

**Multilateral Trade Liberalisation and Developing Countries: a North-South Perspective  
on Agriculture and Processing Sectors**

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Agricultural trade liberalization and developing countries: What do we really know?

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The views expressed in this paper are those of the authors and do not reflect the official view of the OECD or of the governments of its member countries.

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# 1. Introduction

This paper offers some reflections on the role of food processing in the global trading system, with particular reference to developing countries. It provides some points for discussion, rather than attempting to provide conclusive answers.

The paper addresses first of all the question of the relative importance of primary agriculture and processed food products in international trade. It then points to the observation that developing countries tend to specialize more in primary agricultural products, which see declining terms of trade over time. Diversification into processed products is an obvious way to mitigate declining terms of trade, but this is, amongst others, hampered by existing trade protection. To shed more light on the potential impact of multilateral liberalization across different developing countries, the paper addresses the question of heterogeneity amongst the group of developing countries. We argue that it is important to incorporate the pattern of the existing trade relations, and the related pattern of protection, of individual developing countries with 'North' into the analysis. Are countries exporters or importers of food, and if they are exporters, are there export products competing with those in industrialized countries? These are some of the questions that need to be answered in order to allow a balanced assessment of further multilateral liberalization in agriculture and food. We offer a classification scheme that incorporates income levels and the nature of the trade relation in agricultural and food products.

Using this classification scheme the paper shows that trade liberalisation in processed agricultural products has the potential to achieve big gains for some developing countries. At the same time the realization of this potential is conditional on compliance with food quality standards, both public and private, and therefore goes beyond the issues currently discussed under the Doha Development Agenda. Ultimately, 'market access' for farmers in developing countries will mean integration into globally operating supply chains.

## 2. Developing countries in global agri-food trade

What is the position of developing countries in the global agri-food trading system? In which markets are they participating as exporters and importers? What is the contribution of OECD trade- and agricultural policies to the terms of trade of non-OECD countries?

Figure 1 illustrates that trade in processed food products has grown significantly faster during the past four decades at 8.8% per year than trade in primary agricultural products which grew at an average of 5.8% per year.<sup>1</sup> Growth in processed products has especially outpaced primary products since the early 1980s.

A number of factors can be attributed to this development. With growing incomes consumer's taste tends to shift towards more processed products. At the same time improvements in international transport and logistics enables producers to reach consumers abroad. As producers try to add value to agricultural products, they shift towards processed products which are characterized by higher demand elasticities.

Another technological factor contributing to this trend is transport and shipping cost. The value per weight ratio is much higher and the perishability is often much lower for processed products. It is therefore often more profitable to ship processed products across long distances.

Breaking down the world into four broad country groups, Figure 2 shows that Africa and South America have declining or constant shares in the high growth processed markets. Only Asian

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<sup>1</sup> In Figures 1 – 3 primary agricultural products comprise the following GTAP commodities: Paddy rice, Wheat, Cereal grains nec, Vegetables, fruit, nuts, Oil seeds, Sugar cane, sugar beet, Plant-based fibers, Crops nec, Cattle,sheep,goats,horses, Raw milk, Wool, silk-worm cocoons, Processed rice, Sugar. Processed agriculture consists of: Animal products nec, Meat: cattle,sheep,goats,horse, Meat products nec, Vegetable oils and fats, Dairy products, Food products nec, Beverages and tobacco products. For a concordance between these categories and the ISIC and HS code please consult [https://www.gtap.agecon.purdue.edu/resources/res\\_display.asp?RecordID=454](https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=454)

developing countries have increased their share in world exports of processed products. A part of this increase is due to rising intra-regional trade, but they also have increased their exports to destinations outside the region. Clearly, Asian developing countries diversify their production and export of agricultural products more in recent years, which concurs with the universal stylized fact that a broader spectrum of product variety goes hand in hand with economic growth.

In line with the faster growth of trade in processed food, the share of primary products in total agri-food exports has declined for most regions over the past 4 decades, but it remains high for most developing countries, see figure 3. While for all developed economies together half of the export package in 1965 consisted of primary products, this share dropped to less than a third in 2002. African exports, in contrast, consisted for three quarters of primary products, and this share has dropped to only 60%. A similar pattern can be observed for South America, although this region has been slightly more successful in moving into processed products.

The picture emerging is that developing countries, as a group, tend to specialize in primary agricultural commodities. For some countries this might very well reflect their comparative advantage, but given the great number of countries with large diversity in endowments it is highly unlikely that the group of developing countries as a whole would find primary agriculture relatively more profitable than processing and manufacturing.

The specialization in primary products influences negatively the terms of trade, as the real world prices of bulk products remain on a declining trend. (FAO, 2005; OECD, 2005). Figure 4, from FAO State of Food and Agriculture, shows that agricultural terms of trade vis a vis manufacturing tend to decline worldwide, but developed economies slow the trend, while developing economies face more rapid deterioration. Why are the terms of trade declining more rapidly for developing countries?

One part of the explanation lies in the **product composition** effect that is already mentioned above. These countries tend to specialize in primary commodities with declining relative prices in the long term. High productivity growth in primary agriculture in combination with low demand elasticities must lead to falling relative prices. Developed country producers, in contrast, respond to declining agricultural prices by shifting to higher value processed products, which are also more elastic in demand.

Table 1, gives a nice illustration of the importance of primary and processed products for several groups of countries. The country grouping used is explained in more detail below. The weight of primary agricultural sectors is relatively high in low income countries, where the output share in the total economy varies between 16% and 18%, and gets smaller the richer the countries are. The output share in rich countries varies between 1% and 4%).

But there is also a **policy spillover effect**. In order to pursue a wide array of domestic policy objectives, rich countries continue to protect their agricultural markets through trade barriers. Import protection and export subsidisation further depress world prices, while stabilizing prices in rich-country markets, and adding to world price volatility.

Mitigating the negative contribution of trade policies to prospects of developing countries is at the heart of the current WTO Doha Development Agenda. The arguments sketched above point indeed towards a potential positive contribution of policy reforms, by reducing the harmful elements of policy spillovers. But the question is whether the arguments put forward can hold for all developing countries, individually and as a group, given that they are so diverse.

### 3. Country groupings

The interest of developing countries in multilateral trade negotiations is by no means homogeneous. The issues at stake depend not only on comparative advantage, but also on the existing structure of the economies, the structure of trade and the prevailing patterns of trade barriers. Of specific concern are the potential for development of the domestic agricultural sector and the potential to develop first- and second stage processing industries. Depending on the current and potential export package, specific developing countries will have an interest in improving access to specific developed country markets for primary products, while other countries will have an interest in improving access for their processed agricultural products. Yet other countries might not be worrying about market access, but are rather more concerned about maintaining low world food prices to reduce their import bills.

In order to structure the analysis and to avoid making overly simplified statements some grouping of countries must be undertaken. The ongoing WTO round of negotiations has seen the emergence of many coalitions, some more stable than others, and which can be assumed

to be based on common interests in the negotiations. One might therefore be tempted to group countries along those lines.<sup>2</sup> But since the formation of coalitions in negotiation games is usually driven by more factors than just the limited concerns that interest us here, we focus on country groupings that are more closely related to the relative importance of policy reforms in primary and processing agriculture.

Four systems to group developing countries are widely used, none of which is completely satisfactory for our purposes, see also Valdes and McCalla (1999) and OECD (2000) for a discussion of classification schemes.

The most straightforward system is that of the World Bank, which distinguishes countries according to their per capita income. Developing countries are Low Income Countries, Lower Middle Income Countries, or even Upper Middle Income Countries. An approach followed by the International Monetary Fund is based on the source of export earnings (IMF, 2000). An export-earning source is considered the main source if more than half of the export earnings of a country stem from the exports of only one product group<sup>3</sup>. Countries without a main export-earning source are classified as 'diversified'. The classification of the Food and Agricultural Organisation is based on trade positions in agriculture and food. The categories are Net Food Importing Countries, Net Food Exporting Countries, Net Agricultural Importing Countries, and Net Agricultural Exporting Countries. The United Nations (UN) defines four special cases of developing countries: Least Developed Countries, Low Income Food Deficit Countries, Transition economies, and Small Island Developing Countries. Furthermore, the UN classifies countries according to their regional distribution.

Diaz-Bonilla et al. (2000) develop a country classification that concentrates on one single issue. In their classification based on a formal statistical cluster analysis they explicitly consider food security issues.

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<sup>2</sup> For a formal statistical grouping of countries according to their positions on 13 negotiation issues see Lind (2002).

<sup>3</sup> The groups are: fuel, manufactures, primary products, and services/income/private transfers.

Van Meijl and van Tongeren (2001) propose an alternative multidimensional classification scheme to clarify the interests of groups of countries in trade negotiations. It is based on two main dimensions: 1) the level of development, and 2) the nature of the trade relation with developed (read: OECD) countries. The first dimension is assumed to be correlated with the economic structure and weight of the various sectors in the economy, and with the policy mix that a country may pursue. The second dimension in the Van Meijl and Van Tongeren classification is the nature of the trade relations, which should provide a first-order indication of the potential impact of trade liberalization. They take the following sub-dimensions into account:

The *net-trade position*: A country may be a net exporter or a net importer. In as far as trade liberalization results in the generation of greater trade volumes, exporting countries will benefit from freer trade. Next to the impact on volumes, the effects on their export revenues will depend on the development of world prices in the wake of trade liberalization. Both the level and the volatility of world prices are of crucial importance, especially in as far as a developing country depends on a very few commodities for its export earnings. It is generally thought that more liberal agricultural trade policies generate more stable world markets, while the price level can be expected to rise. For net importing economies, the anticipated impacts of further liberalisation of trade are more complex. It is generally accepted that a unilateral reduction of trade barriers would lead to lower domestic prices in the liberalising country, and will therefore benefit domestic consumers, while hurting domestic producers. In the context of multilateral liberalization of agricultural trade- and domestic policies, however, world food prices can be expected to increase which will be disadvantageous to the food trade balance of food importing countries. This is a special concern to the so called low-income food deficit countries

*Source of exports earnings*: Which sectors are responsible for export earnings: primary agricultural products, processed food products, unskilled manufacturing, skilled manufacturing or services? Countries which largely depend on primary agricultural commodities for their export earnings will put more emphasis on the agricultural dossier than, say, on liberalisation in services.

Another aspect is whether a country exports products that are *competing* with developed country products. Protective arrangements in developed countries exist primarily for

commodities which are produced in the same developed countries, while trade barriers for non-competing products vis a vis developing countries typically tend to be low already. Non-competing agricultural products may for example be tropical zone products that are not at all grown in developed countries (e.g. tropical fruits, tropical beverages), or it may be products that are grown in both tropical- and temperate climates but, the tropical exporter utilises a different seasonal pattern (e.g. cut flowers). It is especially in the area of competing products where tensions arise and where certain developing countries have an interest in achieving better access to high-income markets. The move from production and export of primary commodities towards more value added generating processing activities in developing countries is often hampered by protective measures in high-income countries, including tariff escalation.

*Preferential treatment.* A country may receive preferential treatment of its exports. Preferential access by developing country exporters tends to be concentrated in a few commodities like sugar, bananas and beef. This dimension indicates whether a general (global) reduction in MFN tariff rates may lead to a diversion of trade away from the countries that currently receive preferential treatment. This shift of trade patterns will especially be significant if the original preferential access is granted to a relatively high cost producer. See for example United Nations Economic Commission for Africa (2004) and Bouët, Fontagné and Jean (2006) for an analysis of the importance of preferences.

*Potential for self-sufficiency:* For net-importers of primary agriculture it matters whether they might be potentially self sufficient in the future or whether their comparative advantage lies outside agriculture entirely. In addition, large portions of agricultural activities in the least developed countries occur in subsistence production, which may only indirectly be affected by trade policy reforms as it is not integrated in the market system. However, the development of an infrastructure to support commercial farming could very well be fostered by trade liberalization.

## **4. Processing gains**



Using data on income per capita from World Bank, in combination with trade- and production data from FAOSTAT Van Meijl and Van Tongeren unambiguously classify 201 countries. They then proceed to condense this into a country aggregation that is suitable for numerical simulation analysis using the GTAP v5 database and a standard GTAP model implementation. see Figure 5 for the country grouping.

A main finding from the model simulations is that the income gains from liberalizing processed food outweigh the gains from liberalization in primary products. A reform of domestic and trade policies in primary agriculture alone would generate USD 17 billion global welfare gains (0.1% of world GDP), whereas reform in processed food sectors would add USD 28 billion, leading to a potential total gain from agricultural reforms of USD 45 billion (0.2% of GDP). Most of the welfare gains are concentrated in food importing developing countries, which could specialize in the processing of food. Even more opportunities for adjustment and higher economic gains are obtained from a broad policy reform that embraces all sectors including manufacturing and services. The potential income gains from broad reforms amount to USD 78 billion (0.3% of world GDP).

While the size of the estimated national income gains is far from impressive, the model simulations highlight some of the potentials and constraints for developing countries to move into processed agriculture. Table 2 illustrates this by reporting simulated production effects for primary agriculture and processing activities.

With reform of only primary agriculture, output contracts in EU and Japan (& NICs) for which the 1997 database recorded high levels of agricultural support linked to production. This contraction leads to an upward pressure on world prices through higher import demand and contracting exports by the EU. Developing country exporters, however, are not able to increase their market shares significantly, although some are expanding their production and exports as rising world market prices increase their profitability. Farmers in NAFTA and AUSNZL see better market prospects and are able to expand production. In NAFTA we see a shift from cereals to 'other primary' production, which comprises crops that are not supported to the same extent as the traditional program crops such as cereals. This leads to a positive growth in combined primary output in the NAFTA region increased exports and more fierce world market competition in this commodity group. As a result, world prices decline and

especially the low income exporters of primary agriculture are facing declining prospects for their largest export commodity group.

In terms of sectoral growth prospects, the most dramatic effects are simulated if trade barriers in the agri-processing industries are reduced on top of agricultural trade - and domestic policy reforms. To appreciate this result, it is helpful to realize that border protection is relatively high in these sectors. Consequently some shifts in trade and production can be expected, with high income country processing sectors declining and middle income countries expanding their processing sectors. This pattern is clearly visible in Table 2, and indicates possibilities for global relocations of processing industries.

In addition, primary production is expanding significantly in low- and middle income exporting countries -especially in Latin America, because they are able to benefit from the growth of domestic processing sectors as well as benefiting from improved export possibilities to other middle income countries that expand their processing sectors. Low-income primary exporters are also benefiting from this expansion of South-South trade, as they have close trade relations with middle income food exporters.

Finally, the comprehensive simulation illustrates some of the global shifts in production that might occur if trade in all sectors of the economy would be less exposed to barriers. Middle income developing countries which are currently exporting and which now also liberalize their own protected manufacturing industries specialize more in agriculture and agri-processing industries. Under a broad round of reform resources are freed from inefficient manufacturing industries in developing countries and move to agri-processing activities. Net importing developing countries, which also have limited potential to develop their agricultural sectors, are somewhat moving towards low-skilled manufacturing activities such as textiles.

Of course, the numerical analysis has a number of limitations that should not go unmentioned. The database is now somewhat outdated, with 1997 as its benchmark year. Since version 5 of the GTAP database great improvements have been made to the measurement of trade policies, which in the latest version 6 also encompasses an account for preferential arrangements and a refined measurement of TRQs, see Bouët et. al. (2004) In addition, the analysis has not taken into account the various domestic reforms and unilateral trade reforms that have taken place

since 1997 in some of the regions. See for example Francois et al (2005) and Anderson and Martin (2006) for simulations that take these and other aspects into account.

Nevertheless, and realizing that the analysis is necessarily broad-brushed in its policy details, it shows that there is great potential for some developing countries to diversify away from bulk agricultural commodities. It also points to the obvious fact that reforms will not benefit everyone.

## **5. Beyond tariffs: food quality and safety standards**

The picture painted above provides only a partial view of the potential for developing countries to reap the gains of more liberal trade in agro-food products. There are many obstacles to develop the supply capacity in developing countries, such as lacking infrastructure and communication, and imperfect factor markets, but here we zoom in on the food safety and quality standards. Consumers in industrialised countries demand safe food of guaranteed high quality and the food industry as well as public policy has responded to these demands through a variety of measures over the past 10 years (OECD, 2000). The objective of safe food consumption addresses agents and procedures along the entire food chain, from production and processing to marketing and control – in short, from farm to table.

Developing countries are generally more concerned with food security (i.e. there being sufficient nutrients available for the population) than food safety for consumers. However, from the developing country perspective, food safety issues have important implications for export opportunities to countries with a low risk tolerance. To reduce the intrinsic risk in the global trading of food and other agricultural products, these products are confronted with technical requirements at the multilateral, country and business level. There is concern that non-tariff barriers to trade (NTBs) related to food safety may systematically and substantially impede export performance of developing countries. See Dee and Ferrantino(2005) for a good inventory of the current state of affairs regarding the measurement of NTBs.

In a sense, developing countries are prone to being excluded from the optimization process regarding food safety measures: compliance with increasingly strict standards of food safety involves innovations and costs. Alternatively, in the case of non-compliance, exporters bear

costs in the form of a loss of market outlet, temporarily at the least but with likely long-term consequences. Food safety measures give rise to industrial organization issues of market and competition structure, as producers in developing countries are forced to adjust processes in the product chain to prevent a loss of trade.<sup>4</sup> Process changes are directed towards (1) compliance with multilateral and country-specific minimum safety standards in trade and (2) solving the information problem that arises when the extent to which food is safe is unobservable to buyers. It appears that adjustments in the food sector coincide with a trend towards integration of the product chain under retailer control. Safe production of safe food in developing countries appears to be unfavourable to smallholders. One reason is that decentralised supply may become an obstacle to solve information problems, one answer to which is traceability. ). The integration of smallholders in global supply chains will be a major challenge.

#### Mandatory standards and international rules

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<sup>4</sup> See Rau and van Tongeren (2006) for a formal and numerical analysis of the impact of compliance on industry structure, taking Polish meat trade with the EU15 as a case study.

The agreement on sanitary and phytosanitary (SPS) measures under the WTO serves as the main framework for the international regulation of food safety issues.<sup>5</sup> It governs the conditions for lawful risk reducing – but trade distorting – measures, and the settlement of disputes over these measures. SPS measures are shortly defined as “...regulations adopted by a nation to protect human, animal, or plant life and health within its territory from certain enumerated biological and toxicological risks” (Roberts *et al.*, 1999). Each WTO member may determine a level of acceptable health risk (or safety) and impose technical requirements on imports to maintain that level. It is required that such measures be justified with scientific assessment of the risk and imposed strictly to address this risk. By agreement, countries should acknowledge that various methods for food safety assurance could produce equivalent safeguards against health risks. Barriers imposed may cause disputes to arise in the multilateral trading system, and bilateral conflicts are brought before a Dispute Settlement Body under the WTO. Each country’s assessment of human, animal and plant health risks effectively determines the access of foreign food products to the domestic market. For that reason the WTO stimulates members to exchange information on risk and harmonise measures with one of three international advisory organisations: on animal health issues, the International Organization of Epizootics (IOE), on phytosanitary matters the International Plant Protection Convention (IPPC), and on issues with direct impact on consumer health the Codex Alimentarius Commission (Codex). Long-term goals of harmonisation and justification of food safety measures in trade under multilateral bodies should enhance the transparency of the multilateral trading system, reduce costs, and increase trade. The current reality is that global food safety regulation is one label to cover a multilateral consensus-agreement, a load of national rules and principles in the developed economy markets, and a strain for developing countries. Only to keep track of these processes requires substantial financial and human resources for negotiation committee delegates, Codex contact points, laboratory research etc; the actual setting of standards and shaping of rules are definitely

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<sup>5</sup> Other relevant requirements to food trade are defined in the former GATT agreement on technical barriers to trade (TBT), now under the WTO. The TBT articles stand to the SPS requirements as food quality to food safety: the latter regulates a scientifically defined element of risk in the former. Consequently, the SPS agreement effectively is more restrictive on food trade flows than the TBT agreement which regulates issues more or less confined to labelling, nutrition requirements, packaging and the like.

biased against developing countries. On grassroots level, reports from selected developing countries are that communication on technical requirements, if accurate, is often too complex and too technical to be used for guidance in ensuring compliance of exports with import requirements (see De Jager and Smelt, 2001; SADC, 2000)

#### Private food safety standards

Enterprises in the food sector have incorporated consumer concerns regarding health and quality into their production, marketing and distribution activities. The core of large retailers and trans-national “agribusiness” corporations has introduced various technical specifications that govern quality and safety of local and imported food products. Examples are the guidelines from EurepGAP, a European retailers convention, and British Retail Consortium. Insofar as these requirements or product standards relate to food safety, they usually do so within a broader concept of marketing differentiation and efficiency enhancement. (Reardon and Farina, 2002;). Private (or “voluntary”) food safety standards are at least in two ways related to official government measures and legislation. Private standards (a) tend to be more stringent than officially required, so as to stay abreast of public regulation;<sup>6</sup> (b) may be based on government indications, as is often the case regarding the labels on food products. Market power is crucial in determining what the standard will be – and to non-complying products little or no trade is left. In sum, increased value-added of safer food, enhanced market power and reduced costs may render it rational for private agents to address the health externality involved in food consumption with private safety standards.

Private standards also provide incentives to upgrade the industry through investments in capital and through raising competencies. Standards are likely to play an important role in shaping the food system by specifying not only process requirements, but necessitating new management systems that span across vertical as well as horizontal elements of the supply chain. (Fulponi, 2006).

#### Market access also means integration into globally operating chains

While food safety issues need not worsen agricultural export potential in developing countries, related reorganisations of the export supply chain, mostly induced by retailer

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<sup>6</sup> See, e.g., De Jager and Smelt (2001) for EU legislation on pesticide residues with effectively no impact on the Zambian export market because of the stringency of standards enforced by a large retailer.

consortia in developed economy markets, are likely to have a significant impact on rural labour and producer markets. It seems clear that private standards within the globally operating food chains do not work in favour of smallholders who will find it difficult to make the necessary investments to comply with those standards. Consequently, the international sourcing of food products is increasingly organised in tightly controlled vertical chains. Having access to the chain provides the ticket to export earnings for developing country farmers. On the other hand, access to markets also comprises access to local and domestic markets in developing countries. In spite of the global integration process, it is still the case that large portions of the rural population in developing countries are not connected to markets due to a variety of institutional and infrastructural impediments. Access to national markets for inputs, such as fertilizers, pesticides and seed, as well as access to output markets and access to labour markets has an enormous potential to improve the livelihoods of the poor in developing countries. Poor landowners can benefit either as independent producers, or as contracted producers or outgrowers. For growers with little access to land the growing activities are often part of a strategy to diversify sources of income (IFAD 2001). Especially horticulture seems to be a promising area for income earnings. Horticulture requires more handling than staple crops in order to accommodate for their more perishable quality and for often stronger quality requirements in the market. The processing, distribution and marketing of fruits and vegetables provides many low-skilled labour opportunities to the poor. Across the developing world unskilled women are favoured for these seasonal contracts, often at above-average wages.

In short, the concept of market access needs to be broadened beyond the narrow definition of reducing both conventional (tariffs and quota) and new (standards) barriers to international trade to include access to local and national markets in developing countries.

## **Conclusions**

Participation in this rapidly growing processed segment of agri-food trade has the potential generate increased export earnings for some developing countries. Diversification into processed food provides a way for those countries to avoid decreasing agricultural terms of trade. However, the current pattern of trade protection limits their ability to diversify, and multilateral trade policy reform can contribute to a global restructuring by providing an

improved set of incentives for countries to specialize according to their comparative advantage.

The impact of liberalisation differs among LDCs: in general terms lower levels of support to agriculture in industrialised countries will yield production and trade patterns that are more in accordance with comparative advantage. However, there is no reason to assume that all developing countries should have a comparative advantage in primary agriculture. With development the share of primary agriculture declines very fast.

A potential source of specialization gains arises from South-South trade, with some middle-income countries, especially in Asia becoming importing increasing amounts of bulk products for feed and processing purposes, while South American middle income exporters are becoming exporters of bulk products to serve the growing demand

The relatively recent emergence of tighter food safety and quality standards appears to be an obstacle for the integration of developing country smallholders in global markets, but this need not necessarily be the case, because these standards also provide an incentive to upgrade the industry through investments in physical and human capital. Poor landowners can benefit either as independent producers, or as contracted producers or outgrowers.

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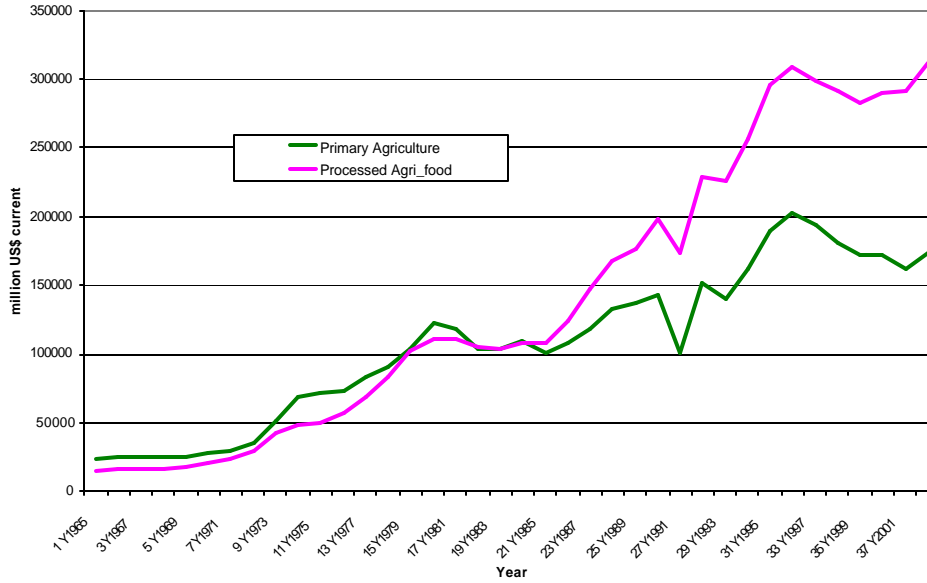
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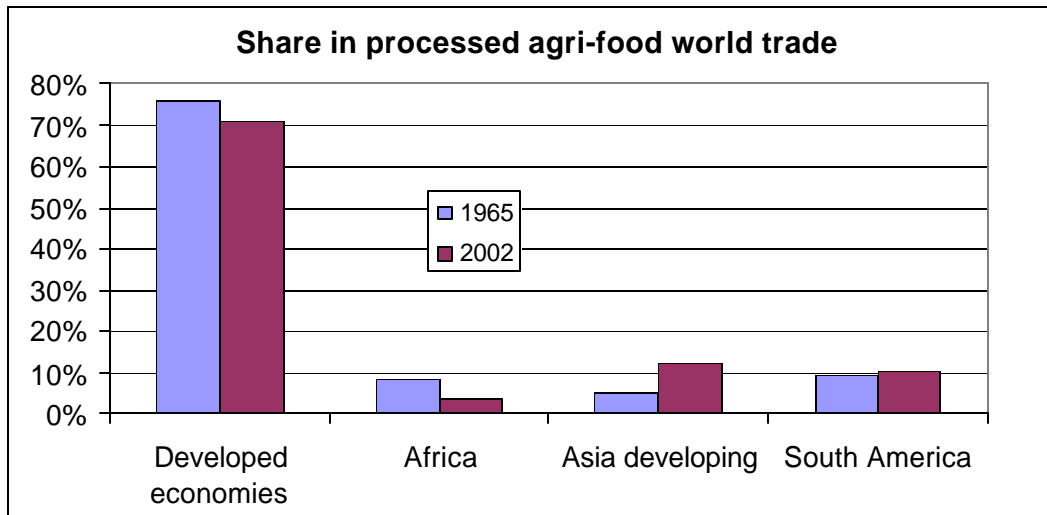
**Van Tongeren & van Meijl IAAE 2006, Tables and Figures**

Figure 1: Development of trade in primary and processed agriculture



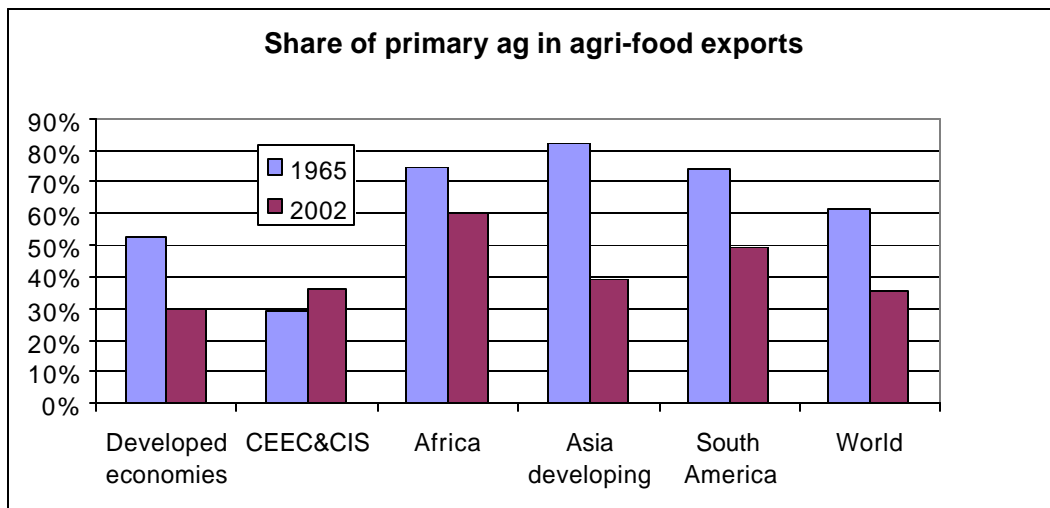
Source: GTAP v6, author's calculations

Figure 2: Regional share in processed agri-food world trade. %



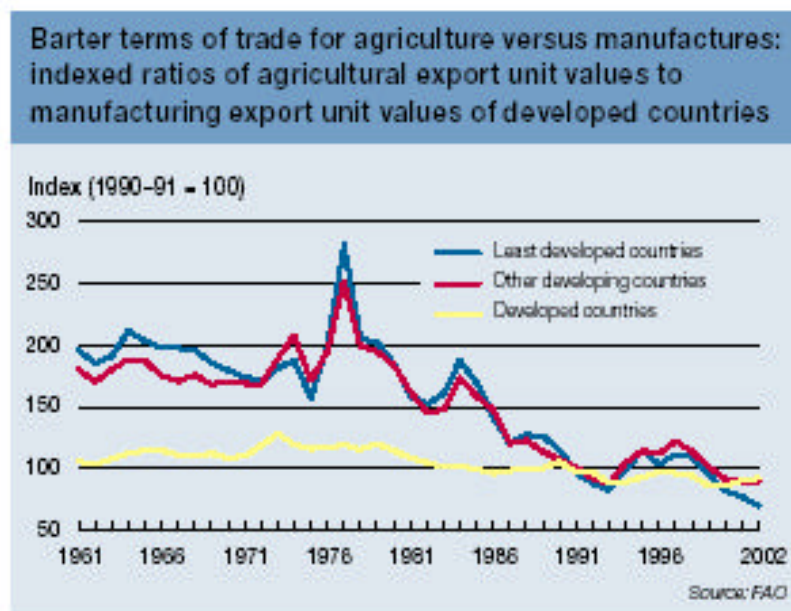
Source: GTAP v6, author's calculation

Figure 3: Regional share of primary agriculture in total agri-food exports, %



Source: GTAP v6, author's calculation

Figure 4: Terms of trade





Level of development				
Trade relation	Level of development			
	Low Income Countries	Lower Middle Income Countries	Lower Middle Income Countries	High Income Countries
Net-exporters of both primary agriculture and processed food	Vietnam India Zimbabwe Zambia Malawi Mozambique LIEXP	<i>Rest Andean pact</i> Argentina Uruguay Brazil Botswana MIEXP	Chile Hungary MIEXP	Australia New Zealand France Canada Denmark Ireland Netherlands
Net-exporters of primary agriculture and Net-importer of processed food	Tanzania Uganda <i>Rest of Sub-Saharan Africa</i> LIAEXP	Sri Lanka Columbia <i>Central America</i> <i>Rest of South America</i> FSU MIAEXP	<i>Rest of Sacu (RSA)</i> MIAEXP	US Greece Spain
Net-importers of primary agriculture and Net-exporter of processed food		Indonesia Thailand Peru Morocco	Malaysia Turkey MIFEXP	Belgium & Luxembourg <i>Rest of Efta</i>
Net-importers of both primary agriculture and processed food, potentially self-sufficient	Bangladesh <i>Other Southern Africa</i> <i>Rest South East Asia</i> LIIMP	China Philippines <i>Rest Middle East</i> <i>Rest North Africa</i> LMIIMP	Mexico(I) Venezuela Poland <i>Rest of CEEC</i> UMIIMP	Italy UK Korea Taiwan Switzerland Germany Portugal Sweden Finland
Net-importers of both primary agriculture and processed food, not potentially self-sufficient				Hong Kong Japan Singapore

Figure 5: Country grouping

Table 1: Shares in value of output 1997, %

	Low income				Lower-Middle income					Upper-middle income	High income					
	net exporter prim & proc liexp	net exporter prim & proc India	net exporter prim, net importer proc liaexp	net importer prim & proc lilmp	net exporter prim & proc Miexp	net exporter prim, net importer proc Miaexp	net importer prim, net exporter proc mifExp	net importer prim & proc LMlmp	net importer prim & proc China	net importer prim & proc umilMP	net importer prim & proc JPNNIC	net exporter prim & proc ausnzl	net exporter prim & proc NAFTA	net exporter prim & proc EU15	net importer prim & proc ROW	Total
Food-grains	3.5	5.4	3.6	5.5	0.6	0.5	1.7	1.1	2.4	0.4	0.3	0.4	0.1	0.2	0.7	0.5
Feed-grains	1.4	0.9	1.4	0.6	0.4	0.3	0.5	0.4	0.7	0.5	0	0.2	0.3	0.1	0.3	0.3
Oil-seeds	0.2	2.9	0.5	1.6	0.6	0.2	0.3	0.1	0.2	0.1	0	0	0.1	0.1	0.2	0.2
AnimalPrim	1.4	5.2	2.8	4	2	1.7	2.1	2	3.7	2.9	0.4	1.6	0.9	1.2	2.2	1.3
OtherPrim	12	6	8.4	5.3	3.2	2.2	4	2.5	4.4	2.3	0.7	1.5	0.6	0.7	1.8	1.3
Total primary agriculture	18.5	20.4	16.7	17	6.8	4.9	8.6	6.1	11.4	6.2	1.4	3.7	2	2.3	5.2	3.6
AnimalProc	1.1	0.3	0.9	0.3	2.7	1.9	1	1.4	0.6	2.8	0.7	2.5	1.5	2	2.5	1.5
Sugar	0.4	1.7	0.6	1.4	0.7	0.4	0.5	0.6	0.2	0.4	0.1	0.3	0.1	0.2	0.3	0.2
OtherProc	8.2	2.7	10.4	6.8	5.7	4.5	7.3	4.6	4.9	6.7	3.8	2.9	3.1	3.3	5	3.8
Total agriculture	9.7	4.7	11.9	8.5	9.1	6.8	8.8	6.6	5.7	9.9	4.6	5.7	4.7	5.5	7.8	5.5
Textiles	7.8	8.9	3.4	11.7	4.9	3.4	5.5	3.4	7.8	5	2.1	1.6	2	2.1	2.2	2.8
Extraction	5.6	2.4	10.6	5.7	3	5.9	4.3	10.7	4	5.2	0.7	4.2	1.6	0.7	3.5	2
Manufacturing	15.9	22.4	10.9	13.6	29.7	26.1	27.2	21.9	37.9	28.5	30.9	18.6	26.2	27.8	24.9	27.7
Services	42.8	41	46.6	43.4	46.5	53	45.5	51.4	33.3	45.3	60.4	66.3	63.6	61.6	56.4	58.5
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: GTAP v5, author's calculation



Table 2: Output effects from 50% cuts, percent change from base

Income and country group label	Trade characteristic	Reform primary agriculture		Reform primary and processed		Reform all sectors	
		Primary Agriculture	Processed	Primary Agriculture	Processed	Primary Agriculture	Processed
<b>Low income</b>							
Liexp	net exporter prim & proc	1.1	-1.3	1.2	1.2	-0.1	-1.4
India	net exporter prim & proc	0.6	-1	1.1	9.5	1.6	10.3
Liaexp	net exporter prim, net importer proc	-0.7	0.3	-0.7	-0.3	-0.2	0.4
Limp	net importer prim & proc	-0.7	0.4	-1.1	-3.9	-0.7	-3.7
<b>Lower-Middle income</b>							
Miexp	net exporter prim & proc	1.4	-0.5	2.2	2.2	2.4	2.5
Miaexp	net exporter prim, net importer proc	0	0.2	0.5	1.4	0.7	1.8
Mifexp	net importer prim, net exporter proc	-0.2	0	0.2	2.5	-1.1	-0.2
Lmiimp	net importer prim & proc	-2.1	1.4	-3.7	-7.8	-4.2	-8.3
China	net importer prim & proc	-0.1	0.5	-0.2	-1.6	0.2	-1.9
<b>Upper-Middle income</b>							
	net importer prim & proc	-0.2	0.6	0	-0.2	-0.2	-0.2
<b>High income</b>							
Jpnnic	net importer prim & proc	-3.3	1.7	-4.7	-1.7	-5.1	-1.9
Ausnzl	net exporter prim & proc	2.2	-1	5.4	8.5	6.2	9.3
Nafta	net exporter prim & proc	0.8	-0.2	1.3	1	1.5	1.2
EU	net exporter prim & proc	-1.6	-0.3	-3.8	-3.1	-3.4	-2.8
Row, Lower-Middle income	net importer prim & proc	-1.9	2.1	-2.9	-1.7	-2.8	-1.6

Source: author's simulations, GTAP v5

Notes: the simulations reduce the ad valorem equivalents of policy instruments by 50%.