



AFRICAN, CARIBBEAN AND PACIFIC GROUP OF STATES'
AGRICULTURAL TRADE
AND THE WORLD TRADE ORGANIZATION NEGOTIATIONS





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United Nations publication issued by the United Nations Conference on Trade and Development.

UNCTAD/DITC/TNCD/2015/6

NOTE

All references to dollars (\$) are to United States of America dollars unless otherwise stated.

For further information on the Trade Negotiations and Commercial Diplomacy Branch, please contact:

Ms. Mina Mashayekhi
Head
Trade Negotiations and Commercial Diplomacy Branch
Division of International Trade in Goods and Services, and Commodities
Tel: +41 22 917 56 40
www.unctad.org/tradenegotiations

ACKNOWLEDGEMENTS

This publication was prepared by Mina Mashayekhi, Head, Trade Negotiations and Commercial Diplomacy Branch, Division on International Trade in Goods and Services, and Commodities (DITC), UNCTAD; David Vanzetti, Agricultural Economist, Visiting Fellow, Crawford School of Public Policy, Australia National University; Taisuke Ito and Luisa Rodriguez, Economic Affairs Officers, Trade Negotiations and Commercial Diplomacy Branch, DITC, UNCTAD.

Laura Moresino-Borini designed the cover and performed the desktop publishing.

ACRONYMS

ACP	African, Caribbean and Pacific Group of States
AMS	aggregate measure of support
AoA	Agreement on Agriculture
ASEAN	Association of Southeast Asian Nations
CGE	computable general equilibrium model
DITC	Division on International Trade in Goods and Services, and Commodities
EFTA	European Free Trade Association
GTAP	Global Trade Analysis Project
IMF	International Monetary Fund
LDC	least developed country
MFN	most-favoured nation
NAMA	non-agricultural market access
n.e.c.	not elsewhere classified
n.e.s.o.i.	not elsewhere specified or indicated
RAM	recently acceded member
SITC	Standard International Trade Classification
SSM	Special Safeguard Mechanism
SVE	small, vulnerable economy
TRAINS	Trade Analysis and Information System
WITS	World Integrated Trade Solution
WTO	World Trade Organization

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**THE CURRENT CONTEXT OF
AGRICULTURE NEGOTIATIONS OF
THE WORLD TRADE ORGANIZATION AND
CHANGES TO THE AGRICULTURAL TRADING
ENVIRONMENT**

A. CAN THE DOHA NEGOTIATIONS BE REVIVED?

The long-running World Trade Organization (WTO) Doha negotiations remain unresolved. The stumbling block in 2008 was the intransigence of the United States of America over domestic support and the G-33' position on the creation of a safeguard, accessible for developing countries, against import surges and depressed prices (Special Safeguard Mechanism (SSM)). Since 2008, further issues have arisen outside of agriculture, and negotiators appear further from an agreement now than they were then.

Members agreed in 2008 to make linear tariff reductions within bands, but proposed exemptions for sensitive products; while providing for much needed flexibility, this threatened to undermine the reduction of tariffs. Ironically, the greater the reduction of tariffs is, the greater is the potential of exemptions for sensitive products to undermine that reduction. On the other hand, it has repeatedly been shown that WTO members require some flexibility to protect politically sensitive sectors.

Analysis at the time suggested that although developing countries as a group would benefit from the proposed reductions in tariffs, domestic support and export subsidies, the benefits were not evenly distributed. Indeed, many African, Caribbean and Pacific Group of States (ACP) countries were likely to become worse off as the result of loss of preferential access as most-favoured nation (MFN) tariffs were lowered. In addition, the rising price of temperate products would raise the costs of imports, worsening their terms of trade from two directions.

Since 2008, the trading environment has changed. Agricultural prices have risen substantially, and some international institutions have predicted a reversal of the long-term downward trend. Rising prices have led to a concern about food security, and this in turn has furthered discussion about domestic support and subsidies for public stockholding of grain. The United States appears to have bolstered domestic support for agriculture through its crop insurance programme, particularly if prices fall (*Bridges Weekly*, 2014), and public stockholding was an important issue for discussion at the Bali Ministerial Conference in 2013.

A further development since 2008 has been the prominence of regional trade agreements. This has led to a further erosion of preference for ACP countries.

Emerging markets, such as Brazil, China, India and South Africa have become more prominent in international trade. An emerging middle class in China has increased the demand for high protein foods and the feed necessary to produce it. Brazil and India are more prominent exporters. This is not only important for the non-agricultural market access (NAMA) negotiations, but also for agriculture. Developing countries are trading more with themselves than previously.

Finally, in an effort to revive the negotiations, there have been new proposals put on the table. For agriculture, this includes going back to the simplified Uruguay Round formula as opposed to the four-tier approach, reflected in the latest modalities draft, from December 2008. The Uruguay Round formula specified an average and minimum tariff cut. One formula, proposed by Paraguay, in March 2015, entails an average cut of 36 per cent with a minimum cut of 15 per cent for developing countries. Developed and developing country groups would have different linear reductions consistent with special and differential treatment. Member countries would choose which products would enjoy the minimum tariff reductions. This approach has the virtues of simplicity and flexibility, but the downside is that tariffs are reduced less and there is a lack of transparency. In particular, developing countries do not know which markets would attract the minimum cut as opposed to an above-average tariff reduction.

In this paper, we examine the formula proposed in the 2008 draft modalities and compare it with the one proposed by Paraguay in March 2015. We attempt to take into account how the world has changed since 2008, by looking at the changes in tariffs facing ACP countries, in agricultural prices and in domestic support. We then examine proposed tariff cuts at a six-digit level. Next, the initial and final tariffs are aggregated to 24 sectors and analysed within a well-known general equilibrium model, the Global Trade Analysis Project (GTAP), to assess the impacts on welfare and trade flows for ACP countries. We conclude with recommendations for ACP countries in the WTO negotiations.

B. THE NEGOTIATIONS SO FAR

Revision 4 of the Revised Draft Modalities for Agriculture (WTO, 2008) specified linear cuts within four bands, with the higher tariffs attracting greater reductions. Developed and developing country groups would have different thresholds and linear reductions. Members also agreed on the need for exemptions for so-called sensitive and special products, and a safeguard mechanism was specified to protect against import surges and depressed prices.

In fact, the Hong Kong Ministerial Declaration acknowledges the need “to agree on the treatment of sensitive products” (WTO, 2005, paragraph 7), which would be subject to lower tariff cuts than specified by the formula.³ Proposals for the number of sensitive products ranged from 1 per cent (G-20 and the United States) to 15 per cent (G-10) of tariff lines. The United States proposed a very low number of tariffs (1 per cent), as it maintained its exporters require a real improvement in market access if they are to forgo domestic support as called for by other members. The G-10 group of agricultural importers, which had and still have high tariffs, pressed for a high proportion of sensitive tariffs and lower reductions. The G-20 group of developing countries, which includes Brazil, China and India, took an offensive position on the agricultural tariffs of developed countries. The G-33 group of developing countries with defensive interests focused on flexibilities for developing countries. ACP countries generally took a defensive position. Many of these countries had preferential access for exports of agricultural products such as bananas, beef and sugar into the European Union and were reluctant for forgo these preferences. However, revision 4 of the Revised Draft Modalities specifies a range for sensitive products of 4–6 per cent for developed countries and one third more for developing countries (WTO, 2008). Countries would be able to designate their own products. Sensitive products would not be totally exempted from tariff reductions, and countries that made use of such exemptions would be required to provide additional access in some alternative fashion such as increasing the import or tariff rate quota where these exist.

In the Uruguay Round, flexibility was accommodated by allowing countries to reduce some tariff lines by only 15 per cent as long as the average cut exceeded 36 per cent. The cuts were unweighted, so a 15 per cent

cut on an initial tariff of 100 per cent could be offset, for example, by a 57 per cent cut on a 10 per cent initial tariff. As a result, the improvement in market access was a lot less than it appeared initially. Agricultural exporters are keen to avoid this being repeated in the current round, while, on the other hand, importers are keen to retain such flexibility.

On domestic support, members agreed on the need to move away from trade-distorting support, although there have been difficulties in defining, measuring and monitoring the various types of support. Several countries decoupled their support by providing direct payments unrelated to current production, although this tended to lock in distortions rather than remove them. Domestic support fell during the period of high agricultural prices around 2008, but has risen more recently with the easing of prices. In 2012, total domestic support was around 35 per cent of the value of production in the United States, 24 per cent in the European Union and 33 per cent in Japan (WTO, 2015a). In contrast, in the 2000s China had total support levels ranging from 10 to 13 per cent, Brazil from 5 to 10 per cent and India from 13 to 23 per cent. Although support has tended to switch from the trade-distorting amber box to the non-distorting green box, the bound level remains significant and some developing countries are pressing for more restraint on domestic support in agriculture in developed countries as a condition of reducing industrial tariffs.

Perhaps most contentious is the United States domestic support as reflected in the United States Farm Bill of 2014. There appears to be a significant switch away from green-box back to amber-box policies. Direct income support has been removed and there is a greater reliance on countercyclical payments where lower prices imply greater subsidies. In addition, crop insurance programmes involve a subsidy worth about 4 per cent of the value of production. However, most analysts consider it unlikely that the United States would exceed its current aggregate measure of support (AMS) cap of \$19.1 billion over the 2014–2018 period covered by the legislation (Smith, 2014). The revision-4 target of \$7.6 billion for the United States might present more of a problem, depending on whether various policies are classified as amber or green box and whether prices remain high. The change in policies may make it more difficult for the United States to negotiate a significant tariff reduction agreement at WTO.

More recently, increasing concerns about food security and the need for Governments to procure public stocks of grain contributed to an impasse at the 2013 Ministerial Conference in Bali (WTO, 2013). The question is whether WTO Agreement on Agriculture (AoA) rules and commitments on domestic support should be modified so that developing countries are not unduly constrained in ensuring food security. Members agreed on an interim solution in Bali and to search for a permanent solution by December 2017. The options have been surveyed by Matthews (2014): one is to make the interim solution permanent and available to all developing country members, but this is unlikely to be acceptable; another is to adjust for inflation to narrow the difference between the administered (domestic) price and the external reference price. A third option is to increase the de minimis level of support. Another option is to change

the definition of what production is considered eligible. Finally, a further option is to provide an input subsidy to poor farmers, a green-box measure. There are various objections to each of them.

The third pillar is export competition, which covers export subsidies and export credits, guarantees and insurance, state trading enterprises, food aid and export restrictions. Members appeared to agree on the need to eliminate export subsidies, although their importance has diminished greatly in recent years because of rising prices and other policy changes. Most significant are the European Union subsidies on sugar and dairy products. The European Union agreed to phase these out if the Round was successfully concluded. Export credits remain an issue for the European Union. State trading enterprises and food aid are somewhat peripheral to the negotiations and do not occupy centre stage.

Recent developments in agricultural negotiations

The 10th WTO Ministerial Conference (MC10) held from 15-19 December 2015, Nairobi, Kenya, adopted four decisions on agriculture respectively on (i) export competition including the elimination of export subsidies; (ii) public stockholding for food security purposes; (iii) special safeguard mechanism (SSM) for developing countries; and (iv) cotton.⁴ The most significant of these decisions was that on the elimination of agricultural export subsidies, even though the use of such measures had significantly decreased since 2001. The Decision generally provides for the immediate elimination of remaining export subsidy entitlements for developed members and the elimination in three years by 2018 (or by 2022 for certain subsidies) for developing countries. Given the fact that the use of export subsidies has already decreased significantly, the immediate gains from this Decision would appear limited. While some export subsidies still remain mainly in EU and Korea and on a few products such as sugar and dairy, EU had already offered to eliminate these subsidies in any event once there was a negotiated outcome.

The Decision on SSMs reaffirms that developing country Members will have the right to have recourse to a SSM as envisaged under paragraph 7 of the Hong Kong Ministerial Declaration. The Ministerial Decision reflects the proponents' concern over ensuring the continued relevance of SSM in future agriculture negotiations whatever format it takes. These proponents sought to delink the discussion of SSM from agricultural market access negotiations so that developing countries are entitled to the SSM independent of a market access outcome. Similar to the Decision on SSM, the Ministerial Decision on public stockholding reaffirms the existing Bali and related decisions on protecting developing-country Governments which buy stocks of food from their farmers for food security purposes from legal challenges (i.e., "peace clause") until a permanent solution is agreed. The Decision again reflects the proponents' desire to ensure continued negotiations on this matter irrespective of the Doha Round prospects.

The Ministerial Decision on cotton contains commitments relating to three pillars of agriculture, namely market access, domestic support, export competition, as well as development component. The most significant of all, building upon the Ministerial Decision on export competition, Ministers agreed to end cotton export subsidies in developed countries immediately and in developing countries by 1 January 2017. Commitments in other pillars are rather weak. The Decision imposed no new additional reduction on domestic support, the major trade-distorting element of the cotton trade. The US domestic support seems to be reduced compared to 2008 although some emerging economies have still significant subsidization.

Post-MC10 discussions in 2016-2017 have focused on the implementation of the above Ministerial Decisions, including on food security, domestic support and export competition. For instance, Australia became the first country to have taken steps in early 2017 to eliminate its export subsidy entitlement according to the MC10 decision. However, progress in other key areas, such as permanent solution on public stockholding SSMs and cotton, remain limited. Agriculture issues are expected to be part of the deliverables for the eleventh WTO Ministerial Conference scheduled for 11-14 December 2017, Buenos Aires, Argentina. This is expected to include public stockholding, domestic support in general and cotton in particular, and SSM. Other issues suggested for discussion include export restrictions.

Export restrictions are a source of concern for some WTO members, but discussions on this matter in WTO have led towards possible future disciplines with regard to transparency (that is, enhanced notification obligations for using such restrictions). Other types of rules do not appear to be feasible given the lack of consensus among WTO members in this area. For instance, many countries believe export restrictions are not as serious as import restrictions in terms of their affect on trade. Many see these measures as a tool to achieve legitimate policy objectives such as reducing price volatility in domestic markets; securing fiscal revenue; promoting domestic processing industries (particularly when importing developed countries charge higher tariffs on processed products than on raw materials – “tariff escalation”); limiting

overexploitation of the domestic environment; protecting endangered species; and controlling the trade of weapons and dangerous materials and substances.

In summary, the WTO negotiations have not kept up with the changes in the trading environment. Emerging economies have a greater role. Agricultural prices have risen. Food security is seen as more important. As tariffs have been reduced through a proliferation of regional trade agreements, non-tariff barriers have become more important. Domestic support has switched into the green box, but total support remains significant and is increasing in developing countries. Export subsidies have diminished in importance. Export restrictions are a source of concern for some WTO members.



**THE NEW TRADING ENVIRONMENT FOR
THE AFRICAN, CARIBBEAN AND PACIFIC
GROUP OF STATES**

A. THE CHANGING POSITION OF ACP COUNTRIES

In this section we describe the current trade patterns and the existing barriers facing ACP countries.

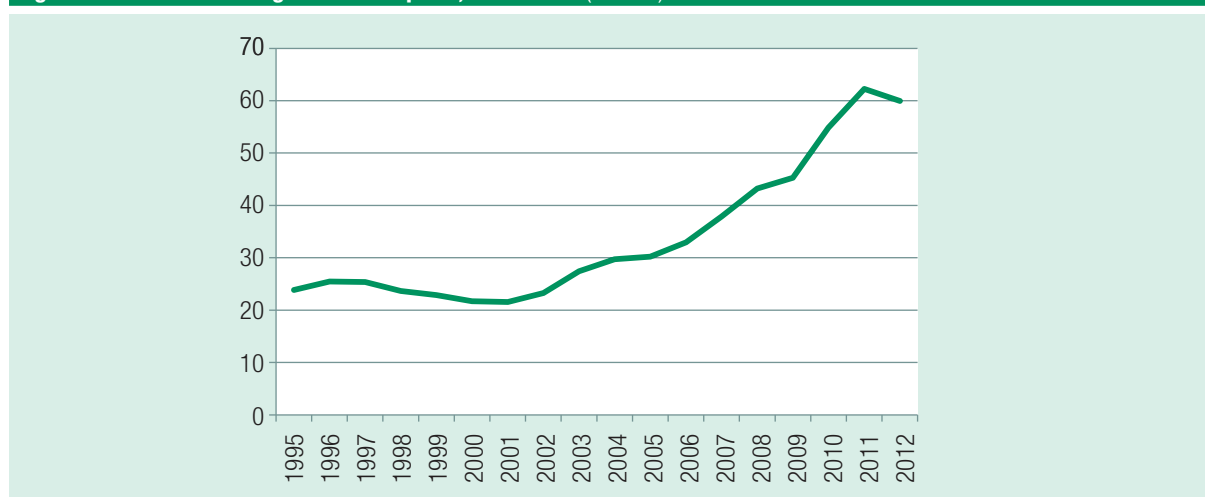
1. Trade patterns

Agricultural exports from ACP countries (figure 1) have increased threefold since 2000, but their share of world agricultural exports has in fact declined since 1995 from 4.0 per cent to 3.6 per cent in 2012. This is because world agricultural trade has grown faster than ACP exports.

As non-agricultural commodity prices and exports have risen, the role of agricultural exports has declined. The share of ACP agricultural exports in total merchandise exports has halved since 1995 (figure 2) and is currently around 12 per cent. This is largely attributed to the exports of oil, which increased tenfold from \$24 billion in 1995 to \$267 billion in 2012. Crude oil prices increased more than fivefold from 1995 to 2012, but have fallen by half since June 2014. Current prices are \$63 a barrel, well down from the peak of \$144 in June 2008.

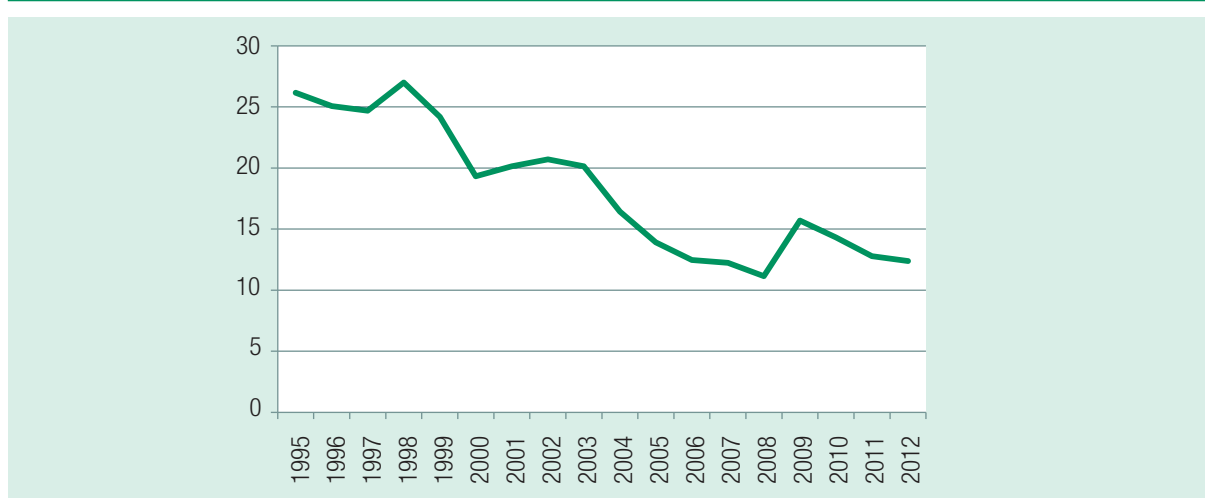
Agricultural exporters and importers of ACP have been greatly affected by price instability. The

Figure 1. Growth in ACP agricultural exports, 1995–2012 (Billions)



Source: UNCTADstat online. Agriculture is defined as “agricultural raw materials” (Standard International Trade Classification (SITC) 2 less 22, 27 and 28) and “all food items” (SITC 0 + 1 + 22 + 4). This is not identical to the WTO AoA definition.

Figure 2. Share of ACP agricultural exports in total merchandise exports, 1995–2012 (Percentage)



Source: UNCTADstat online.

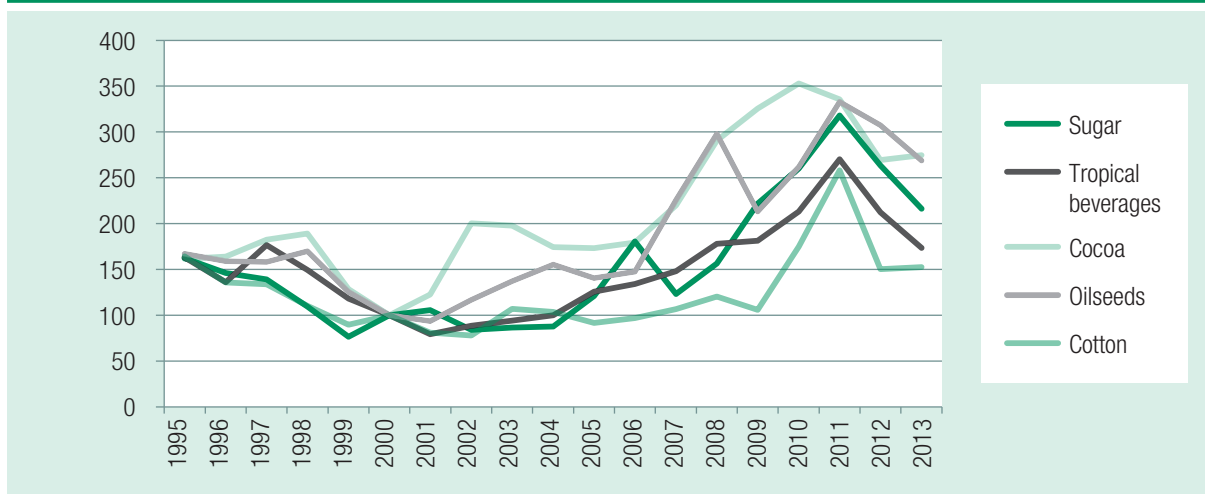
major ACP agricultural exports are cocoa, cotton, coffee, sugar and oilseeds. From the perspective of exporters, prices of tropical agricultural exports have risen since the early 2000s, as figure 3 shows. This led some international institutions, such as the Food and Agriculture Organization of the United Nations, to forecast higher prices in the foreseeable future. However, prices have moved down since 2011, broadly in line with falling crude oil prices.

While rising agricultural prices are generally beneficial for exporters, many ACP countries are net food importers, and most are importers of temperate products such as wheat, rice, meat, dairy products

and sugar.⁵ Food prices peaked in 2008 and again in 2011 (figure 4) but fell in 2014. The International Monetary Fund (IMF) forecasts that the food price index will fall 14 per cent below 2014 levels by 2020.

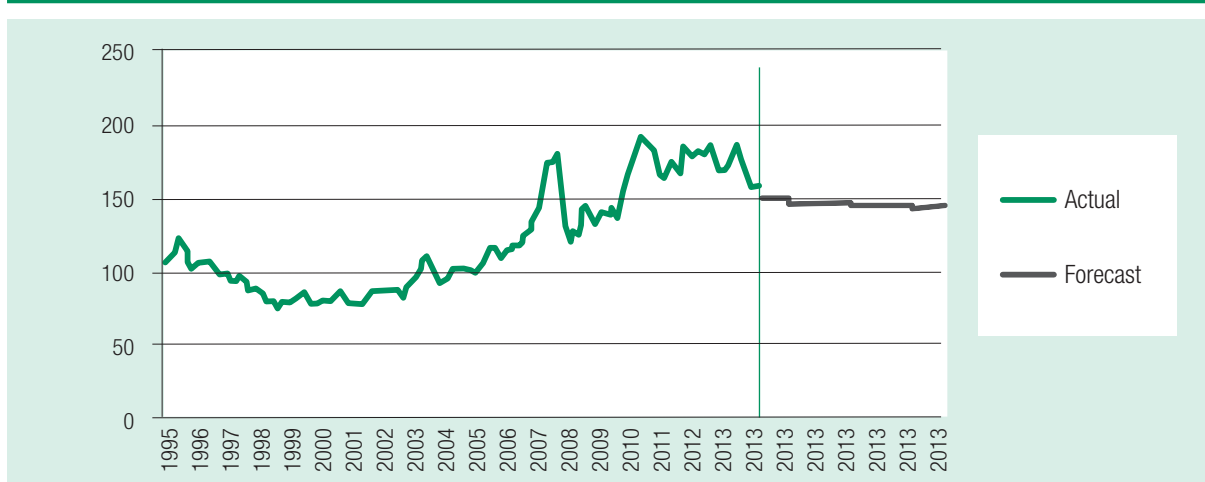
Many African members of ACP have benefited from the non-food commodity boom. The IMF all-commodity price index rose threefold from 2000 to 2012. However, in the past two years the index has fallen 35 per cent. Energy has a large weight in the commodity price index, reflecting the value of production. Oil prices are expected to fall further in 2015 but rise moderately until 2020. As with food, non-food price movements benefit some ACP countries at the expense of others.

Figure 3. Price indices of selected tropical agricultural exports, 1995–2013



Source: UNCTADstat online. Index 2000 = 100.

Figure 4. Food price index, 1995 to 2014 and forecast to 2020



Source: IMF food price index, 2005 = 100; includes cereal, vegetable oils, meat, seafood, sugar, bananas and oranges price indices (http://www.imf.org/external/np/res/commod/External_Data.xls).

Angola and Nigeria are major oil producers in Africa. Trinidad and Tobago in the Caribbean is a significant exporter of liquid natural gas. Numerous African countries are exporters of minerals such as gold, diamonds, copper and nickel.

2. Tariffs on ACP importers

Tariffs on ACP agricultural imports have fallen steadily since many ACP members joined WTO in 1995. The average effectively applied tariff for ACP countries as a group was 29 per cent in 1995 and is presently around 13 per cent (figure 5).

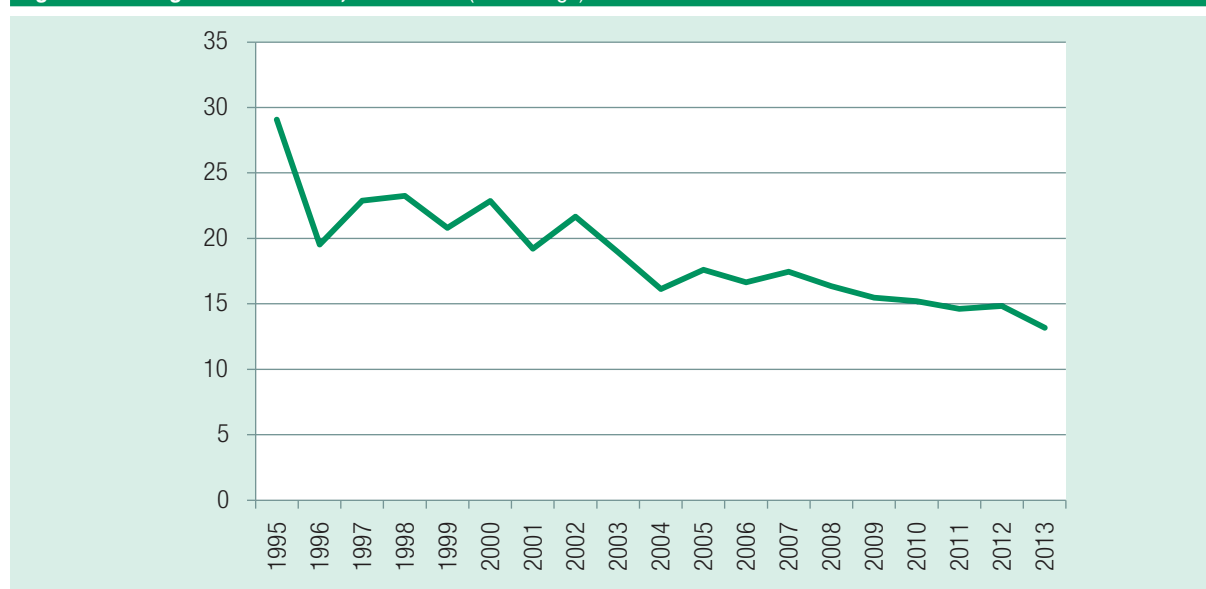
Currently, regions within ACP with the highest applied tariffs are East Africa and the Pacific. East African countries have high tariffs on agricultural imports from China, the Republic of Korea and several other ACP regions, while the Pacific group of ACP countries maintains high tariffs on imports from most countries

with the notable exception of the European Union. Perhaps as a result, trade between these regions is low. Bound rates are very high – over 70 per cent on average for ACP agricultural imports. These are shown for various agricultural sectors for the six ACP regions in figure 6. Bound rates have not changed greatly since 1995. Figure 6 also shows the gap between bound and applied rates. Most ACP countries would appear to have sufficient space to reduce their highest bound tariffs by 47 per cent without impinging on their applied rates.

3. Tariffs facing ACP exporters

Tariffs facing ACP agricultural exports have also fallen in recent years (table 1). Currently, tariffs on agricultural exports to the European Union, Japan and the United States are rather low, with the exception of Southern

Figure 5. ACP agricultural tariffs, 1995–2013 (Percentage)



Source: UNCTAD Trade Analysis and Information System (TRAINS) via World Integrated Trade Solution (WITS) databases. These are simple effectively applied tariffs using the WTO definition of agriculture and methods of calculating ad valorem equivalents.

Table 1. Tariffs facing ACP agricultural exports (Percentage)

	2008	2011	2014
Bound	55.4	65.2	32.2
MFN	13.3	13.9	10.1
Preferential	9.7	8.7	4.0

Source: WTO Integrated Database via WITS.

Figure 6. ACP agricultural tariffs by sector, 2011 (Percentage)



Source: GTAP database version 9.

African exports to Japan. However, ACP exports to the Republic of Korea, particularly from the Southern African and Caribbean regions, face significant border protection. China imposes 76 per cent tariffs on sugar imports from some Caribbean countries, and India imposes barriers of 100 per cent or more on agricultural imports of, for example, alcohol, coffee and edible offal of fowl from all ACP regions.

The main market for most ACP countries is the European Union. Given the European Union's multitude of preferential trade arrangements, the existing tariffs on agricultural imports are relatively low, less than 1 per cent for West, Central and East Africa and the Pacific, and about 3 per cent for Southern Africa. However, Pacific countries face a higher tariff of around 10 per cent. The main agricultural export for ACP countries to the European Union is sugar. The European Union has high tariffs on imports, up to €419 per ton, although ACP countries have preferential access under a quota system. In 2017, the quotas and tariffs are scheduled to be removed and ACP countries will face competition from low-cost producers such as Brazil. According to European Union estimates, sugar imports from ACP countries may drop by 43 per cent (see Burrell et al., 2014).⁶

Low average tariffs may hide a number of tariff peaks. Some of these can be very large. For example, the European Union has a tariff on whey (HS 0404106200) of €167.2 per 100 kg, equivalent to 203 per cent.

Given the rise in agricultural prices, the reduction in tariffs, the growing importance of emerging economies and the concerns about domestic support, it is useful to analyse how ACP would be impacted under two possible scenarios. In 2008, it seemed that the Doha proposals on agriculture, as outlined in revision 4 of the Draft Modalities, would not have benefited ACP countries as a group. Most ACP countries would not have been obliged to make significant tariff reductions and hence would not have benefited from any improvement in resource reallocation. In addition, they would not benefit from any improvement in market access because of preference erosion. Many ACP countries enjoyed preferential access to developed country markets, and a general reduction in tariffs in these markets would make ACP countries worse off.

Here, we analyse two tariff-cutting approaches using the well-known GTAP model. The two scenarios are developed from the formula contained in revision 4 of the Draft Modalities from December 2008 and the

formula proposed in March 2015 (WTO, 2015b). Both scenarios are described in table 2.

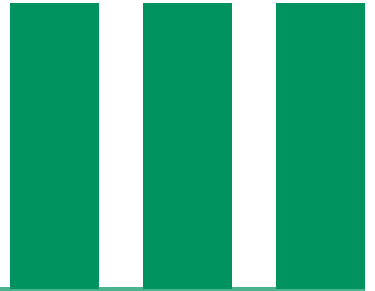
The formula proposed by Paraguay features an average cut for developed countries of 54 per cent with a minimum cut of 20 per cent for each tariff line (*Bridges Weekly*, 2015). In addition, up to 5 per cent of tariffs could be specified as sensitive products and attract a tariff cut of only 10 per cent. Developed and developing country groups would have different linear reductions consistent with special and differential treatment. Developing country tariffs would be reduced by 36 per cent, two thirds of the developed country rate, but the minimum would be 15 per cent. Developing countries could declare 12 per cent of their tariff lines as sensitive, for which the required tariff cut would be 10 per cent. Some developing country groups (SVEs and recently acceded members (RAMs)) would attract lower reductions of 24 per cent.

In addition to these modalities, Paraguay also suggests a “request-and-offer” approach, under which any bilaterally agreed tariff cuts would be made available to all members. Member countries would choose which products would enjoy the minimum tariff reductions.

This approach has the virtues of simplicity and flexibility, but the downside is a lack of harmonization and transparency. The Paraguay proposal does not specify how the average cut would be calculated, but based on the Uruguay Round experience it would be an unweighted average with no consideration given to the size of the initial tariff nor the associated trade flows. To obtain an average of 54 per cent, a country could reduce 42.5 per cent of its tariffs by 100 per cent and the remainder by 20 per cent. However, the 100 per cent reductions could be applied to tariffs of, for example, 5–10 per cent, and the minimum 20 per cent might be applied to all the higher tariffs. From a trade-weighted perspective, the average cut might be little more than 20 per cent, undermining considerably any significant reduction in tariffs. This is the case before considering the 5 per cent of products specified as sensitive.

Furthermore, tariff peaks may be untouched. Reducing high tariffs was considered desirable in 2008, so removing this feature might be considered a backward step.

Next we describe the standard GTAP model and the data.



MODELLING ALTERNATIVE SCENARIOS

A. THE STANDARD GTAP MODEL

The standard GTAP model used here is a static, multiregional, multisector, computable general equilibrium model (CGE) that assumes perfect competition and constant returns to scale (documented in Hertel, 1997). Bilateral trade is handled via the so-called Armington assumption that differentiates imports by source. Input–output tables reflect the links between sectors. GTAP is ideally suited for analysis of trade policies, such as the liberalization of industrial tariffs, which are likely to have international and intersectoral effects. The input–output tables capture the indirect intersectoral effects, while the bilateral trade flows capture the linkages between countries. A shock or policy change in any sector has effects throughout the whole economy. Tariff support for one sector, such as maize, tends to have negative effects on downstream sectors (livestock) by raising prices and costs. Changes in policies in sectors such as fuel tend to have relatively important economy-wide effects because many sectors use these inputs. Support in one market often has a negative effect on others because each sector competes with the others for factor inputs, capital, labour and land. CGE models attempt to capture these effects. The methodology involves specifying a data set that represents a specific year, postulating a change in tariffs or other policy variable, and comparing the simulated outcome with the base data. Impacts of the removal of trade barriers on trade flows, government revenues, welfare and resource allocation within countries can then be ascertained. It is important to note that no dynamic elements are assumed here, although in reality the policy changes are implemented over time and there are, in addition, time lags for their effects to be noticeable. There are also adjustment costs that are ignored. However, policy changes are phased in over a number of years and, in practice, the output changes would take place in a growing world economy. This facilitates the adjustment process.

1. The GTAP database

A pre-release of the GTAP version 9 database has been used for this analysis.⁷ The value (of output and trade flows) data relates to 2011 and the behavioural parameters, such as elasticities, are taken from the literature rather than econometrically estimated specifically for use within the model. Input–output

data are taken from national accounts and vary from year to year, depending on their availability in particular countries. The base tariff data, including preferential tariffs, are included in the database. The specified tariff line cuts for each country are fed into a software package – Tariff Analytical and Simulation Tool for Economists (TASTE).⁸ This programme has bilateral trade and tariff data for 236 countries and 5,052 products at the HS six-digit level. TASTE is used to calculate the shocks that are in turn fed into GTAP.

2. Aggregation

In a CGE framework it is not possible to analyse 5,052 individual products. The GTAP model has 57 sectors and these must be aggregated in turn to 20 or 30 sectors so that the model can function. In each country or region, the economy is divided into 27 sectors, including 11 agricultural sectors, 13 industrial sectors and three service sectors (appendix table A1).

The GTAP model has 140 regions but once again these need to be aggregated for the model to function. The 18 regions for this application are shown in appendix table A2. The selection reflects the ACP regional groups, West, Central, East and Southern Africa, the Pacific and the Caribbean. The members of the European Union are treated as one region.

B. THE SCENARIOS

The two scenarios described in table 2 differ in their treatment of tariff reductions, but include the same elimination of export subsidies and reductions in industrial tariffs. LDCs have no obligations to reduce tariffs, export subsidies or domestic support. With regards to NAMA, the Swiss formula with coefficients of 8 and 25 applies to developed and developing countries, respectively, with no exemptions and no sectoral elimination.

Scenario “revision-4 modalities” features a four-tier linear tariff reduction formula as shown in table 2. A lower tariff reduction is foreseen for 4 per cent of tariff lines with one third of the specified cuts applying to the selected tariffs lines. Members can choose their own sensitive products, so guessing what products are likely to be exempted for individual countries is a problem faced by negotiators and analysts. The approach here is to choose those products with the highest applied tariff revenue at the six-digit level. This is a combination of the tariff rate times the trade flow.⁹

Scenario “Paraguay formula” features linear average cuts without bands. The sensitive products are selected as for “revision 4” but a greater number is allowed and the treatment is more lenient. The cut is 10 per cent. Developed countries can select 5 per cent of their products as sensitive, whereas developing countries can nominate 12 per cent.

The scenarios do not include reductions in domestic support because most developed countries have managed to relabel their support to avoid reduction or are under their allowable limits. United States support for cotton, a contentious issue in 2008, has diminished with rising prices.

It makes negotiating sense to apply the minimum cuts to the highest tariffs and the highest cuts to the lowest tariffs, those that are 1 per cent or thereabouts. In

this application, for each country we sort all tariffs at the six-digit level according to applied tariff revenue in descending order.¹⁰ The highest tariffs attract the lowest cut, as indicated in table 3. For example, 5 per cent of the highest developed-country tariffs receive a 10 per cent cut.

As noted by Francois et al (2005) ten years ago, a cut in the average is not the same as an average cut, because the average does not take into account whether the cuts take place in high or low tariffs. The average cut may be little more than the minimum. Thus, tariff peaks and tariff escalation is not adequately addressed.

We ignore the request-and-offer approach outlined in the Paraguay proposal as this is too difficult to model.

Table 2. Scenario “revision-4 modalities” (Percentage)

Scenario	Developed countries	Developing countries	SVEs* and RAMs	LDC
Revision-4 modalities	If >75, -70 If >50 and ≤75, -63 If >20 and ≤50, -57 If ≤ 20, -50. Minimum average cut 54. Flexibility (sensitive products): One third of cuts foreseen in each tier on 4% of tariff lines. Eliminate export subsidies.	If >130, -47 If >80 and ≤130, -42 If >30 and ≤80, -38 If ≤ 30, -33. Maximum average cut 36. Flexibility (sensitive products): One third of cuts foreseen in each tier on 5.3% of tariff lines.	If >130, -37 If >80 and ≤130, -32 If >30 and ≤80, -28 If ≤ 30, -23. Maximum average cut 24. Flexibility: Zero cuts as necessary to reduce average to 24.	0
Paraguay formula	54 average cut with 20 minimum. Cap 100. Flexibility: 10% cuts on 5% of tariff lines	36 average cut with 15 minimum. Cap 100. Flexibility: 10% cuts on 12% of tariff lines	24 average cut. Cap 100	0

Source: Revision-4 modalities (WTO, 2008) and the Paraguay proposal (2015).

* SVEs and RAMs are listed in WTO (2008).

Table 3. Tariff-reduction strategy under the Paraguay formula (Percentage)

	Developed		Developing	
	Share of tariff lines	Cut	Share of tariff lines	Cut
Sensitive	5.0	10	12.0	10
Minimum	51.9	20	62.2	15
Maximum	43.1	100	25.4	100
Average		54		36

Source: Paraguay proposal (2015), as referenced under table 2.

C. THE RESULTS

1. Tariff changes

First we show the average tariff cuts for the ACP countries and then the trade and welfare impacts that result once the tariff cuts are simulated with GTAP. It turns out that both scenarios have little impact on ACP tariffs, but there is some difference on the tariffs they face. Given the existing trade flows, of most importance are the tariff reductions in the European Union, ACP's biggest market.

The reduction in the average applied tariff on ACP agricultural imports hardly moves at all under the revision-4 scenario, given the large gap between bound and applied rates for most ACP countries. The

Paraguay scenario is virtually no different (table 4). The old and new revision-4 tariffs are shown for each of 24 sectors in appendix table A3. For most sectors there is no change at all.

Of greater interest are the final tariffs facing ACP agricultural exporters. The revision-4 scenario improves the prospects of Southern Africa and the Caribbean in particular, but there is little improvement in market access for the other ACP groups (table 5). The Paraguay scenario produces similar tariff cuts.

One reason for the limited reduction in average tariffs facing ACP exporters is the increase in trade with other developing countries. Since these countries are not making substantial cuts in tariffs, the ACP countries benefit less than they might have in 2008.

Table 4. ACP average agricultural applied tariffs under alternative scenarios (Percentage)

Region	Base	Revision 4	Paraguay
Caribbean	11.0	10.9	9.8
Central Africa	13.5	13.2	13.3
East Africa	14.5	14.4	14.4
Pacific	11.9	11.8	11.1
Southern Africa	4.1	4.0	4.1
West Africa	11.7	11.6	11.6

Source: Calculations with TASTE.

Table 5. Average tariffs facing ACP agricultural exporters under alternative scenarios (Percentage)

Region	Base	Revision 4	Paraguay
Caribbean	14.3	13.4	12.8
Central Africa	5.6	5.5	5.5
East Africa	4.3	4.0	3.9
Pacific	1.7	1.6	1.6
Southern Africa	16.9	10.8	9.6
West Africa	2.4	2.4	2.4

Source: Calculations with TASTE.

Table 6. Average tariffs on agricultural exports to the European Union under alternative scenarios (Percentage)

Region	Base	Revision 4	Paraguay
Caribbean	7.59	5.97	6.38
Central Africa	0.23	0.17	0.16
East Africa	0.00	0.00	0.00
Pacific	1.14	0.94	0.87
Southern Africa	2.76	2.38	1.84
West Africa	0.10	0.09	0.09
Non-ACP	6.70	5.04	5.01

Source: Calculations with TASTE.

Almost one third of ACP exports are to the European Union (table 6). Hence, it is useful to examine European Union agricultural tariff reductions for ACP products. For many countries the tariffs are close to zero in the base period because of preferential access, and there is little scope for improvement.

The problem for ACP countries is that a reduction in MFN rates in developed countries assists those competitors of ACP that do not at the moment have preferential access. Furthermore, a reduction in domestic support in developed countries is likely to raise the world prices of temperate products that many ACP countries import. A general equilibrium model such as GTAP is useful to analyse these effects.

2. General equilibrium results

Member countries of ACP would be worse off if the policy changes simulated here were implemented. The effects are unevenly distributed and result from changes in agricultural tariffs, industrial tariffs and, to a lesser extent, export subsidies. In agriculture, the main impacts tend to be concentrated in only a few sectors, particularly sugar and dairy products. In the following text, the macroeconomic effects are discussed first, and then the sectoral ones.

3. Welfare impacts

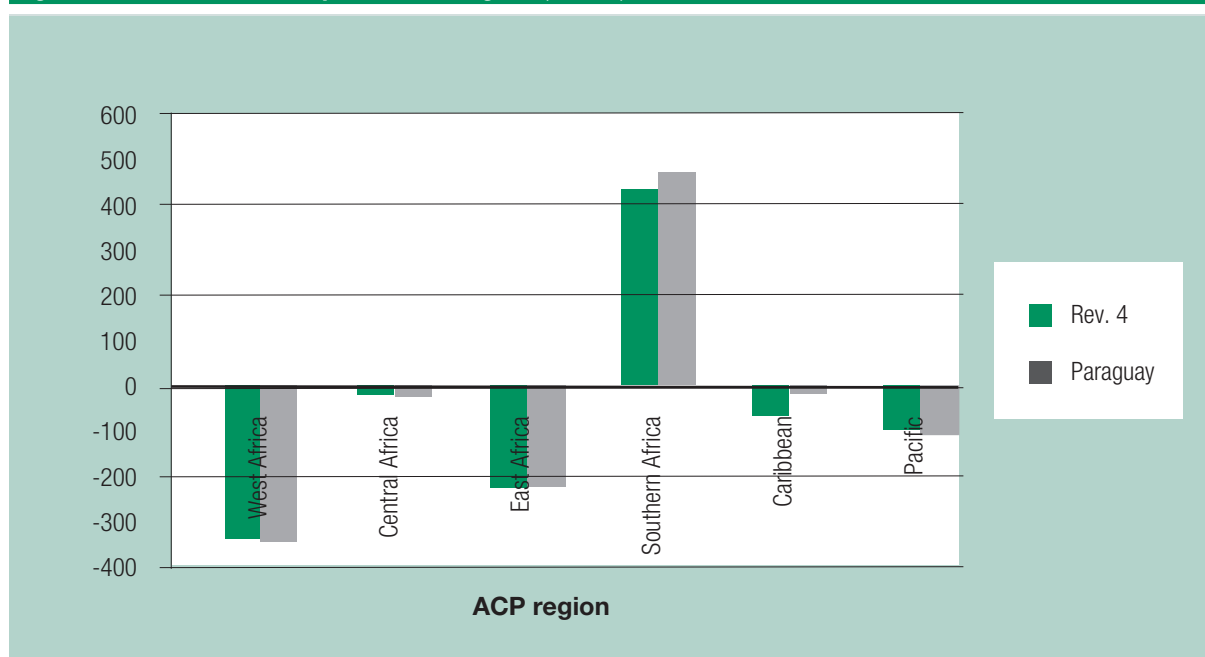
With the exception of Southern Africa, all ACP regions are estimated to experience a welfare loss if the scenarios are implemented as modelled here (figure 7).¹¹ These impacts include the responses to reductions in industrial tariffs as well as agriculture, but there are no reductions in barriers to services trade or non-tariff barriers, migration or investment flows. The pattern of gains and losses for ACP regions is much the same under each scenario, with the exception of the Caribbean, where welfare losses are reduced under the Paraguay scenario. Global welfare gains are similar – \$45 billion under the revision-4 scenario and \$47 billion under the Paraguay scenario.

There are several sources for welfare gains and losses:

- Allocative efficiency gains from using resources better;
- Changes in the quantity of endowments, such as land, labour, capital and natural resources;
- Changes in productivity;
- Terms of trade effects.

For ACP countries, there are little or no allocative efficiency gains from using resources better because most undertake no tariff liberalization that might lead

Figure 7. Estimated welfare impacts on ACP regions (Millions)



Source: GTAP simulation.

to an improvement in resource allocation. Changes in the quantity of endowments have been excluded by assumption¹² The welfare losses for ACP stem from negative terms-of-trade effects (table 7).

Terms-of-trade losses are in turn determined by a fall in export prices or a rise in import prices. With respect to agriculture, the main contributing factor for the East Africa and Pacific regions is a fall in export prices of sugar and other crops, reflecting increased competition in markets of developed countries from non-preferential exporters as MFN tariff rates are reduced. For West Africa, Central Africa and the Caribbean, the rise in import prices is the main contributor to adverse terms-of-trade effects. The main sectors are dairy products and a variety of processed food products. Appendix table A5 shows the terms-of-trade effects for each agricultural sector and for each ACP region.

The welfare effects can also be decomposed by sector and type of policy. The breakdown indicates that it is the industrial rather than the agricultural sector that generates the greatest welfare effects for ACP countries. While agriculture and NAMA must be negotiated simultaneously, it is instructive to see the

contribution of each to welfare gains and losses (table 8). It is the rise in the import price of motor vehicles that contributes most to the welfare losses, although East Africa is affected by falling export prices for crops and West Africa needs to pay more for dairy and processed food products.

The removal of export subsidies leads to a welfare loss in all ACP groups, mainly from the higher import prices of sugar and dairy products. Sugar exporters benefit from a marginally higher world price of sugar.

4. Trade impacts

Changes in trade for ACP groups are modest, less than 1 per cent in most cases, with the exception of Southern Africa. There is relatively little difference between the two scenarios (changes by sector for each region are shown in appendix tables A6 to A9). Global trade increases by around 1 per cent for agricultural and somewhat less for non-agricultural goods. Given that tariff reductions inevitably increase imports, and since global imports must equal global exports, it is reasonable to expect that multilateral tariff reductions would lead to an increase in national

Table 7. Welfare decomposition – Revision-4 scenario (millions of dollars)

Region	Allocative efficiency	Terms of trade	Welfare
Caribbean	72	-75	-47
Central Africa	1	-68	-22
East Africa	-67	-140	-257
Pacific	-4.95	-105	-104
Southern Africa	720	-318	434
West Africa	-99	-243	-363

Source: GTAP simulation.

Table 8. The contribution of agriculture and NAMA to welfare (millions of dollars)

Region	Revision 4	Agriculture tariff cuts only	NAMA only	Export subsidies only
Caribbean	-66	33	-76	-10
Central Africa	-18	-5	-12	-19
East Africa	-227	-80	-160	-13
Pacific	-101	-40	-61	-1
Southern Africa	436	159	282	-1
West Africa	-341	-155	-193	-71
ACP	-316	-87	-220	-114
World	45 119	22 539	23 193	18

Source: GTAP simulation.

exports in most countries, although this need not be the case. Indeed, the value of exports increases for Southern Africa, the Caribbean and the Pacific and decreases marginally in West Africa, East Africa and Central Africa. The changes are less than 0.5 per cent, with the exception of Southern Africa (2.1 per cent).

Agricultural exports are estimated to decrease marginally for West Africa, East Africa and the Pacific and increase marginally in Central Africa and the Caribbean (table 9). More striking are the gains for Southern Africa, where the increase is over 10 per cent.

5. Sectoral impacts

The agricultural exports of individual ACP countries tend to lack diversity and be relatively unprocessed. Three or four products may cover the bulk of the

exports. Prime examples include cotton, cocoa, coffee and cane sugar, although some countries seemed to have developed a speciality, such as cloves (Madagascar) or cut flowers (Kenya). The top five exports for all ACP WTO members are shown in appendix table A10. Almost all these products enter most developed countries duty-free, although tariffs may limit competition from low-cost suppliers.

The estimated changes in agricultural exports by sector are shown in absolute terms in table 10 for the revision-4 scenario. (Appendix table A6 shows the changes in relative (percentage) terms, but this can be misleading where there are large percentage changes from a low base, as in dairy exports in some regions.)

First we examine four major commodities and then look at how each of the six ACP regions might be affected by the revision-4 scenario.

Table 9. Changes in ACP merchandise exports (Percentage)

Region	Agriculture		NAMA only	
	Revision 4	Paraguay	Revision 4	Paraguay
Caribbean	2.63	4.18	-0.18	-0.28
Central Africa	0.99	1.24	-0.16	-0.22
East Africa	-0.75	-0.40	-0.75	-0.88
Pacific	-1.78	-2.01	0.69	0.78
Southern Africa	11.38	13.43	1.36	1.20
West Africa	-0.92	-0.94	-0.24	-0.25
World	1.06	1.09	0.72	0.70

Source: GTAP simulation.

Table 10. Changes in ACP agricultural exports by sector, revision-4 scenario (millions of dollars)

	Caribbean	Central Africa	East Africa	Pacific	Southern Africa	West Africa
Rice	0	0	4	0	1	17
Wheat	0	0	0	0	0	0
Vegetables, fruit and nuts	-8	0	-3	-2	28	-9
Sugar	38	0	-45	-5	1	0
Plant fibres	0	0	19	0	2	53
Other crops	-4	-1	20	-3	278	-89
Beef and veal	-2	1	-11	-1	799	-2
Pork and poultry	18	0	-6	-3	-3	-2
Dairy products	52	5	3	0	25	8
Food products n.e.c.	107	-1	-31	-17	33	-82
Beverages and tobacco	59	0	-6	0	0	0
Total	259	4	-58	-32	1165	-106

Source: GTAP simulation.

Sugar

Sugar is the major exported product for several ACP countries, including Cuba, Guyana, Mauritius, and Swaziland, and several more have it among their top five exports (see appendix table A10). The main suppliers to the European Union are Cuba, Jamaica, Mauritius, Swaziland and Zimbabwe, while there are 34 ACP countries in total that export sugar to the European Union. This trade developed under historical agreements that are being phased out and replaced with Economic Partnership Agreements. The European Union has pledged to remove sugar quotas by 2017 and generally reduce, or at least decouple, support. Meanwhile, the demand for sugar for biofuels has lifted prices. Sugar is highly protected at the borders of the European Union and also those of China, India and Japan, and it is regarded as a sensitive product, which limits the tariff cuts. In the revision-4 simulation, the European Union tariff of 54 per cent on imports from Latin America (including Brazil) is reduced to 43 per cent. The result is a switch in European Union imports from ACP countries, particularly from East Africa, to Latin America. In East Africa, the fall in exports to the European Union is 7 per cent; there is some switching to other destinations, so the decline in total sugar exports from this region is 4.9 per cent (appendix table A6). The decline in the sugar export price contributes \$10 million to the fall in welfare in East Africa, as shown in appendix table A5. This is significant for agriculture, although changes in industrial tariffs have a far greater effect.

One ACP region to gain from changes to sugar is the Caribbean. This is because Cuba currently faces a tariff of 64 per cent on sugar exports to the European Union. This is reduced in the simulation, allowing the Caribbean to increase sugar exports to the European Union by 20 per cent. After accounting for some trade diversion, exports to the world increase by 9 per cent (appendix table A6).

The European Union both imports and exports sugar. The imports are mainly raw cane sugar (HS 170111) while the exports are refined sugar (HS 170199). West Africa is one ACP region that is a net importer of sugar from the European Union.

Bananas

Several ACP countries have bananas as their major export; Cameroon, Côte d'Ivoire and the Dominican Republic are the major ACP exporters to the European

Union. There are no tariffs on these imports. The major competition is from Colombia, Costa Rica and Ecuador, which face an 8 per cent tariff. Bananas are selected as a sensitive product in the European Union and the reduction in tariffs on bananas is one third of the formula, that is, 16.7 per cent. In the model, bananas are aggregated into "other crops" and the effects are difficult to determine.

Cotton

Cotton is a major export for Benin, Burkina Faso, Burundi, Cameroon, the Central African Republic, Chad, Lesotho, Mali, the Niger, Togo, the United Republic of Tanzania, Zambia and Zimbabwe. There are no tariffs on these exports, nor on exports from non-ACP countries.¹³ Tariff changes will have no direct impact on cotton imports. In 2008 domestic support provided to United States cotton producers was a major sticking point in the Doha negotiations, but since then United States production has declined and prices have risen. United States support is likely to decline further under the 2014 Farm Bill, although the country remains the major exporter. However, changes to tariffs on textiles and apparel lead to an increase in demand for cotton in China and Association of Southeast Asian Nations (ASEAN) countries. There is an increase in exports from West Africa to Asia.

Dairy products

For ACP countries, dairy products make a significant contribution to rising food import bills. Dairy products are highly protected in many if not most developed and developing countries. The reduction in tariff protection leads to a decrease in production in the European Union (-2.2 per cent), Japan (-6.7 per cent) and "other developed countries" (-0.4 per cent). Global production falls marginally, pushing up world prices. The regions most affected are Central and West Africa (appendix table A5), where import prices rise 1.7 and 1.9 per cent respectively because these regions source a large share of their imports from the European Union. East Africa and the Pacific avoid this problem because they import mainly from New Zealand, the world's most competitive supplier. Likewise, the Caribbean imports from the United States, where tariffs and production have not been reduced.

West Africa

By far the largest agricultural exporters in West Africa are Côte d'Ivoire (cocoa, coffee, cashew nuts and

bananas) and Ghana (cocoa, cashew nuts, bananas and pineapple). These two countries are largely unaffected by tariff cuts. However, several Western African countries produce cotton, including Benin, Burkina Faso, Cameroon, Chad, Mali, and Togo. Simulations show an increase in cotton exports to China and ASEAN, as noted earlier, but a decrease in other crops and food products. The decrease in other crops is partly a substitution effect, to make way for increased cotton production, but also reflects a fall in demand from the European Union. As a result, total agricultural exports are reduced 1 per cent under this scenario. Countries in the region pay more for dairy and “food products”.

Central Africa

The Central Africa region is a small agricultural exporter and appears to be hardly affected in absolute terms. The Central African Republic and Chad produce cotton, the Congo coffee and Gabon tobacco. These countries pay more for imports of meat, dairy products and other processed foods.

East Africa

The major agricultural exporters in East Africa are Ethiopia (coffee and sesame seeds), Kenya (tea, cut flowers and coffee), Uganda (coffee) and the United Republic of Tanzania (tobacco and coffee). Mauritius, Mozambique, Zambia, Zimbabwe and several other countries export sizable amounts of sugar, even though this may not be their major export. East Africa is by far the largest ACP region exporting sugar to the European Union. This is the product most adversely affected in East Africa, for reasons described earlier.

There is also a fall in exports of “other crops” (tobacco) and “food products not elsewhere classified (n.e.c.)” (fish) to the European Union. However, there is a switch in “other crops” to ASEAN, China and “other developed countries”.¹⁴ There is also an increase in cotton sales to China and ASEAN. The major beneficiaries are the United Republic of Tanzania, Zambia and Zimbabwe.

Southern Africa

South Africa dominates exports in the Southern Africa region and its major agricultural exports are horticultural, including lemons, apples, pears, apricots, grapes and wine. It also exports fish, sugar

and beef, which, as for apples and pears, face a tariff in the European Union. South Africa gains when these tariffs are reduced. The four other countries in the region have preferential access and are exposed to preference erosion when tariffs are reduced. Namibia’s main exports to the European Union are fish, grapes and beef. Botswana exports beef and Swaziland’s main export is sugar. Lesotho exports small quantities of mandarins and maize flour.

South Africa gains from multilateral tariff reductions but the four other countries do not. The net result for the Southern Africa region is a gain because South Africa has a much larger economy than the other countries combined. From Southern Africa there is an increase in exports of non-cereal crops to Japan and the Republic of Korea and beef and veal to “other developed countries”. There is a modest decrease in sugar and beef exports to the European Union. However, these changes are most significant among all the ACP regions exporting beef and veal to the European Union.

The Caribbean

The Caribbean includes Cuba, which is a major sugar, tobacco and alcohol exporter, but it does not have preferential access into major markets. Hence, Cuba benefits from tariff cuts. Other major exports from the region are sugar (the Dominican Republic, Jamaica) and bananas (the Dominican Republic). The major increase in exports is “food products n.e.c.” to the Middle East and North Africa, but there is also an increase in sugar and “pork and poultry” exports to the European Union and dairy products to the United States and “other developed countries”. “Beverages and tobacco” exports to the European Union and the United States also increase.

Pacific

The major agricultural export from the Pacific region is crude palm oil, followed by fish and coffee. Palm oil is exported from Papua New Guinea to the European Union at zero tariffs. Fiji supplies a large quantity of sugar. Pacific countries suffer a reduction in agricultural exports under this scenario. The main change is a reduction in “food products n.e.c.” (fish) to Japan and the Republic of Korea. Sugar exports to the European Union are also reduced. Overall, agricultural exports are reduced, but in contrast to several other ACP regions the Pacific gains from

NAMA liberalization. This more than offsets the loss in agricultural exports.

On the import side, ACP countries undertake little or no tariff reductions so it is not surprising that the increase in imports is small, and in fact negative in several cases (). This reflects the increase in world prices of dairy and sugar as support for these products is reduced. Looking at sectoral impacts, the only changes of any significance are imports of dairy products and sugar (appendix table A8). The story here for ACP countries is a switch away from dairy imports from the European Union to “other developed countries” (Australia and

New Zealand). However, the net effect is a reduction in dairy imports of \$122 million, 3.3 per cent. For sugar there is a decrease in ACP imports of \$126 million, a large proportion from the European Union. However, imports from this source are only a fraction of ACP imports from Latin America.

Overall, there appears to be no large changes in agricultural import prices in any of the six regions. Prices neither fall dramatically from the removal of tariffs, nor rise as a result of rising world prices.

Table 11. Changes in ACP merchandise imports (Percentage)

Region	Agriculture		NAMA	
	Revision 4	Paraguay	Revision 4	Paraguay
Caribbean	0.55	1.47	0.48	0.49
Central Africa	-0.24	-0.38	0.12	0.04
East Africa	-0.62	-0.61	-0.41	-0.42
Pacific	-0.69	-0.35	0.20	0.19
Southern Africa	0.46	0.64	2.97	2.98
West Africa	-0.42	-0.44	-0.19	-0.20
World	1.30	1.35	0.76	0.75

Source: GTAP simulation.

IV

CONCLUSIONS

A. IMPLICATIONS FOR THE NEGOTIATIONS

As the Doha Round negotiations continue, what is the role of ACP countries? What is in their best interests? The first issue is whether they should continue to support the existing framework as outlined in revision 4 of the Revised Draft Modalities paper, referred to here as revision 4, or support a more flexible framework.

From the perspective of agriculture, an outcome resulting in a lesser reduction in tariffs would appear to be beneficial for most ACP countries because of the detrimental impacts of rising prices for imports of temperate products. However, the Paraguay formula generates quite similar levels of tariff reduction as revision 4, in spite of lacking the harmonizing aspects of the four-tier tariff reductions. Revision 4 has largely been negotiated, and the reasons for opening up the negotiations hinge on the notion of an upward trend in agricultural prices and the increasing importance of emerging developing countries such as Brazil, China and India. From the perspective of ACP countries, the Paraguay formula lacks transparency. Countries receiving ACP exports can choose whether a high tariff would be subject to the minimum 20 per cent cut or anything up to 100 per cent. Under revision 4, high tariffs would be subject to the greatest reductions, unless they were designated as sensitive.

Agriculture is important to ACP countries, but so is NAMA. Most of the impact depends on what other countries do rather than what reform is undertaken in ACP countries. We have not analysed the various alternatives within the NAMA negotiations, but as with agriculture, an outcome resulting in a lesser reduction in tariffs would tend to favour ACP countries.

The removal of export subsidies, part of the Draft Modalities, does not seem to benefit ACP countries, but the effects are relatively small given the small role that such subsidies have played in recent years. They could become more important if prices fall, but since many countries have moved towards decoupled payments, it seems unlikely that export subsidies will become as significant as they once were.

There has been little discussion here on domestic support. Most ACP countries are not constrained by domestic support commitments because they tend not to be able to afford subsidies up to the de minimis level, and in fact many of them tax rather than subsidize their agriculture. Furthermore, many support

payments can be for infrastructure or general services and exempt from reduction commitments. With respect to domestic support in developed countries, ACP countries are probably favoured by a flexible interpretation of the rules, as is the case at present, which allows generous support to be maintained. The current rules are somewhat ambiguous and allow members to provide support in ways that are ostensibly non-trade distorting. The recent United States Farm Bill suggests that the United States, as one of the largest providers of domestic support, is duly concerned about potential amber-box reduction commitments. In addition to this, with the focus now on the interim solution to the Government procurement of stocks for food security, it seems unlikely that members will agree to rein in trade distorting domestic support until after 2017.

In spite of the apparent welfare losses from our modelling results, a quick solution to the Doha Round is probably in the best interest of ACP countries. The alternative to a successful Doha Round is a succession of regional trade arrangements that tend to undermine the position of ACP countries. Examples are the Transatlantic Trade and Investment Partnership, the Trans-Pacific Partnership and the Regional Comprehensive Economic Partnership. Temporary gains may be made when joining these agreements, but such gains are lost when other members form additional arrangements with competitors. Multilateral liberalization is to be preferred.

One alternative is unilateral liberalization. Many countries have taken this path. The objection to this approach is a loss of negotiating capital, but it is debatable whether this is of much value to many ACP countries with small markets.

The limitations of the analysis should be noted. Apart from the usual data issues and absence of dynamic gains (the modelling ignores some of the benefits of dynamic gains through investment, competition and technology), there are concerns about whether the implementation would occur as envisaged in the scenarios. We have had to guess which tariffs would be regarded as sensitive, or attract the minimum cuts in the case of the Paraguay formula. Liberalization exposes an incentive to raise non-tariff barriers, such as sanitary and phytosanitary barriers on agricultural imports. A rise in spurious anti-dumping measures might also be expected. For these reasons, the impacts of liberalization may be overstated.

On the other hand, we have ignored the request-and-offer approach suggested by Paraguay in addition to the formula approach. This is likely to lead to some additional liberalization, although trying to predict what the impact might be seems difficult.

Not analysed here is the relationship in the negotiations between agriculture and NAMA. An outcome resulting in a significant lowering of tariffs for agriculture would most likely require a similar outcome for industrial tariffs. Analysis of the options available for NAMA is beyond the scope of this paper.

On the other hand, some of the policy changes simulated may occur in the absence of a Doha Round outcome. The European Union has plans to reduce its sugar support, and is negotiating several regional and bilateral preferential trading arrangements with other (non-ACP) trading partners.

Also not included here are the costs of structural adjustment, of moving resources from one sector to another. Temporary unemployment of labour is

usually a feature of such adjustment. This is difficult to calculate, especially in developing countries, but is tangible nonetheless.

Finally, in this analysis we have focused on the welfare impacts for groups of countries. The 79 countries are aggregated into six groups. Of course, members of each group could be affected in different ways, depending on whether they are net importers or exporters of temperate products or their tropical substitutes. So the general conclusions may not hold for all members. They may well have conflicting interests.

The focus on national welfare implies that producers and consumers are equally important and that agricultural producers are no more important than industrial producers or service providers. Negotiators may have a different perspective and give more attention to specific groups, such as exporters, or poor producers, or those in a contracting sector such as sugar. No account is taken of these perspectives here.

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ENDNOTES

- ¹ Members of the G-33 include: Antigua and Barbuda, Barbados, the Plurinational State of Bolivia, Belize, Benin, Botswana, China, the Congo, Côte d'Ivoire, Cuba, the Dominican Republic, El Salvador, Guatemala, Grenada, Guyana, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Madagascar, Mauritius, Mongolia, Mozambique, Nicaragua, Nigeria, Pakistan, Panama, Peru, the Philippines, the Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Senegal, Sri Lanka, Suriname, Trinidad and Tobago, Turkey, Uganda, the United Republic of Tanzania, the Bolivarian Republic of Venezuela, Zambia and Zimbabwe. The ACP, African, least developed countries (LDCs) and small, vulnerable economies (SVEs) groups are supportive of this instrument.
 - ² Bridges Weekly (2014).
 - ³ The key documents in the negotiations are the Doha Ministerial Declaration (WT/MIN(01)/DEC/1), the Framework Agreement of 1 August 2004 (WT/L/579), sometimes called the July Framework, the Hong Kong Ministerial Declaration of 18 December 2005 (WT/MIN(05)DEC) and the Revised Draft Modalities for Agriculture of 1 August 2007 (TN/AG/W/4 and Corr.1).
 - ⁴ WT/MIN(15)/DEC, as well as WT/MIN(15)/40-48.
 - ⁵ Beet and cane sugar are substitutes in consumption, but not production. The United States also produces high-fructose corn syrup from maize.
 - ⁶ See also <http://www.tralac.org/discussions/article/5684-the-end-of-the-eu-sugar-quota-and-the-implication-for-african-producers.html>.
 - ⁷ Documentation for version 8 can be found in Narayanan et al. (2012).
 - ⁸ See Horridge and Laborde (2008) for documentation.
 - ⁹ A limitation here is prohibitive tariffs. If the trade flow is zero or low, this measure does not capture these tariff lines.
 - ¹⁰ Members may make cuts at the tariff-line level rather than at six digits, as modelled here. To test if there is a significant difference, we applied the tariff-cutting methodology to European Union tariffs at 10 digits. At this level, the initial average tariff is much higher but the average cut is similar. Tariffs cannot be trade weighted at this level because of the absence of matching trade data.
 - ¹¹ Welfare effects for non-ACP countries are shown in appendix table A4.
 - ¹² This is an important assumption because it implies there is no surplus or underemployed labour that can be better used, nor is there any additional unemployment.
 - ¹³ Cotton is aggregated into "plant fibres" in the GTAP simulations. This sector is mainly cotton.
 - ¹⁴ "Other developed countries" includes Australia, Canada, New Zealand, Norway, Switzerland and other European Free Trade Association (EFTA) countries.
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APPENDIX

Table A1. Sector aggregation according to GTAP model: Sectors

RCE	Rice
WHT	Wheat
VFN	Vegetables, fruit and nuts
SUG	Sugar
PFB	Plant fibres
CRPS	Other crops
FF	Forestry and fishing
RES	Resources
BV	Beef and veal
PP	Pork and poultry
DRY	Dairy products
OFD	Food products n.e.c.
B_T	Beverages and tobacco
TXT	Textiles
WAP	Wearing apparel
LEA	Leather
ELE	Electronics
P_C	Petroleum, coal products
MVT	Motor vehicle and trans equip
WPP	Wood and paper products
CRP	Chemical, rubber and plastics
OME	Machinery and equipment n.e.c.
NMM	Mineral products n.e.c.
MAN	Manufactures
TSP	Transport and communications
BSV	Business services
SVC	Other services

Source: GTAP database.

West Africa includes the countries/territories Benin, Burkina Faso, Cameroon, Cabo Verde, Cote d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, the Niger, Sierra Leone, Togo and Saint Helena.

Central Africa includes the countries Central African Republic, Chad, the Congo, Equatorial Guinea, Gabon and Sao Tome and Principe.

East Africa includes the countries/territories Burundi, the Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, the Sudan, Uganda, the United Republic of Tanzania, Zambia, Zimbabwe, Mayotte and Réunion.

Southern Africa includes the countries Botswana, Lesotho, Namibia, South Africa and Swaziland.

Table A2. Sector aggregation according to GTAP model: Regions

EU_27	European Union 27
USA	United States of America
JPN	Japan
KOR	Republic of Korea
ODV	Other developed
CHINA	China and Hong Kong (China)
IND	India
ASEAN	Asia
XAS	Other Asia
LAM	Latin America
MENA	Middle East and North Africa
WA	West Africa
CA	Central Africa
EA	East Africa
SA	Southern Africa
CRB	Caribbean
PAC	Pacific
RoW	Rest of world

Source: GTAP database.

Caribbean includes the countries/territories Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, the Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Aruba, Anguilla, the Cayman Islands, Guadeloupe, Martinique, Monserrat, the Netherlands Antilles, Puerto Rico, the Turks and Caicos Islands, the British Virgin Islands and the United States Virgin Islands.

Pacific includes the countries/territories Fiji, Kiribati, the Marshall Islands, the Federal States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu, Vanuatu, American Samoa, the Cook Islands, French Polynesia, Guam, New Caledonia, Niue, Norfolk Island, the Northern Mariana Islands, Tokelau and Wallis and Futuna.

Table A3. ACP tariffs, old and new by sector, revision-4 scenario (Percentage)

	West Africa		Central Africa		East Africa	
	Old	New	Old	New	Old	New
Rice	10.0	10.0	6.4	6.4	14.7	14.7
Wheat	5.0	5.0	8.0	8.0	5.8	5.8
Vegetables, fruit and nuts	16.0	15.6	14.1	13.6	11.1	11.1
Sugar	10.8	10.7	13.5	13.1	30.9	29.9
Plant fibres	6.1	6.1	5.2	5.2	0.3	0.3
Other crops	11.0	11.0	14.3	13.9	14.8	14.8
Forestry and fishing	6.2	6.2	15.1	14.8	4.5	4.3
Resources	3.5	3.5	10.3	10.3	1.8	1.8
Beef and veal	10.9	10.6	12.6	12.6	5.1	5.1
Pork and poultry	17.1	16.9	10.5	10.5	11.2	11.2
Dairy products	7.8	7.8	6.8	6.6	16.5	16.5
Food products n.e.c.	14.8	14.7	13.0	12.7	14.2	14.1
Beverages and tobacco	17.4	17.2	24.8	24.6	18.8	18.8
Textiles	16.7	16.6	14.5	14.2	18.5	18.5
Wearing apparel	18.6	18.4	18.0	17.5	31.2	31.2
Leather	12.5	12.4	16.0	15.6	25.0	25.0
Electronics	7.1	7.1	8.5	8.3	5.4	5.4
Petroleum, coal products	8.4	8.4	13.8	13.7	5.6	5.6
Motor vehicle and trans equip	12.2	12.1	7.0	6.3	10.0	10.0
Wood and paper products	7.5	7.5	14.4	14.0	12.7	12.7
Chemical, rubber and plastics	8.6	8.6	9.9	9.7	6.3	6.3
Machinery and equipment n.e.c.	6.8	6.7	6.1	5.8	6.3	6.3
Mineral products n.e.c.	14.3	14.3	17.5	17.2	12.6	12.6
Manufactures	13.9	13.9	10.3	9.9	11.2	11.2
Total	10.1	10.1	9.9	9.6	9.6	9.6

Source: GTAP database and author's calculations.

Table A3. ACP tariffs, old and new by sector, revision-4 scenario (Percentage) (continued)

	West Africa		Central Africa		East Africa	
	Old	New	Old	New	Old	New
Rice	0.0	0.0	7.4	7.4	1.7	1.7
Wheat	0.0	0.0	0.1	0.1	0.2	0.2
Vegetables, fruit and nuts	3.7	3.6	13.5	12.6	11.3	10.5
Sugar	0.0	0.0	15.8	15.8	27.1	27.1
Plant fibres	1.9	1.9	4.4	4.4	12.5	12.5
Other crops	6.4	6.1	6.1	5.9	9.0	9.0
Forestry and fishing	2.9	2.9	10.1	9.0	5.4	5.2
Resources	0.0	0.0	0.5	0.5	0.1	0.1
Beef and veal	10.1	10.1	9.9	9.9	4.9	4.8
Pork and poultry	6.7	6.7	15.5	14.9	12.1	11.9
Dairy products	8.1	8.1	13.4	12.9	9.8	9.8
Food products n.e.c.	4.2	4.0	10.8	9.9	14.9	14.3
Beverages and tobacco	2.1	2.1	23.1	21.9	35.0	34.5
Textiles	16.6	9.5	5.5	5.1	8.3	7.2
Wearing apparel	31.7	12.2	16.6	14.3	23.2	14.9
Leather	23.2	11.4	12.7	11.3	14.1	11.9
Electronics	0.5	0.5	5.9	5.3	4.2	3.9
Petroleum, coal products	2.2	2.2	3.3	3.3	129.9	129.9
Motor vehicle and trans equip	10.2	8.4	11.0	9.4	1.9	1.8
Wood and paper products	4.4	3.0	9.2	8.8	10.3	9.2
Chemical, rubber and plastics	2.4	1.8	7.5	7.2	5.8	5.7
Machinery and equipment n.e.c.	1.8	1.6	6.9	6.2	1.7	1.6
Mineral products n.e.c.	3.9	2.8	10.6	9.6	6.9	6.5
Manufactures	2.6	2.1	8.6	7.8	7.5	5.8
Total	4.2	3.1	7.1	6.6	24.8	24.4

Source: GTAP database and author's calculations.

Table A4. Welfare impacts (millions of dollars)		
Region	Revision 4	Paraguay
European Union 27	4 793	4 044
United States	-1 187	-995
Japan	9 063	10 055
Republic of Korea	9 758	10 767
Other developed	5 465	5,303
China and Hong Kong (China)	16 092	17 252
India	885	950
Asia	1 747	1 351
Other Asia	1 273	901
Latin America	15	124
Middle East and North Africa	-1 324	-1 281
West Africa	-341	-349
Central Africa	-18	-26
East Africa	-227	-225
Southern Africa	436	467
Caribbean	-66	-19
Pacific	-101	-109
Rest of World	-1 145	-1 018
World	46 091	47 192

Source: GTAP simulation.

Table A5. ACP regions change in terms of trade from the revision-4 scenario (millions of dollars)

West Africa	World price	Export price	Import price
Rice	-11.35	-0.19	-3.4
Wheat	2.48	0	-4.1
Vegetables, fruit and nuts	1.76	-7.11	0.29
Sugar	-11.68	-0.35	-4.55
Plant fibres	1.84	-3.34	0.06
Other crops	-4.19	-9.87	1.11
Beef and veal	0.25	-0.01	-2.12
Pork and poultry	0.12	-0.1	-0.15
Dairy products	-9.1	-0.57	-13.42
Food products n.e.c.	11.93	13.3	-18.81
Beverages and tobacco	1.54	0.19	-3.85
Agriculture	-16.4	-8.05	-48.94
Central Africa	World price	Export price	Import price
Rice	-1.23	0	-0.36
Wheat	0.14	0	0.27
Vegetables, fruit and nuts	-0.17	-0.02	-0.28
Sugar	-3.58	-0.08	0.71
Plant fibres	0.07	-0.15	0.01
Other crops	0.71	-0.06	-0.2
Beef and veal	0.68	0	-1.04
Pork and poultry	0.28	-0.01	-5.98
Dairy products	-3.59	-0.1	-7.48
Food products n.e.c.	10.08	0.17	-9.29
Beverages and tobacco	2.47	0.03	-5.77
Agriculture	5.86	-0.22	-29.41
East Africa	World price	Export price	Import price
Rice	-1.79	-0.48	-0.08
Wheat	1.25	-0.03	-0.45
Vegetables, fruit and nuts	0.64	-4.89	0.84
Sugar	-0.54	-10.26	4.52
Plant fibres	0.67	-1.89	0.11
Other crops	-4.41	-14	-0.95
Beef and veal	-0.98	-1.08	0.09
Pork and poultry	-0.02	-0.83	0.18
Dairy products	-2.25	-1.07	0.33
Food products n.e.c.	-0.53	2.4	-5.62
Beverages and tobacco	0.12	-0.3	-0.2
Agriculture	-7.84	-32.43	-1.23

Table A5. ACP regions change in terms of trade from the revision-4 scenario (millions of dollars) (continued)

Southern Africa	World price	Export price	Import price
Rice	-1.75	-0.08	-0.53
Wheat	0.44	0	-0.51
Vegetables, fruit and nuts	1.95	2.39	-0.6
Sugar	2.16	-4.08	1.16
Plant fibres	-0.06	-0.14	0.29
Other crops	0.49	3.56	0.26
Beef and veal	-0.94	2.04	0.15
Pork and poultry	0.06	-0.45	-1.35
Dairy products	-0.35	-1.65	-3.32
Food products n.e.c.	-3.36	4.7	-1.08
Beverages and tobacco	-1.44	-0.39	-0.09
Agriculture	-2.8	5.9	-5.62
Caribbean	World price	Export price	Import price
Rice	-1.03	-0.11	0.32
Wheat	0.32	0.02	-0.16
Vegetables, fruit and nuts	0.18	-1.06	-0.28
Sugar	3.48	-5.54	0.8
Plant fibres	0	-0.01	0
Other crops	0.8	0.19	-2.99
Beef and veal	0.32	0.01	0.19
Pork and poultry	0.1	-0.08	0.71
Dairy products	-3.25	-1.89	-0.28
Food products n.e.c.	-9.78	11.83	-4.71
Beverages and tobacco	-1.03	0.55	-0.24
Agriculture	-9.89	3.91	-6.64
Pacific	World price	Export price	Import price
Rice	-0.52	-0.01	0.16
Wheat	0.07	-0.01	0.02
Vegetables, fruit and nuts	-0.02	-0.38	0.16
Sugar	0.45	-1.11	0.21
Plant fibres	0	-0.01	0
Other crops	-1.19	-7.82	0.13
Beef and veal	0.22	-0.05	0.81
Pork and poultry	0.03	-0.15	1.11
Dairy products	-1.02	-0.17	-0.61
Food products n.e.c.	-2.49	0.25	0.54
Beverages and tobacco	0.03	-0.24	-0.06
Agriculture	-4.44	-9.7	2.47

Source: GTAP simulation.

Table A6. ACP change in exports from the revision-4 scenario (Percentage)

	WA	CA	EA	SA	CRB	PAC
Rice	1.01	2.19	-0.36	0.63	-0.23	-2.07
Wheat	-0.23	0.39	0.17	-0.7	-1.2	2.11
Vegetables, fruit and nuts	-0.78	-0.81	-0.66	1.13	-1.55	-4.03
Sugar	-0.57	1.51	-4.83	-0.08	9.29	-5.74
Plant fibres	2.84	0.01	2.16	2.94	-0.14	2.35
Other crops	-1.49	-1.31	-0.48	20.23	-0.91	-0.68
Forestry and fishing	0.18	-0.16	0.45	2.89	-0.2	0.36
Resources	-0.15	-0.14	-0.12	-0.01	-0.03	-0.27
Beef and veal	-6.98	20.91	-1.65	132.6	-8.01	-6.71
Pork and poultry	-4.82	-1.99	-2.64	-0.31	13.37	-12.75
Dairy products	8.68	43.95	1.9	15.31	23.81	-2.51
Food products n.e.c.	-2.17	-2.47	-1.87	1.09	1.93	-2.89
Beverages and tobacco	-0.17	-0.74	-1.66	-0.25	3.25	-0.83
Textiles	-0.95	-1.46	-8.17	-4.42	-11.03	-6.2
Wearing apparel	-9.08	-5.54	-18.14	-14.82	-15.2	-13.69
Leather	-9.52	-13.56	-7.02	-11.61	85.7	-12.68
Electronics	1.46	1.41	2.15	1.58	1.73	3.88
Petroleum, coal products	-0.21	-0.14	-0.12	0.08	-0.15	0.52
Motor vehicle and trans equip	-1.8	-2.64	-1.61	8.69	-0.51	-3.29
Wood and paper products	0.45	0.75	0.39	0.93	-0.21	1.34
Chemical, rubber and plastics	-0.13	-0.4	0.19	0.91	-1.25	0.44
Machinery and equipment n.e.c.	0.42	0.33	0.66	1.39	0.63	2.49
Mineral products n.e.c.	0.23	0.08	-0.13	0.01	-2.22	0.19
Manufactures	-0.03	-0.24	0.41	1.13	-0.22	2.2
Transport and communications	0.61	0.7	0.76	0.67	0.43	0.7
Business services	0.37	0.34	0.76	0.56	0.21	0.71
Other services	0.23	0.29	0.54	0.8	0.31	0.69
Total	-0.31	-0.18	-0.54	2.1	0.4	0.33

Source: GTAP simulation.

Note: Total includes services trade.

Table A7. ACP change in exports from the Paraguay scenario (Percentage)

	WA	CA	EA	SA	CRB	PAC
Rice	93.16	3.25	5.42	1.21	1.79	-1.19
Wheat	-0.03	-0.07	0.19	-1.18	-1.83	2.71
Vegetables, fruit and nuts	-0.28	-0.63	-0.62	1.07	-1.12	-4.29
Sugar	0.92	1.9	-1.34	0.93	11.18	-2.21
Plant fibres	2.79	-0.03	1.99	2.69	-0.22	2.57
Other crops	-1.45	-1.21	0.47	30.19	-1.15	-0.67
Forestry and fishing	0.18	-0.19	0.44	2.96	-0.28	0.41
Resources	-0.16	-0.14	-0.14	-0.05	-0.04	-0.27
Beef and veal	-4.04	10.39	-3.54	147.03	-5.31	-5.27
Pork and poultry	-4.41	-2.74	-3.74	-0.75	42.86	-10.68
Dairy products	8.41	77.72	1.79	13.46	31.08	-2.65
Food products n.e.c.	-2.39	-2.48	-2.07	0.09	2.72	-3.45
Beverages and tobacco	-0.11	-1.2	-1.77	-0.92	3.86	-0.92
Textiles	-1.11	-1.58	-8.4	-4.53	-11.21	-6.19
Wearing apparel	-9.18	-5.64	-18.37	-15.03	-15.36	-13.66
Leather	-9.65	-13.68	-7.35	-11.87	85.4	-12.64
Electronics	1.42	1.39	1.88	1.39	1.61	3.98
Petroleum, coal products	-0.22	-0.15	-0.15	0.06	-0.16	0.55
Motor vehicle and trans equip	-1.8	-2.62	-1.73	8.61	-0.57	-3.3
Wood and paper products	0.41	0.71	0.22	0.8	-0.31	1.38
Chemical, rubber and plastics	-0.18	-0.43	0.08	0.77	-1.34	0.5
Machinery and equipment n.e.c.	0.39	0.31	0.44	1.25	0.52	2.6
Mineral products n.e.c.	0.22	0.06	-0.21	-0.07	-2.27	0.19
Manufactures	-0.07	-0.25	0.22	0.98	-0.29	2.31
Transport and communications	0.6	0.7	0.7	0.61	0.39	0.72
Business services	0.33	0.32	0.64	0.47	0.17	0.77
Other services	0.2	0.28	0.43	0.72	0.27	0.74
Total	-0.29	-0.18	-0.49	2.16	0.54	0.36

Source: GTAP simulation.

Table A8. ACP change in imports from the revision-4 scenario (Percentage)

	WA	CA	EA	SA	CRB	PAC
Rice	-1.14	0.12	-1.17	0.38	-0.46	-0.25
Wheat	-0.16	-0.3	-0.65	0.19	0.3	-1.1
Vegetables, fruit and nuts	-0.17	0.24	-0.67	2.74	1.01	-0.22
Sugar	-0.2	0.07	0.29	-0.5	-0.3	-1.04
Plant fibres	-0.19	-0.2	-1.9	-1.24	0.01	0.67
Other crops	-0.46	0.24	-0.89	1.23	0.22	0.3
Forestry and fishing	-0.4	0.3	-0.46	0.11	1.72	0.13
Resources	-0.16	-0.18	0.04	-0.01	-0.18	0.36
Beef and veal	-1.44	-0.42	-0.81	5.35	0.15	-0.45
Pork and poultry	-0.45	-0.38	-0.84	-0.55	1.24	-0.87
Dairy products	-1.34	-4.74	-2.53	-5.91	0.05	-3.31
Food products n.e.c.	-0.3	0.02	-0.56	0.49	1.15	-0.12
Beverages and tobacco	-0.21	-0.08	-0.48	-0.24	1.56	0.38
Textiles	-0.11	0.14	-1.43	12.86	-0.18	-0.82
Wearing apparel	-0.42	1.51	-1.16	65.09	6.11	7.73
Leather	-0.59	0.12	-1.35	27.64	3.87	0.57
Electronics	-0.24	-0.03	-0.62	-0.27	0.69	-0.47
Petroleum, coal products	-0.15	-0.21	-0.1	-0.04	-0.16	-0.23
Motor vehicle and trans equip	-0.13	0.04	-0.3	2.55	0.92	0
Wood and paper products	-0.41	0.27	-0.6	3.52	0.5	1.16
Chemical, rubber and plastics	-0.23	-0.06	-0.41	0.55	0.2	-0.43
Machinery and equipment n.e.c.	-0.24	-0.07	-0.47	0.03	0.51	-0.34
Mineral products n.e.c.	-0.2	0.05	-0.61	2.46	1.26	-0.13
Manufactures	-0.27	0.22	-0.41	1.11	0.86	2.42
Transport and communications	-0.35	-0.49	-0.6	-0.58	-0.37	-0.5
Business services	-0.43	-0.32	-0.7	-0.61	-0.27	-0.63
Other services	-0.42	-0.41	-0.64	-0.43	-0.35	0
Total	-0.29	-0.14	-0.52	2.37	0.4	0.03

Source: GTAP simulation.

Table A9. ACP change in imports from the Paraguay scenario (Percentage)

	WA	CA	EA	SA	CRB	PAC
Rice	-0.99	0.08	-0.98	0.35	-0.36	-0.42
Wheat	-0.15	-0.28	-0.56	0.22	0.48	-1.3
Vegetables, fruit and nuts	-0.23	-0.16	-0.54	3.03	2.05	0.28
Sugar	-0.21	0.05	0.06	-0.41	-0.18	-0.42
Plant fibres	-0.22	-0.18	-1.92	-1.16	1.15	0.86
Other crops	-0.4	0.28	-0.71	1.65	0.59	0.56
Forestry and fishing	-0.38	0.37	-0.38	0.18	2.18	0.13
Resources	-0.17	-0.19	-0.04	-0.01	-0.19	0.37
Beef and veal	-1.65	-0.45	-0.65	6.12	0.55	-0.49
Pork and poultry	-0.29	-0.41	-0.64	-0.51	2.63	-0.79
Dairy products	-1.37	-5.21	-2.39	-5.84	1.29	-3.33
Food products n.e.c.	-0.3	-0.08	-0.49	0.42	2.01	0.09
Beverages and tobacco	-0.15	-0.15	-0.42	-0.23	2.77	1.14
Textiles	-0.11	0.17	-1.38	12.96	-0.17	-0.84
Wearing apparel	-0.37	1.54	-1.04	65.26	6.17	7.69
Leather	-0.58	0.14	-1.24	27.77	3.91	0.54
Electronics	-0.24	-0.03	-0.55	-0.23	0.73	-0.51
Petroleum, coal products	-0.16	-0.21	-0.12	-0.02	-0.16	-0.24
Motor vehicle and trans equip	-0.12	0.04	-0.28	2.58	0.95	0.02
Wood and paper products	-0.4	0.28	-0.53	3.57	0.54	1.11
Chemical, rubber and plastics	-0.23	-0.06	-0.36	0.61	0.22	-0.46
Machinery and equipment n.e.c.	-0.24	-0.07	-0.43	0.08	0.53	-0.36
Mineral products n.e.c.	-0.2	0.06	-0.56	2.52	1.28	-0.21
Manufactures	-0.26	0.23	-0.39	1.13	0.87	2.43
Transport and communications	-0.34	-0.48	-0.55	-0.53	-0.34	-0.52
Business services	-0.42	-0.32	-0.63	-0.55	-0.25	-0.68
Other services	-0.4	-0.42	-0.58	-0.39	-0.33	-0.05
Total	-0.28	-0.14	-0.47	2.42	0.52	0.04

Source: GTAP simulation.

Table A10. Major agricultural exports for ACP WTO members

Country	HS code	GTAP code	\$ millions
Angola			
Crustaceans, live, fresh etc., and cooked etc.	0306p	OFD	1 418
Flour, meal etc. of meat etc., not for human: greavs	2301p	OFD	665
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	302
Fats and oils, their fractions, fish and marine mammal	1504	OMT	221
Wheat	1001	WHT	197
Antigua and Barbuda			
Cocoa beans,	1801	OCR	11 194
Margarine, edible mixtures etc.	1517	VOL	7 120
Fish, frozen	0303	OFD	2 847
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	1 629
Barbados			
Milk and cream, concentrated or sweetened	0402	MIL	9 048
Cocoa beans,	1801	OCR	6 370
Ethyl alcohol, undenat., und. 80% alc., spirit bev. etc.	2208	B_T	4 789
Malt ext., food prep. of flour etc. un. 50% cocoa etc.	1901	OFD	2 444
Ethyl alcohol, undenat., n/un. 80% alc., alcohol, denat.	2207	B_T	2 361
Belize			
Wheat	1001	WHT	14 312
Bananas	0803	V_F	7 071
Cane or beet sugar	1701	SGR	6 896
Fruit juices (and grape must) and veg. juice, no spirit	2009	OFD	6 196
Fish, frozen	0303	OFD	3 820
Benin			
Cotton, not carded or combed	5201	PFB	22 296
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	16 241
Cane or beet sugar	1701	SGR	2 294
Oil seeds and oleaginous fruits	1207	OSD	990
Palm oil and its fractions	1511	VOL	910
Botswana			
Meat of bovine animals, fresh or chilled	0201	CMT	4 779
Meat of bovine animals, frozen	0202	CMT	2 388
Live bovine animals	0102	CTL	1 181
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	861
Cereal grouts	1103	OFD	753
Dates, figs, pineapples, avocados	0804	V_F	1 066
Leguminous vegetables, dried shelled	0713	V_F	524
Burundi			
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	7 828
Tea	0902p	OCR	1 211
Beer made from malt	2203	B_T	195
Cotton, not carded or combed	5201	PFB	186
Coffee, coffee husks etc., substitutes with coffee	0901p	OFD	130

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Cabo Verde			
Fish, frozen	0303	OFD	2 714
Prep. or pres. fish, caviar and caviar substitutes	1604	OFD	2 572
Rice	1006p	PCR	298
Ethyl alcohol, undenat., und. 80% alc., spirit bev. etc.	2208	B_T	88
Milk and cream, concentrated or sweetened	0402	MIL	58
Cameroon			
Cocoa beans,	1801	OCR	58 418
Bananas	0803	V_F	27 507
Cotton, not carded or combed	5201	PFB	20 028
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	9 806
Cocoa paste	1803	OFD	6 197
Central African Republic			
Cotton, not carded or combed	5201	PFB	1 911
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	375
Coffee, coffee husks etc., substitutes with coffee	0901p	OFD	183
Vegetable waxes n.e.s.o.i.	1521p	OAP	166
Leguminous vegetables	0708	V_F	43
Chad			
Cotton, not carded or combed	5201	PFB	6 850
Oil seeds and oleaginous fruits	1207	OSD	1 053
Milk and cream, concentrated or sweetened	0402	MIL	102
Other live animals	0106	OAP	75
Live sheep	0104	CTL	43
Congo			
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	1 632
Bran, sharps etc.	2302	OFD	1 340
Cane or beet sugar	1701	SGR	908
Cocoa beans,	1801	OCR	717
Plants etc. for pharmacy, perfume, insecticides	1211	OCR	663
Côte d'Ivoire			
Cocoa beans	1801	OCR	333 249
Cocoa paste	1803	OFD	96 853
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	36 980
Cocoa butter, fat and oil	1804	OFD	34 501
Palm oil and its fractions	1511	VOL	26 507
Cuba			
Cane or beet sugar	1701	SGR	57 303
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	25 470
Ethyl alcohol, undenat., und. 80% alc., spirit bev. etc.	2208	B_T	14 029
Crustaceans, live, fresh etc., and cooked etc.	0306p	OFD	7 197
Fruit juices (and grape must) and veg. juice, no spirit	2009	OFD	3 689

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Democratic Republic of the Congo			
Tobacco, unmanufactured, tobacco refuse	2401	OCR	2 268
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	1 906
Plants etc. for pharmacy, perfume, insecticides	1211	OCR	863
Palm oil and its fractions	1511	VOL	758
Cane or beet sugar	1701	SGR	742
Djibouti			
Other live animals	0106	OAP	3 415
Live sheep	0104	CTL	1 258
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	1 246
Live bovine animals	0102	CTL	806
Leguminous vegetables, dried shelled	0713	V_F	263
Dominica			
Bananas	0803	V_F	435
Vegetables n.e.s.o.i., fresh or chilled	0709	V_F	215
Cocoa beans	1801	OCR	189
Molasses from the extraction or refining of sugar	1703	SGR	184
Food preparations n.e.s.o.i.	2106	OFD	108
Dominican Republic			
Bananas	0803	V_F	41 635
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	40 939
Cocoa beans,	1801	OCR	19 495
Cane or beet sugar	1701	SGR	16 722
Ethyl alcohol, undenat., und. 80% alc., spirit bev. etc.	2208	B_T	15 537
Fiji			
Waters, natural etc., not sweetened etc., ice and snow	2201	B_T	16 106
Prep. or pres. fish, caviar and caviar substitutes	1604	OFD	7 006
Cane or beet sugar	1701	SGR	6 534
Fish, frozen	0303	OFD	4 792
Fish fillets , fresh, chilled or frozen	0304	OFD	4 672
Gabon			
Tobacco and tobacco subst. mfrs. n.e.s.o.i.	2403	B_T	2 192
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	389
Bran, sharps etc.	2302	OFD	283
Cocoa beans,	1801	OCR	203
Fish, dried, salted etc., smoked etc.	0305	OFD	151
Gambia			
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	2 884
Cocoa beans,	1801	OCR	2 586
Peanut oil and its fractions	1508	VOL	976
Fish, frozen	0303	OFD	648
Peanuts	1202	OSD	530

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Ghana			
Cocoa beans,	1801	OCR	249 751
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	147 321
Cocoa paste	1803	OFD	47 995
Cocoa butter, fat and oil	1804	OFD	20 805
Cocoa powder, not sweetened	1805	OFD	15 095
Grenada			
Nutmeg, mace and cardamoms	0908	OCR	1 234
Cocoa beans	1801	OCR	734
Wheat or meslin flour	1101	OFD	376
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	285
Preparations used in animal feeding	2309	OFD	117
Guinea			
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	5 415
Cocoa beans	1801	OCR	4 572
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	2 307
Fish, frozen	0303	OFD	2 140
Fish, dried, salted etc., smoked etc.	0305	OFD	1 045
Guinea-Bissau			
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	17 976
Fish, frozen	0303	OFD	1 192
Flaxseed (linseed)	1205	OSD	1 076
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	145
Cocoa beans	1801	OCR	75
Guyana			
Cane or beet sugar	1701	SGR	14 495
Rice	1006p	PDR	10 063
Crustaceans, live, fresh etc., and cooked etc.	0306p	OFD	4 801
Ethyl alcohol, undenat., und. 80% alc., spirit bev. etc.	2208	B_T	3 096
Rice	1006p	PCR	2 976
Haiti			
Cocoa beans	1801	OCR	1 573
Dates, figs, pineapples, avocados	0804	V_F	1 193
Crustaceans, live, fresh etc., and cooked etc.	0306p	OFD	547
Molluscs and aquatic invertebrates n.e.s.o.i.	0307p	OFD	425
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	315
Jamaica			
Ethyl alcohol, undenat., n/un. 80% alc., alcohol, denat.	2207	B_T	17 095
Cane or beet sugar	1701	SGR	13 133
Ethyl alcohol, undenat., und. 80% alc., spirit bev. etc.	2208	B_T	6 808
Beer made from malt	2203	B_T	4 024
Cassava	0714	V_F	2 755

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Kenya			
Tea	0902p	OCR	99 020
Cut flowers and buds for bouquet etc.	0603	OCR	61 125
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	28 688
Leguminous vegetables	0708	V_F	20 197
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	9 538
Lesotho			
Cotton, not carded or combed	5201	PFB	727
Wool, not carded or combed	5101p	WOL	256
Plants etc. for pharmacy, perfume, insecticides	1211	OCR	22
Citrus fruit	0805	V_F	20
Cereal grouts	1103	OFD	18
Madagascar			
Cloves	0907	OCR	41 136
Crustaceans, live, fresh etc., and cooked etc.	0306p	OFD	11 597
Vanilla beans	0905	OCR	7 620
Prep. or pres. fish, caviar and caviar substitutes	1604	OFD	5 434
Cane or beet sugar	1701	SGR	4 934
Malawi			
Tobacco, unmanufactured, tobacco refuse	2401	OCR	65 366
Cane or beet sugar	1701	SGR	14 930
Tea	0902p	OCR	8 924
Corn (maize)	1005	GRO	7 509
Peanuts	1202	OSD	7 147
Mali			
Cotton, not carded or combed	5201	PFB	41 651
Live bovine animals	0102	CTL	5 420
Oil seeds and oleaginous fruits	1207	OSD	4 286
Live sheep	0104	CTL	1 969
Dates, figs, pineapples, avocados	0804	V_F	799
Mauritania			
Fish, frozen	0303	OFD	38 005
Molluscs and aquatic invertebrates n.e.s.o.i.	0307p	OFD	28 146
Flour, meal etc. of meat etc., not for human: greavs	2301p	OFD	5 907
Crustaceans molluscs etc. prepared or preserved	1605	OFD	1 797
Fats and oils, their fractions, fish and marine mammal	1504	OMT	1 006
Mauritius			
Cane or beet sugar	1701	SGR	37 335
Prep. or pres. fish, caviar and caviar substitutes	1604	OFD	33 305
Fish, frozen	0303	OFD	4 163
Other live animals	0106	OAP	2 828
Molasses from the extraction or refining of sugar	1703	SGR	2 588

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Namibia			
Fish fillets, fresh, chilled or frozen	0304	OFD	26 691
Fish, frozen	0303	OFD	21 353
Grapes	0806	V_F	6 673
Meat of bovine animals, fresh or chilled	0201	CMT	6 665
Beer made from malt	2203	B_T	3 532
Niger			
Onions, shallots, garlic, leeks etc.	0703	V_F	1 331
Oil seeds and oleaginous fruits	1207	OSD	455
Cotton, not carded or combed	5201	PFB	276
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	239
Leguminous vegetables, dried shelled	0713	V_F	229
Nigeria			
Cocoa beans,	1801	OCR	82 531
Oil seeds and oleaginous fruits	1207	OSD	21 278
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	15 810
Cocoa butter, fat and oil	1804	OFD	14 795
Cotton, not carded or combed	5201	PFB	7 800
Papua New Guinea			
Palm oil and its fractions	1511	VOL	62 361
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	31 483
Cocoa beans	1801	OCR	19 697
Prep. or pres. fish, caviar and caviar substitutes	1604	OFD	14 057
Coconut, palm kernel or babassu oil etc.	1513	VOL	12 667
Rwanda			
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	8 916
Tea	0902p	OCR	8 865
Corn (maize)	1005	GRO	1 986
Wheat or meslin flour	1101	OFD	1 396
Coffee, coffee husks etc., substitutes with coffee	0901p	OFD	1 099
Saint Kitts and Nevis			
Beer made from malt	2203	B_T	186
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	129
Ethyl alcohol, undenat., und 80% alc., spirit bev. etc.	2208	B_T	79
Other live animals	0106	OAP	44
Sauces and prep., mixed condiments, mustard flour etc.	2103	OFD	14
Saint Lucia			
Bananas	0803	V_F	1 655
Beer made from malt	2203	B_T	1 251
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	289
Ethyl alcohol, undenat., und 80% alc., spirit bev. etc.	2208	B_T	118
Sauces and prep., mixed condiments, mustard flour, etc.	2103	OFD	64

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Saint Vincent and the Grenadines			
Wheat or meslin flour	1101	OFD	967
Bananas	0803	V_F	466
Cassava	0714	V_F	395
Rice	1006p	PDR	309
Preparations used in animal feeding	2309	OFD	281
Samoa			
Fish, frozen	0303	OFD	471
Coconut, palm kernel or babassu oil etc.	1513	VOL	174
Fruit juices (and grape must) and veg. juice, no spirit	2009	OFD	150
Waters, natural etc., not sweetened etc., ice and snow	2201	B_T	72
Food preparations n.e.s.o.i.	2106	OFD	37
Senegal			
Fish, frozen	0303	OFD	12 558
Molluscs and aquatic invertebrates n.e.s.o.i.	0307p	OFD	10 521
Peanut oil and its fractions	1508	VOL	9 683
Soups, broths and preps., homogenized comp. food preps.	2104	OFD	6 202
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	4 455
Sierra Leone			
Cocoa beans	1801	OCR	6 617
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	979
Cane or beet sugar	1701	SGR	750
Crustaceans molluscs etc. prepared or preserved	1605	OFD	287
Milk and cream, concentrated or sweetened	0402	MIL	202
Solomon Islands			
Palm oil and its fractions	1511	VOL	4 890
Fish, frozen	0303	OFD	3 544
Prep. or pres. fish, caviar and caviar substitutes	1604	OFD	3 200
Cocoa beans	1801	OCR	1 601
Copra	1203	OSD	1 090
South Africa			
Citrus fruit	0805	V_F	137 995
Corn (maize)	1005	GRO	97 601
Wine of fresh grapes, grape must n.e.s.o.i.	2204	B_T	90 772
Grapes	0806	V_F	83 879
Apples	0808	V_F	59 696
Suriname			
Bananas	0803	V_F	7 192
Rice	1006p	PDR	3 530
Fish, frozen	0303	OFD	3 271
Crustaceans, live, fresh etc., and cooked etc.	0306p	OFD	2 883
Rice	1006p	PCR	2 809

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Swaziland			
Cane or beet sugar	1701	SGR	27 095
Food preparations n.e.s.o.i.	2106	OFD	8 305
Citrus fruit	0805	V_F	3 150
Ethyl alcohol, undenat., n/un. 80% alc., alcohol, denat.	2207	B_T	2 381
Fruit, nuts etc. prepared or preserved	2008	OFD	1 822
Togo			
Cocoa beans	1801	OCR	37 872
Cotton, not carded or combed	5201	PFB	10 397
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	8 301
Oil seeds and oleaginous fruits	1207	OSD	2 065
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	1 442
Tonga			
Plants etc. for pharmacy, perfume, insecticides	1211	OCR	331
Vegetables n.e.s.o.i., fresh or chilled	0709	V_F	304
Molluscs and aquatic invertebrates n.e.s.o.i.	0307p	OFD	298
Cocoa beans	1801	OCR	179
Cassava	0714	V_F	116
Trinidad and Tobago			
Ethyl alcohol, undenat., n/un. 80% alc., alcohol, denat.	2207	B_T	14 808
Waters, sweetened etc. and other nonalc. beverages n.e.s.o.i.	2202	B_T	7 036
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	4 913
Foods prep. by swell. cereal	1904	OFD	3 028
Bread, pastry cakes etc.	1905	OFD	2 969
Uganda			
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	45 485
Tobacco, unmanufactured, tobacco refuse	2401	OCR	13 587
Fish fillets, fresh, chilled or frozen	0304	OFD	11 077
Cane or beet sugar	1701	SGR	9 436
Oil seeds and oleaginous fruits	1207	OSD	8 040
United Republic of Tanzania			
Tobacco, unmanufactured, tobacco refuse	2401	OCR	31 023
Coffee, coffee husks etc., substitutes with coffee	0901p	OCR	19 573
Cotton, not carded or combed	5201	PFB	19 097
Coconuts, brazil nuts and cashew nuts, fresh or dry	0801	V_F	16 683
Fish fillets, fresh, chilled or frozen	0304	OFD	15 708
Vanuatu			
Fish, frozen	0303	OFD	22 112
Coconut, palm kernel or babassu oil etc.	1513	VOL	1 181
Cocoa beans,	1801	OCR	567
Copra	1203	OSD	503
Meat of bovine animals, frozen	0202	CMT	255

Table A10. Major agricultural exports for ACP WTO members (continued)

Country	HS code	GTAP code	\$ millions
Zambia			
Corn (maize)	1005	GRO	31 365
Tobacco, unmanufactured, tobacco refuse	2401	OCR	29 181
Cane or beet sugar	1701	SGR	22 919
Cotton, not carded or combed	5201	PFB	14 479
Barley	1003	GRO	3 858
Zimbabwe			
Tobacco, unmanufactured, tobacco refuse	2401	OCR	65 701
Cotton, not carded or combed	5201	PFB	24 277
Cane or beet sugar	1701	SGR	21 766
Citrus fruit	0805	V_F	2 889
Cigars, cigarettes etc., of tobacco or substitutes	2402	B_T	2 704

Source: TASTE database. "p" denotes partial.

Note: n.e.s.o.i. = not elsewhere specified or indicated.

