a development strategy, harmonization in organic agriculture can work both ways. In those developing countries that have developed their organic certification infrastructure, such as Costa Rica, harmonization may bring it into a less favourable position *vis-à-vis* other exporters with which it competes, including other developing countries. However, in general, developing countries do not have such a structure, and are likely to benefit from harmonization within organic agriculture. To which degree this is the case will depend, amongst others, on the particular product and the likelihood of benefits of harmonization going to producers or consumers (that is, responsiveness of producers and consumers to changes in prices); on their relative position in the market; their original direct and indirect costs as compared with other exporters; and the potential to reduce these costs with harmonization.

As always, the reliability of the results is greatly dependant on the quality of the data used. Much of this study is based on estimates and assumptions. As such, this study should be seen as an indication of the direction of gains and losses of harmonization in the organic guarantee system, rather than in absolute terms. The results from the modelling confirm the theory of gains and losses as set out in the early part of the paper.

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Abbreviations and Definitions

ARGENCERT:	C.O. Argentina
BCS:	C.O. Germany
BFA:	Biological Farmers of Australia (C.O. Australia)
Biokontroll:	C.O. Hungary
Bio Latina:	C.O. Peru, Colombia
Certimex:	C.O. Mexico
CIMS:	Centro de Inteligencia sobre Mercados Sostenibles
C.O.:	Certification Organization
Eco-Logica:	C.O. Costa Rica
EU:	European Union
FAO:	Food and Agriculture Organization (UN)
IBD:	Instituto Biodynamico (C.O. Brazil)
IFOAM:	International Federation of Organic Agriculture Movements
IMO:	Institut für Marktökologie (C.O. Switzerland)
ITF:	International Task Force (on Harmonization and Equivalence in Organic Agriculture)
JAS:	Japan Agricultural Standard
KRAV:	C.O. Sweden
NASAA:	National Association for Sustainable Agriculture, Australia (C.O.Australia)
Naturalis:	C.O. Slovakia
Naturland:	C.O. Germany
NOP:	National Organic Program (USA)
OCIA:	Organic Crop Improvement Association (C.O. USA)
SA:	Soil Association (C.O. UK)
SENASA:	Servicio Nacional de Sanidad y Calidad Agroalimentaria
TBT:	Technical Barriers to Trade
UNCTAD:	UN Conference for Trade and Development
WTO:	World Trade Organization