

No.157/June 2006

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Alan Matthews

Department of Economics and Institute for International
Integration Studies
Trinity College Dublin

Keith Walsh

Department of Economics and Institute for International
Integration Studies
Trinity College Dublin



IIS Discussion Paper No. 157

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The Doha Development Agenda: Mixed Prospects for Developing Countries

Alan Matthews and Keith Walsh¹

Abstract. This paper uses the GTAP computable general equilibrium model to assess the impact of a Doha Development Agenda agreement on agricultural trade liberalisation. In particular, we examine the consequences for developing countries. The simulation incorporates further liberalisation in the areas of market access, export competition and domestic support. Most developing regions can expect strong positive results from this liberalisation, however some suffer a decrease in welfare. The magnitude of the welfare effect for these countries depends on measures to be taken by developing countries themselves, and whether they will materialise must be uncertain. The results highlight the importance of the impact of further liberalisation of the erosion of preferential trading arrangements enjoyed by developing regions.

Keywords. Agricultural trade liberalisation, GTAP, developing countries

JEL classification. F13, Q17, Q18

Acknowledgements. This paper is an output of the Policy Coherence project based in the Institute for International Integration Studies and supported by a research grant from the Advisory Board for Irish Aid. Further details can be found on the project website, available at www.tcd.ie/iis/policycoherence. We are grateful for comments and suggestions from M. Ivanic, J.C. Bureau, and seminar participants at the authors' presentations in Trinity College and at the 20th Annual Conference of the Irish Economic Association. The views expressed in this paper remain the responsibility of the authors and should not be taken to reflect the views of any of the mentioned organisations. Any remaining errors are our own. Walsh gratefully acknowledges the financial support of the Institute for International Integration Studies and the Irish Research Council for the Humanities and Social Sciences.

¹ Department of Economics & Institute for International Integration Studies, Trinity College, Dublin.

1 Introduction

In Doha, Qatar, in November 2001, the World Trade Organisation (WTO) launched a new round of trade negotiations. With the deadline for the completion of the negotiations initially set for 2005, the topics under negotiation are wide-ranging. A successful outcome would have long-term effects on all countries involved. Despite the failure of the Cancún Ministerial meeting in September 2003, WTO Members have signalled their determination to reach a new agreement. In July 2004 a framework for further negotiations was established, further progress was made on the modalities of the Round at the Hong Kong Ministerial Council in December 2005, with the expectation of a final agreement to be concluded in 2006.

The aim of this paper is to quantify the potential outcomes for different countries of a Doha Round agreement on agricultural trade liberalisation. The Doha Round has been termed the 'Doha Development Agenda', as one of the principal ambitions set out in the Doha Declaration is that this Round should consider the needs of developing countries and that its outcome should be beneficial to them. Reflecting this, the paper examines the consequences for developing countries of the Round. As developing countries are not a homogenous group and therefore their responses to further trade liberalisation are expected to vary, special attention is given to considering the relative outcomes for two of the poorest groups of developing countries, defined as the EBA group (Least Developed Countries benefiting from the EU's Everything But Arms initiative) and the Rest of ACP group (other African, Caribbean and Pacific countries which benefit from preferential access to the EU market under the Cotonou Agreement but on less generous terms than the EBA group).

The Doha negotiations are comprehensive both in terms of their country coverage (nearly all countries are now WTO members) and sectoral coverage (they cover liberalisation of agricultural, manufacturing and services trade as well as clarification of WTO rules). The focus of this paper is on the global liberalisation of trade in agricultural commodities. To quantify the effects of such an agreement requires the use of a model of the global economy.

The model used in this study, the Global Trade Analysis Project (GTAP) model and database, is well suited for modelling the impact of changes in the world trading system. It is a comparative static, multi-regional, computable general equilibrium (CGE) model of the world economy, with over eighty regions and fifty sectors separately distinguished. All markets in the model are perfectly competitive and exhibit constant returns to scale.

The base year of the latest version of the GTAP database, Version 6.0, is 2001. Even if WTO negotiations reach a successful conclusion in the near future, the

time-span for implementation and the impact of reforms will stretch over a number of years. With this in mind, the base data are projected forward to 2014 to allow more realistic modelling of the effects of any agreement. This baseline updates the GTAP database using macro-economic forecasts and by incorporating events including China's accession to the WTO, enlargement of the EU, the Agenda 2000 and Mid-Term Review reforms of the Common Agricultural Policy, the Everything But Arms (EBA) agreement and the elimination of MFA textile quotas. The simulation of trade liberalisation scenarios is then implemented by introducing shocks to this baseline.

Even prior to the launch of the Doha Development Agenda in 2001, research on the potential effects of further trade liberalisation from a new Round had begun. As a primary aim of the Doha Round is the promotion of the development needs of less developed countries, a considerable body of literature on the subject has already been undertaken. Charlton and Stiglitz (2005) provide a survey of a range of CGE-based estimates of the welfare gains to the world economy. The magnitude of the results varies between studies, with the majority indicating that industrialised countries expect to achieve the largest share of the gains from liberalisation. This effect is particularly strong in the areas of agricultural and service liberalisation but holds for other sectors also.

The effects for developing countries are generally found to be smaller, however most studies conclude that they will benefit in welfare terms from further liberalisation. When the welfare gains are measured as a percentage of GDP rather than in absolute terms, in many cases the relative gains to developing countries will be greater than those achieved by the industrialised nations. Anderson and Martin (2005) calculate the gains from the complete removal of protection on agricultural and manufacturing goods to be worth 1.2 per cent and 0.6 per cent of GDP for developing and industrialised countries respectively.

As noted above, developing countries are not homogeneous. For example, they vary in terms of their level of economic development, their comparative advantage in different commodities and in their trading relationship with other countries and regions. Bouet *et al.* (2004) highlight the importance of accurately accounting for three factors: the choice of disaggregation of the developing countries, the degree of overhang (in tariffs and domestic support) and the existence of preferential agreements. Their estimates of the global welfare gains, and the gains to developing countries, are considerably lower than much of the previous literature.

The trade liberalisation scenario implemented in this paper incorporates the three pillars of the Uruguay Round Agreement on Agriculture: market access, domestic support and export competition. This paper examines specifically the effects of further agricultural trade liberalisation on the global economy as well as looking

in detail at two issues that will affect the outcomes for the poorest developing countries.

First, the trade liberalisation scenario simulated in this paper is broken down between the impact of liberalisation by industrialised and developing countries. The GTAP model allows for the shocks applied to the various regions to be altered, allowing us to simulate special and differential treatment of developing countries and give specific attention to analysing the impacts upon them.

Second, by comparing the outcomes for two similar groups of developing countries that enjoy different preferential trading arrangements with the European Union, we can demonstrate the effects of the erosion of this advantage as further liberalisation forces the EU to reduce the margin of preference accorded to these regions. These two groups are also distinguished in that they will be asked to undertake different levels of commitments with respect to their own liberalisation under a Doha Round Agreement. The importance of these differences are underlined by the following analysis.

The paper is structured as follows. The next section describes the process of projecting the world economy forward to 2014 and the structural changes that result. Section 3 outlines the trade liberalisation scenario simulated in this paper and presents the results of this simulation. Section 4 presents the conclusions.

2 Methodology

2.1 The Global Trade Analysis Project (GTAP) Model and Database

The empirical work undertaken in this paper employs the computable general equilibrium (CGE) model and database known as GTAP. This type of model is a powerful tool enabling quantitative analysis of trade issues. GTAP in particular, with its wide country coverage and extensive database, is designed for precisely this task.

GTAP is a one period model, multi-regional, CGE model. All markets in the model are perfectly competitive and exhibit constant returns to scale. This paper employs the standard model, however it can be extensively modified to suit more particular modelling requirements. The primary reference for information on the model is Hertel (1997) and the GTAP website.²

The world economy consists of eighty-seven economies (referred to in the model as “regions”) and fifty-seven sectors/commodities interlinked via demand and production linkages within regions, and bilateral trade flows between them. The structure of these regions is the same. Each provides an elaborate representation of the economy including the interactions between the agents in the model

² GTAP website: www.gtap.org.

(private households, government and firms) and linkages between all of world production and trade. The number of sectors is the same in each region and all commodities are produced in every region. The Armington (1969) assumption is used to differentiate between homogenous commodities from different regions.

The construction and calibration of the database is documented in Dimaranan and McDougall (2005). The database is composed of three elements: national input-output tables for each region represented in the model, international trade data linking the regions and protection data. The base year of the current version is 2001 and all data is represented in 2001 US dollars.

2.2 Model Closure

A standard general equilibrium closure is used in all simulations in this study. This implies all prices (except the numeraire)³, regional incomes and quantities of producible commodities are determined endogenously. Tax (or subsidy) rates, technology and factor endowments are exogenously fixed. A medium-term closure is assumed. Labour and capital are assumed to be perfectly mobile between sectors. Land and natural resources are imperfectly mobile (or sluggish) between sectors. No factor endowments are mobile between regions and all are assumed to be fully employed within regions (there is no unemployment of labour or capital). In terms of macroeconomic closure, investment is savings-driven and the current balance is assumed to be exogenous.

Policy interventions (tax and subsidies) are modelled as price wedges. GTAP does not track individual taxes and subsidies. The value of an intervention is calculated by comparing values of transactions at agent and market prices or market and world prices. Any difference between them is due to a policy intervention. Whether this intervention has a positive or negative impact on prices depends on the net effect of the taxes and subsidies. If taxes on a particular commodity are greater than the subsidies, then the market price will be above the agent price for that commodity.

2.3 Aggregation

In this paper, twenty regions are distinguished. Eleven are industrialised countries or regions: six regions representing EU countries, Rest of EFTA, the USA, Canada, the Former Soviet Union and High-Income Asian countries. The remaining nine regions are developing countries or groups of countries. India and China are individually distinguished, also represented are the Mercosur group of countries, the Mediterranean rim countries and remaining Asian and Latin

³ Because all prices are endogenous in a CGE model, one price (or price index) must be chosen as a numeraire in which to express relative price changes. In this closure, the numeraire is a composite world price index of primary factors.

American countries.⁴ The Everything But Arms (EBA) group of least developed countries is represented, although the GTAP aggregation does not permit the inclusion of all fifty EBA countries in this region, as many are not individually represented in the database.⁵ The Rest of ACP region encompasses the remaining African-Pacific-Caribbean (ACP) countries that do not qualify for the EBA.⁶

On the sectoral level, nine agri-food sectors have been distinguished, consisting both of primary agriculture and processed products. There are also nine manufacturing industries and five service sectors. Table 1 shows the full regional and sectoral aggregation chosen in this paper.

2.4 Construction of the Baseline 2001 - 2014

The base year of the current version 6.0 of the GTAP database is 2001. Even if WTO negotiations reach a successful conclusion in the near future, the time-span for implementation and impact of reforms will stretch over a number of years. With this in mind, the base data are projected forward until 2014 to allow more realistic modelling of the effects of any agreement. In addition, the standard GTAP model is extended to incorporate the agricultural budget of the European Union in order to capture the impact of further agricultural trade liberalisation on the net flow of funds between EU member states arising from EU agricultural policy.

The construction of this baseline is achieved by running a pre-simulation experiment, the outcome of which is used as a baseline against which to compare the results of the trade liberalisations scenarios implemented in the study. The construction of the baseline is divided into two components. First, policy changes, both events that have already occurred since 2001 and those that are expected to occur in the future, are implemented to create a more realistic policy landscape. Second, macroeconomic projections are used to simulate the expected changes to the world economy between the dates in question.

The structural changes to the world economy included in this baseline are: the accession of the People's Republic of China to the WTO; the Agenda 2000 and Mid-term Review reforms of the CAP; the accession of twelve central and eastern European Countries to the EU; the full implementation of the Everything-But-Arms (EBA) Agreement;⁷ and the elimination of Multi-Fibre Agreement textile

⁴ We assume the Rest of the World region to be a developing region also.

⁵ EBA countries individually represented in the GTAP database are: Malawi, Mozambique, Tanzania, Zambia, Madagascar, Uganda and Bangladesh. We also include the Rest of SADC and the Rest of Sub-Saharan Africa in the EBA region.

⁶ The same caveat applies the aggregated Rest of ACP region. Separately disaggregated in this region are Zimbabwe, Botswana, Rest of Caribbean and Central America.

⁷ The EBA agreement covers trade between the EU and fifty of the world's least developed countries. Simply put, the EU has agreed to the unilateral elimination of tariffs and quotas on imports from these countries, on all commodities except those related to the arms trade. Effective from 2001 for most

quotas as foreseen under the Agreement on Textiles and Clothes.⁸ We also assume that Russia joins the WTO during the baseline period. The terms of accession are not specifically modelled, but Russia is assumed to participate in the liberalisation scenarios based on its tariff structure in 2001.⁹

The second phase in constructing the baseline to 2014 is to shock factor endowments in the model following the approach of Walmsley *et al.* (2000). These shocks are based on forecasts of factor growth rates over the baseline period. GDP, skilled and unskilled labour, population and capital stock in each region are shocked. The main source is Brockmeier and Salamon (2003) with additional data from Jensen and Frandsen (2003).¹⁰

2.4 The EU Agricultural Budget Module

In the standard GTAP model there is no direct link between tax revenue and government expenditure and there is no explicit representation of the EU budget.¹¹ Agricultural subsidies (direct payments, input and output subsidies, market price support and export subsidies) are assumed entirely financed through the regional household of each country or region, and there are no intra-European revenue or expenditure flows. This underestimates the negative impact of reforms which lower market prices and thus the inflow of CAP funds for a net exporting country in the EU.

To accurately model shocks such as enlargement or, at a later stage, to simulate the effects of trade liberalisation within a regional union such as the EU, the standard GTAP model is extended to incorporate an EU agricultural budget module based on the approach of Brockmeier (2003). This is accomplished via the addition of a new social accounting matrix (SAM). This SAM moves the EAGGF

products, the EBA agreement was fully phased in by beginning 2004. Full market access will be delayed for some sensitive products: sugar (July 2009), rice (September 2009) and bananas (January 2006), however all import tariffs on goods from the EBA region to the EU are assumed to be fully eliminated by the end of the baseline period.

⁸ There is disagreement about how appropriate it is to include the CAP MTR and indeed the EU's EBA scheme as part of the baseline in measuring the impact of the Doha Round Agreement. The starting point for a new Agreement is the Uruguay Round baseline of bound tariffs, export subsidy disciplines and ceilings on trade-distorting domestic support. Arguably, the EU undertook the MTR in part to allow it to make a meaningful offer in the Doha Round negotiations. Similarly, part of the motivation for the introduction of the EBA scheme was to bolster its credentials in supporting a pro-development outcome in these negotiations (Matthews and Gallezot, 2006). We agree in principle that this is the correct way to measure the full impact of a successful Doha Round Agreement. However, because we are interested in exploring the differential effect of trade liberalisation on developing countries with different levels of pre-existing access to third country markets, for the purposes of this paper we incorporate these EU reforms into the baseline.

⁹ The way these policy changes are modelled is explained in greater detail in Matthews and Walsh (2005).

¹⁰ See Matthews and Walsh (2005) for the details of these factor endowment shocks.

¹¹ All taxes (or subsidies) are collected (or disbursed) by a regional household and there are no flows between regions.

revenues and expenditures from the regional household to the EU budget. The EU collects 75% of import tariff revenues from agents in the model and a GDP¹² tax is levied on the regional households of the member regions. This tax is determined endogenously to ensure the overall EU agricultural budget is balanced and it thus approximates both the VAT and GDP elements of revenue that accrue to the EU. The difference between revenues and expenditures of each member state is the net transfer to that region arising from the operation of the CAP. The sum of the net transfers of each region is zero to ensure that the overall agricultural budget balances.

2.5 Changes to Developing Countries over the Baseline 2001-2014

This section describes the changes in the structures of developing country economies over the period of the baseline 2001-2014. In particular, we focus on the changes for the Everything But Arms (EBA) group of the world's poorest countries and the Rest of the African-Caribbean-Pacific (ACP) region countries (Tables 2 and 3 respectively). It is the structure of the world economy in 2014 that will determine the impact of WTO liberalisation, rather than economic and protection structures in 2001.

In the baseline period the average GDP growth rate is 6.2 per cent, with most developing countries regions growing at a rate close to the average. The EBA region grows slightly faster than average in GDP terms, however in capital accumulation and skilled labour terms, the region is projected to perform less well.

The dependence of EBA countries on exports of primary products (primarily minerals and oil) as well as textiles is highlighted by the self-sufficiency indicators in Table 2. Domestic output in the EBA region increases across all sectors with particularly strong growth projected in sugar (among primary commodities), the transport and electronic sectors (in industry) and public services. This is driven by higher domestic consumption and by increased exports in these sectors. The changes reflect a shift from consumption of agricultural products to industrial goods as the region grows and becomes richer over the period of the baseline. Exports to EU and non-EU markets both increase, by approximately 30 per cent and 50 per cent respectively, encouraged in part by implementation of the EU's EBA scheme.

Unlike the EBA region, the export surplus of the Rest of the ACP region is driven by high ratios of output to domestic consumption in the crops, sugar and transport services sectors (Table 3). Changes for the Rest of ACP region are broadly similar, if less pronounced, than for the EBA region. Output in the textiles and clothing sector increases by less than the average in both regions, and

¹² In reality, the EU taxes gross national income (GNI), however in GTAP any such taxes are levied on the regional household.

indeed exports from the Rest of ACP region in this sector are projected to fall, reflecting the more intense competition from Asia, and in particular China, following the removal of MFA quotas.

3 Trade Liberalisation: Simulation and Results

This section describes the agricultural trade liberalisation scenario implemented in this paper and presents the results. The scenario incorporates reductions in agricultural import tariffs, domestic support and export subsidies. This simulation is stylised because there is as yet no agreement on the modalities of a final agreement. Our simulation is based on the Framework Agreement reached in July 2004.¹³ As the Framework Agreement contains few specific figures or targets, certain assumptions have been made.

Special and differential treatment (SDT) of developing countries (DCs) is incorporated in the scenario where appropriate. As noted in Section 2.3, the aggregation chosen in this paper features eleven industrialised country (IC) regions and nine developing country regions. The EBA group of developing countries are assumed to be the world poorest or least developed countries (LDC). Unless otherwise noted, SDT is assumed to imply that DCs implement two-thirds of the level of commitments (e.g., a tariff cut) undertaken by ICs and that LDCs are exempted any reduction commitments.

The trade liberalisation shocks are implemented using the updated database created from the baseline experiments described in the previous section. The shocks required to implement the trade liberalisation scenario are thus implemented against this baseline featuring the global economy as projected in 2014.

To aid in the analysis of the outcomes, the results of each simulation are decomposed into the effects due to liberalisation of ICs and effects due to liberalisation in DCs. A feature of GEMPACK (the software package used to implement the GTAP model) allows for the results of any particular shock in a simulation to be decomposed into parts known as “subtotals”. Subtotals may be decomposed by region (in the example above) or by commodity. The sum of subtotals need not necessarily equal the total result, as will be the case if all component parts of a shock are not specified.¹⁴

¹³ Details of July 2004 agreement available at www.wto.org.

¹⁴ For more information on GEMPACK, see Harrison and Pearson (1994) and www.gempack.com. See Harrison *et al.* (1999) for more detailed discussion of the decomposition of results and the subtotal feature.

3.1 Simulation Design

3.1.1 Market Access

Applied agricultural import tariffs are cut by 50 per cent in this simulation. The cut is a linear across all agricultural sectors. To reflect the special and differential treatment of DCs, the import tariffs of these regions are subjected to a 34 per cent reduction, and LDCs are exempted from any reduction commitment.

The tariff rates in the GTAP model and database are effective (or applied) rates. WTO negotiations are based on bound tariff levels. In many cases, there will be a degree of tariff overhang whereby the bound ceiling exceeds the applied rate by a considerable amount. A 50 per cent in the bound rate may not translate into an equal reduction in applied rates. This is particularly the case in DCs but can also occur in ICs. Implementing reductions in applied rates by 50 per cent, as done in this study, may overestimate the gains from trade liberalisation unless the average cut in bound rates agreed in the Doha Round negotiations is substantially greater. In other words, cutting applied tariffs by 50 per cent implies agreement on a substantially larger cut in bound tariffs once the tariff overhang impact is factored in.

3.1.2 Export Competition

The July 2004 Framework contains a commitment to fully phase out the use of export subsidies for agricultural products and therefore their complete elimination has been implemented in the simulation.

3.1.3 Domestic Support

On domestic support, the only firm commitment contained in the Framework is the agreement that overall trade distorting support will not exceed 80 per cent of its current level by the end of the first year. This includes final bound AMS (aggregate measure of support), the permitted *de minimis* levels and permitted blue box levels, with future reductions to be based on a tiered formula implying greater reductions for those countries that maintain the highest levels of support.

Domestic support as currently represented in the GTAP model does not allow for a full analysis of overall distorting support as defined in the July Framework. In this simulation, reductions in domestic support are simulated as cuts to direct payments linked to production, intermediate input subsidies and output subsidies. Payments decoupled from production in the EU and USA are assumed to qualify for the Green Box and therefore are exempt from reductions. The market price support components of AMS are not modelled. The scenario implemented is a modest reduction of 20 per cent for non-exempt support in the EU and USA and 5 per cent for all other regions reflecting the tiered formula approach whereby those with higher levels of trade distorting support are expected to implement the

most substantial cuts.¹⁵ As in the case of market access, results are decomposed by the source of the reductions.

Box 1: Summary of Simulation

Market Access:

Applied agricultural import tariffs are reduced by 50, 34 and 0 per cent for industrialised, developing and least developed countries respectively.

Domestic Support:

Trade-distorting domestic support is reduced by 20 per cent in the EU and USA and by 5 per cent elsewhere.

Export Competition:

A global elimination of agricultural export subsidies.

3.2 Results

The results of the experiment outlined above are presented in this section. The overall effects for the world economy and the share of the gains to developing countries are first discussed. This is followed by more detailed analysis of the impacts on developing countries of further liberalisation as simulated in this study and an explanation of the factors driving these results. All results presented are net of the effect of the macro-economic projections and policy changes built into the baseline, allowing the isolation of the effects due to the various trade liberalisation scenarios and the results are decomposed by liberalisation by industrialised country (IC) and developing country (DC) regions.

3.2.1 Global Effects

The global change in welfare as measured by the equivalent variation in millions of US dollars and as a percentage of Gross Domestic Product in 2014, are presented in Table 4.¹⁶ The net result is a gain for the world economy as whole of

¹⁵ The same caveat as discussed in Section 3.1.1, regarding differences in bound and applied tariff rates and the degree of overhang, applies in this simulation also. Applied domestic support is cut by 20 per cent, the bound level of support and the degree of overhang is not considered.

¹⁶ In GTAP, the change in a region's welfare as the result of a shock is measured as the equivalent variation in income – the amount of money that the consumer would be willing to pay to avoid a price change. It measures the change in regional household's utility expressed in monetary terms (2001 US\$).

0.05 per cent of gross domestic product (GDP). The modest nature of the estimated gains reflects, in part, the nature of the model being used (a static, one-period model assuming fixed resources and perfect competition, so the only source of gains from trade liberalisation arise from the reallocation of resources between sectors and any consequential terms of trade effects on individual countries). They also reflect the limited nature of the trade liberalisation scenario which is undertaken (a partial reduction in tariffs and other trade-distorting measures, but only in the agricultural sector). The liberalisation of all three pillars generates positive welfare impacts overall, with the largest contribution from tariff reductions, followed by domestic support and export subsidies.

Across the different regions identified in the model, the results are more mixed. The major winners are the countries that impose the most significant distortions on agricultural trade and it is typical in such simulations to observe welfare gains due to improved allocative efficiency when these distortions are reduced. Net exporters of agricultural commodities, such as the Mercosur region, also perform strongly. The EU gains from the export subsidy elimination at the expense of net-food importing regions. The effect of the reduction in agricultural tariffs is considerably greater in magnitude than the cuts in domestic support and the elimination of agricultural export subsidies.

3.2.2 Overview of Results for Developing Countries

Eight of the twenty regions disaggregated in this study are considered to be DCs. This section presents the results for DCs overall, whilst the following section focuses on two of these groups of countries in more detail.

As Table 4 shows, in GDP terms, the Rest of ACP, Mercosur and the Rest of World are the biggest winners in welfare terms. Their gains are considerably above the world average. Four DC regions, the EBA group, China, Rest of Latin America and the Mediterranean, suffer a welfare loss from liberalisation. Table 4 also confirms the importance of tariff reductions, compared to domestic support cuts and export subsidy elimination, to the total welfare gain for developing countries. The relatively small contribution from domestic support arises from the modest nature of the cuts assumed and the exemption of non-trade distorting support from reductions.

In Table 5, the distribution of the global welfare gains compares the contribution by regions implementing reform to those that capture the benefits. At the global level, approximately 85 per cent of the welfare gains are due to liberalisation of ICs compared to 15 per cent from DC liberalisation. The main source of gains for ICs is liberalisation by ICs themselves, but the gains for DCs derive almost equally from liberalisation by ICs and liberalisation from within their own group of countries. Whilst DCs gains from increased access to IC markets as a result of

lower import tariffs imposed on their exports, they also increase their welfare as a result of allocative efficiency gains from reducing their own tariff protection.

Changes in wages are shown in Table 9, calculated as the change in the ratio of the returns to skilled and unskilled labour to the CPI in each region, respectively. These results reinforce the welfare change results. Regions that enjoy improved welfare from liberalisation will also see returns to labour also increase, with a likely positive impact on poverty.

3.3.3 Factors Underlying the Impacts of Liberalisation on Developing Regions

In this section, the results of the EBA region and the Rest of the ACP region are examined in detail. This comparison is revealing for two reasons. First, between them these regions represent most of the poorest countries in the study. The way in which they are affected by agricultural trade liberalisation is one measure of whether the Doha Round can live up to its promise to be a Development Round. Second, despite their similarities, they experience very different outcomes from further trade liberalisation as simulated in this paper. Comparison of the two illustrates the challenges and opportunities for DCs in the Doha Development Agenda.

As indicated in Table 4, the EBA group of countries experiences a decrease in its welfare resulting from trade liberalisation. By contrast, the Rest of ACP region is one of the biggest winners in GDP terms. By comparing the impact of liberalisation on these two regions, we identify and examine the two principal reasons for these differences: (i) the importance of allocative efficiency gains and the impact of special and differential treatment for DCs; and (ii) the impact of the erosion of preferential access to IC markets.

Allocative Efficiency Effects

As already noted, for most regions in this study, the major benefits are driven by their own trade liberalisation and the improvements in allocative efficiency that arise from the elimination of their own barriers to trade. The reduction in distortionary tariffs or subsidies allows resources within a country, which were previously tied up in subsidised sectors, to be reallocated to other sectors of the economy in which they will earn a higher return. Using these resources more efficiently increases the welfare of the region.

This is illustrated by the plight of the EBA region. Special and differential treatment (SDT) of developing countries implies that this region, composed of the least developed economies in the world, is exempt from commitments to liberalise. Their lack of liberalisation means they do not enjoy the gains in allocative efficiency that other regions achieve. This contrasts sharply with the outcome for the Rest of ACP group.

This is confirmed by Table 6, which shows the decomposition of the welfare change into allocative efficiency, terms of trade and investment-and-savings price effects, for the EBA and Rest of ACP regions. The contribution of allocative efficiency to welfare change for the EBA region is negative. The Rest of ACP by contrast enjoys strong welfare gains from improvements in allocative efficiency.

Erosion of Preferences

The second loss from trade liberalisation faced by the EBA region and, to a lesser degree, the Rest of ACP group arises from a loss of preferential access to IC markets, and particularly the EU market.¹⁷ Under the EBA Agreement, implemented in the baseline, all exports from this region receive tariff free access to EU markets. The Rest of ACP also receives preferential access to EU markets, granted under the Cotonou Agreement. However, the preference margin is considerably smaller as tariffs are still imposed on imports of many commodities from this region to the EU (see Table 3.3).

As tariffs on EBA exports to the EU are already abolished, further liberalisation is not possible between regions. However, the Common External Tariff of the EU, imposed on imports of third countries entering the EU, is reduced as part of the liberalisation process and thus third countries get to sell their goods more cheaply on the EU market. This erodes the preference margin of the EBA region exporters against third country producers and they face increased competition on EU markets.

Table 7 show an alternative decomposition of the welfare effects on the EBA and Rest of ACP regions of EU agricultural tariff liberalisation alone.¹⁸ In Table 7, the effect of reducing tariffs on agricultural goods from the region in question to the EU (Subtotal 3) illustrates the gains achieved by the Rest of ACP region from cuts in the tariffs faced by their exports to the EU (\$727 million) compared to same effect for the EBA region (\$0 as no such barriers remain to be cut). Whilst it might be expected that the impact of third country exporters gaining increased access to EU markets (Subtotal 7) would be negative for both regions, these welfare measures also capture some impacts on each region's terms of trade position from which it may benefit.

¹⁷ The Mediterranean rim countries also suffer a similar welfare loss resulting from the erosion of their preferential access to the EU.

¹⁸ The tariff liberalisation results for EBA and Rest of ACP are decomposed into eight subtotals representing the impact of reducing EBA/ACP import tariffs on goods from the EU (1) and from third countries (2) and the reduction on tariffs on EBA/ACP exports to the EU (3) and to the rest of the world (4). Subtotal (5) shows the impact of the reduction in imports tariffs on trade between EBA/ACP regions themselves. The next two subtotals calculate the impact on EBA/ACP of the reductions in EU tariffs on goods from the rest of the world (6) and of rest of the world tariffs on EU exports (7). Subtotal (8) calculates the residual effect from trade liberalisation between third regions.

4 Conclusions

The GTAP model is used to estimate the potential effects on the global economy of a successful conclusion to the Doha Round. Agricultural trade liberalisation as simulated in this paper consists of a stylised scenario, incorporating improvements in market access, domestic support and export competition. The shocks do not represent attempts to model specific modalities of the ongoing negotiations, rather they are broad measures designed to generate results that will be indicative of future changes. The simulation is implemented against a baseline projection of the world economy over the next decade.

Particular attention is given to comparing the differences in results of liberalisation by industrialised countries and by developing countries and on the analysis of the outcomes for the latter group. The focus is on the radically different projected outcomes for two of the poorest groups of developing countries, the Least Developed Countries (here called the EBA group) and other, mainly African countries which are part of the Rest of ACP group.

The study draws important conclusions about the likely impact of further agricultural trade liberalisation for developing countries. Most developing regions can expect strong positive results from a successful conclusion to the Round. However, these gains often depend on developing countries undertaking their own liberalisation, and whether will happen must be uncertain. One message of this study is that the removal of trade barriers by developing countries not only helps to reduce the costs of their own inappropriate domestic policies but also encourages imports from other developing countries as well.

The more direct impact of the removal of trade barriers by industrialised countries is more ambiguous. The Mercosur group, Rest of ACP countries and the Rest of the World (which includes Australia, New Zealand and South Africa) will benefit significantly. However, EBA countries and Mediterranean countries will lose because of the erosion of their benefits from preferential access to industrialised country markets, particularly the EU. If the poorest developing countries are to benefit from the Doha Round, this issue of preference erosion must be addressed. Development assistance to help these countries to improve their supply-side responses may be more important than further trade liberalisation *per se*.

5 Tables

Table 1: Regional and Sectoral Aggregation

Regions	Sectors
Ireland	Cereals, other crops and horticulture
United Kingdom	Sugar, plants and processed
Germany	Cattle and sheep
France	Other livestock (swine, poultry...)
Rest of EU15	Raw milk
New Members / Accession countries	Beef & sheepmeat (+ wool)
USA	Other meat products
Canada	Dairy
China	Beverages and tobacco
India	Other processed food products
Everything-But-Arms group of countries	Other primary products (extraction industries,
Mercosur	Textiles, leather and clothing
Rest of African Caribbean Pacific countries	Chemical and petroleum products
Former Soviet Union countries	Mineral and metal products
High Income Asian Countries	Transport equipment
Rest of European Free Trade Area	Electronic equipment
Rest of Asia	Other industries
Rest of Latin America	Trade services
Turkey, Middle-East and North Africa	Transport services
Rest of the World	Business and financial services
	Other private services
	Utilities and public services

Table 2.1: Structure of the EBA Region Economy in 2001 and 2014
(2001 US\$ Millions)

2001	Value of Exports		Value of Imports		Output	Domestic Consumption	Self Sufficiency ¹
	Intra-EU	Extra-EU	Intra-EU	Extra-EU			
Crops	4,020	4,202	663	4,025	69,904	66,370	1.05
Sugar	399	153	60	637	10,411	10,556	0.99
Cattle and sheep	10	84	1	89	10,288	10,284	1.00
Other livestock	112	148	42	87	6,759	6,626	1.02
Raw milk	3	5	1	2	4,447	4,441	1.00
Beef & sheepmeat	12	47	57	227	3,641	3,865	0.94
Other meat products	25	153	292	313	4,838	5,265	0.92
Dairy products	10	29	637	419	1,741	2,759	0.63
Beverages and tobacco	54	168	905	1,082	20,019	21,784	0.92
Other processed food products	2,113	1,992	1,941	5,512	41,588	44,936	0.93
Other primary products	6,998	22,207	75	1,868	63,675	36,413	1.75
Textiles, leather and clothing	7,625	12,015	1,080	9,410	49,174	40,024	1.23
Chemical & petroleum products	518	1,981	5,657	12,996	27,520	43,674	0.63
Mineral & metal products	2,259	2,209	2,993	7,458	27,571	33,554	0.82
Transport equipment	862	601	4,580	8,265	11,870	23,253	0.51
Electronic equipment	116	162	1,793	2,518	4,016	8,049	0.50
Other industries	3,475	1,823	8,847	11,600	34,414	49,563	0.69
Trade services	565	683	1,110	1,731	71,032	72,626	0.98
Transport services	1,894	3,277	1,727	2,722	48,873	48,150	1.02
Business & financial services	1,427	2,069	3,604	4,415	46,917	51,440	0.91
Other private services	248	365	578	665	90,487	91,116	0.99
Utilities & public services	807	2,838	848	2,261	72,446	71,909	1.01

2014	Value of Exports		Value of Imports		Output	Domestic Consumption	Self Sufficiency ¹
	Intra-EU	Extra-EU	Intra-EU	Extra-EU			
Crops	5,528	4,389	819	7,715	104,676	103,293	1.01
Sugar	3,976	217	72	1,120	21,429	18,428	1.16
Cattle and sheep	24	180	1	181	18,325	18,302	1.00
Other livestock	104	135	67	175	11,626	11,628	1.00
Raw milk	0	0	1	13	7,532	7,546	1.00
Beef & sheepmeat	44	130	34	405	6,876	7,142	0.96
Other meat products	38	213	418	985	8,570	9,721	0.88
Dairy products	25	37	817	1,325	2,943	5,023	0.59
Beverages and tobacco	68	252	1,483	1,856	34,126	37,145	0.92
Other processed food products	1,900	2,286	3,272	10,234	62,999	72,318	0.87
Other primary products	2,269	13,296	301	2,397	97,452	84,584	1.15
Textiles, leather and clothing	8,673	12,519	1,059	17,254	69,662	66,783	1.04
Chemical & petroleum products	499	2,986	13,400	20,693	46,974	77,582	0.61
Mineral & metal products	4,079	4,475	4,530	13,611	50,776	60,364	0.84
Transport equipment	2,842	1,797	5,464	13,104	26,994	40,924	0.66
Electronic equipment	431	702	1,517	4,336	9,456	14,175	0.67
Other industries	7,648	3,479	9,811	22,010	66,633	87,328	0.76
Trade services	1,016	1,547	1,496	2,606	128,538	130,077	0.99
Transport services	3,722	6,657	2,434	4,399	94,181	90,635	1.04
Business & financial services	2,690	4,304	5,078	7,114	90,656	95,854	0.95
Other private services	398	607	907	1,120	155,924	156,946	0.99
Utilities & public services	1,709	6,120	1,246	3,944	151,863	149,224	1.02

Note 1: Self-sufficiency calculated as sum of value of domestic production divided by value of domestic consumption.

Source: GTAP Version 6.0 database.

Table 2.2: Change in the EBA Region Economy in 2001-2014 – Sectoral Changes

2001 - 2014	Change in Exports		Change in Imports		Change in Output		Change in Domestic Consumption		Change in Trade Balance (\$M)	Change in Self-Sufficiency
	\$M	%	\$M	%	\$M	%	\$M	%		
Crops	1,695	21	3,847	82	34,772	50	36,923	56	-2,152	-0.04
Sugar	3,640	659	494	71	11,018	106	7,871	75	3,147	0.18
Cattle and sheep	110	118	91	101	8,037	78	8,018	78	19	0.00
Other livestock	-22	-8	113	89	4,867	72	5,002	75	-135	-0.02
Raw milk	-8	-92	12	573	3,085	69	3,105	70	-20	0.00
Beef & sheepmeat	115	194	156	55	3,235	89	3,276	85	-41	0.02
Other meat products	72	41	798	132	3,731	77	4,457	85	-725	-0.04
Dairy products	23	60	1,085	103	1,202	69	2,264	82	-1,062	-0.05
Beverages and tobacco	97	44	1,351	68	14,107	70	15,361	71	-1,253	0.00
Other processed food products	82	2	6,052	81	21,411	51	27,382	61	-5,971	-0.05
Other primary products	-13,640	-47	754	39	33,777	53	48,171	132	-14,395	-0.60
Textiles, leather and clothing	1,552	8	7,823	75	20,488	42	26,759	67	-6,271	-0.19
Chemical & petroleum products	986	39	15,441	83	19,454	71	33,908	78	-14,454	-0.02
Mineral & metal products	4,085	91	7,690	74	23,205	84	26,810	80	-3,605	0.02
Transport equipment	3,176	217	5,724	45	15,124	127	17,671	76	-2,547	0.15
Electronic equipment	854	307	1,541	36	5,440	135	6,126	76	-687	0.17
Other industries	5,829	110	11,374	56	32,219	94	37,764	76	-5,545	0.07
Trade services	1,315	105	1,261	44	57,506	81	57,452	79	55	0.01
Transport services	5,208	101	2,384	54	45,308	93	42,485	88	2,823	0.02
Business & financial services	3,498	100	4,174	52	43,739	93	44,414	86	-676	0.03
Other private services	391	64	783	63	65,438	72	65,830	72	-392	0.00
Utilities & public services	4,184	115	2,081	67	79,417	110	77,315	108	2,102	0.01

Source: GTAP model simulation results.

Table 2.3: Applied Trade Protection for EBA Region Economy in 2001 and 2014

(Trade-weighted Averages in %)

2001	EU Trade		All Trade	
	Average Import Protection	Average Export Protection	Average Import Protection	Average Export Protection
Crops	17.9	3.5	9.9	8.7
Sugar	22.1	79.0	20.7	60.5
Cattle and sheep	7.8	0.4	14.1	11.3
Other livestock	25.4	0.5	15.3	1.8
Raw milk	0.0	0.0	0.0	0.0
Beef & sheepmeat	13.6	3.1	12.7	2.8
Other meat products	29.6	6.1	22.1	40.2
Dairy products	13.6	9.4	15.0	13.2
Beverages and tobacco	47.8	2.0	44.2	19.2
Other processed food products	26.7	0.7	24.7	4.4
Other primary products	9.5	0.0	12.6	0.4
Textiles, leather and clothing	27.8	0.9	23.6	7.1
Chemical & petroleum products	16.0	0.1	13.7	6.9
Mineral & metal products	20.5	0.3	16.0	2.9
Transport equipment	15.1	1.0	17.1	2.6
Electronic equipment	12.8	0.2	11.9	2.9
Other industries	16.6	0.1	13.3	2.1
Trade services	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	0.0	0.0
Business & financial services	0.0	0.0	0.0	0.0
Other private services	0.0	0.0	0.0	0.0
Utilities & public services	0.0	0.0	0.1	0.1

2014	EU Trade		All Trade	
	Average Import Protection	Average Export Protection	Average Import Protection	Average Export Protection
Crops	9.1	0.0	9.5	5.9
Sugar	21.9	0.0	20.9	0.7
Cattle and sheep	6.1	0.0	14.1	11.3
Other livestock	23.5	0.0	14.9	2.2
Raw milk	0.0	0.0	0.0	0.0
Beef & sheepmeat	10.2	0.0	16.2	2.1
Other meat products	24.0	0.0	21.6	39.1
Dairy products	13.6	0.0	15.7	8.7
Beverages and tobacco	47.3	0.0	44.5	21.0
Other processed food products	23.0	0.0	24.6	4.9
Other primary products	7.4	0.0	11.5	1.8
Textiles, leather and clothing	24.3	0.0	24.8	6.6
Chemical & petroleum products	14.3	0.0	14.1	8.2
Mineral & metal products	18.0	0.0	16.4	3.0
Transport equipment	13.1	0.0	17.7	1.6
Electronic equipment	10.9	0.0	12.9	3.2
Other industries	13.6	0.0	13.4	2.1

Trade services	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	0.0	0.0
Business & financial services	0.0	0.0	0.0	0.0
Other private services	0.0	0.0	0.0	0.0
Utilities & public services	0.0	0.0	0.0	0.0

Source: GTAP Version 6.0 database and model simulation results.

Table 3.1: Structure of the Rest of ACP Region Economy in 2001 and 2014
(2001 US\$ Millions)

2001	Value of Exports		Value of Imports		Output	Domestic Consumption	Self Sufficiency ¹
	Intra-EU	Extra-EU	Intra-EU	Extra-EU			
Crops	2,010	2,610	136	1,544	11,565	8,626	1.34
Sugar	97	1,133	2	66	2,688	1,526	1.76
Cattle and sheep	5	44	2	47	2,224	2,223	1.00
Other livestock	21	46	6	62	1,834	1,836	1.00
Raw milk	1	1	0	1	1,293	1,292	1.00
Beef & sheepmeat	79	164	12	166	2,775	2,710	1.02
Other meat products	24	46	52	265	2,135	2,383	0.90
Dairy products	23	97	140	444	2,380	2,843	0.84
Beverages and tobacco	143	289	289	326	4,383	4,566	0.96
Other processed food products	402	1,516	285	2,241	9,793	10,402	0.94
Other primary products	82	298	26	2,509	3,439	5,594	0.61
Textiles, leather and clothing	260	7,455	349	7,368	14,535	14,538	1.00
Chemical & petroleum products	394	2,998	1,421	7,646	11,406	17,080	0.67
Mineral & metal products	368	1,671	887	3,333	8,055	10,235	0.79
Transport equipment	658	844	1,851	10,375	3,418	14,141	0.24
Electronic equipment	488	1,344	495	2,699	2,630	3,992	0.66
Other industries	2,791	2,413	2,525	7,325	13,101	17,747	0.74
Trade services	347	438	235	630	21,868	21,947	1.00
Transport services	1,680	2,511	520	927	15,550	12,806	1.21
Business & financial services	813	1,254	929	1,218	17,336	17,415	1.00
Other private services	246	346	232	276	25,231	25,148	1.00
Utilities & public services	494	903	238	876	32,992	32,710	1.01

2014	Value of Exports		Value of Imports		Output	Domestic Consumption	Self Sufficiency ¹
	Intra-EU	Extra-EU	Intra-EU	Extra-EU			
Crops	3,203	3,589	127	2,259	16,759	12,353	1.36
Sugar	88	1,700	1	94	3,921	2,228	1.76
Cattle and sheep	11	73	1	73	3,086	3,076	1.00
Other livestock	30	59	7	97	2,507	2,522	0.99
Raw milk	4	1	0	1	1,834	1,829	1.00
Beef & sheepmeat	110	163	9	290	3,766	3,792	0.99
Other meat products	27	43	45	587	2,773	3,335	0.83
Dairy products	74	209	88	660	3,901	4,368	0.89
Beverages and tobacco	197	430	379	463	6,553	6,767	0.97
Other processed food products	527	1,955	358	3,347	13,645	14,868	0.92
Other primary products	32	346	42	2,176	5,020	6,860	0.73
Textiles, leather and clothing	221	7,243	332	9,656	17,449	19,974	0.87
Chemical & petroleum products	322	3,275	2,519	11,813	14,645	25,381	0.58
Mineral & metal products	615	2,893	1,304	5,129	13,521	16,446	0.82
Transport equipment	1,175	1,546	2,761	15,471	6,234	21,745	0.29
Electronic equipment	816	2,567	394	4,250	5,203	6,464	0.80
Other industries	5,961	4,375	2,846	10,932	24,152	27,593	0.88
Trade services	540	821	320	830	34,912	34,701	1.01
Transport services	3,093	4,814	645	1,328	26,712	20,778	1.29
Business & financial services	1,531	2,613	1,108	1,666	29,771	28,400	1.05
Other private services	470	688	284	362	39,100	38,588	1.01
Utilities & public services	1,209	2,199	243	1,150	55,732	53,718	1.04

Note 1: Self-sufficiency calculated as sum of value of domestic production divided by value of domestic consumption.

Source: GTAP Version 6.0 database.

Table 3.2: Change in the Rest of ACP Region Economy in 2001-2014 – Sectoral Changes

2001 - 2014	Change in Exports		Change in Imports		Change in Output		Change in Domestic Consumption		Change in Trade Balance (\$M)	Change in Self-Sufficiency
	\$M	%	\$M	%	\$M	%	\$M	%		
Crops	2,173	47	706	42	5,194	45	3,727	43	1,467	0.02
Sugar	558	45	27	40	1,233	46	702	46	531	0.00
Cattle and sheep	35	70	25	51	862	39	852	38	10	0.00
Other livestock	22	34	35	52	673	37	686	37	-13	0.00
Raw milk	3	131	0	50	541	42	538	42	3	0.00
Beef & sheepmeat	30	12	121	68	990	36	1,081	40	-91	-0.03
Other meat products	0	0	314	99	638	30	952	40	-314	-0.06
Dairy products	162	136	165	28	1,522	64	1,524	54	-3	0.06
Beverages and tobacco	195	45	227	37	2,170	50	2,202	48	-32	0.01
Other processed food products	565	29	1,179	47	3,852	39	4,466	43	-614	-0.02
Other primary products	-3	-1	-318	-13	1,581	46	1,266	23	315	0.12
Textiles, leather and clothing	-251	-3	2,271	29	2,914	20	5,436	37	-2,522	-0.13
Chemical & petroleum products	204	6	5,266	58	3,240	28	8,301	49	-5,061	-0.09
Mineral & metal products	1,469	72	2,214	52	5,466	68	6,211	61	-745	0.04
Transport equipment	1,219	81	6,006	49	2,816	82	7,603	54	-4,787	0.05
Electronic equipment	1,551	85	1,449	45	2,573	98	2,471	62	101	0.15
Other industries	5,133	99	3,927	40	11,051	84	9,846	55	1,205	0.14
Trade services	576	73	286	33	13,044	60	12,754	58	290	0.01
Transport services	3,717	89	526	36	11,162	72	7,972	62	3,191	0.07
Business & financial services	2,078	101	627	29	12,435	72	10,984	63	1,451	0.05
Other private services	567	96	137	27	13,869	55	13,440	53	429	0.01
Utilities & public services	2,011	144	279	25	22,740	69	21,008	64	1,732	0.03

Source: GTAP model simulation results.

Table 3.3: Applied Trade Protection for Rest of ACP Region in 2001 and 2014

(Trade-weighted Averages in %)

2001	EU Trade		All Trade	
	Average Import Protection	Average Export Protection	Average Import Protection	Average Export Protection
Crops	49.7	19.8	6.1	10.6
Sugar	72.0	118.7	24.4	36.3
Cattle and sheep	3.6	0.0	0.5	0.9
Other livestock	24.4	0.7	3.1	1.5
Raw milk	0.0	0.0	0.0	0.0
Beef & sheepmeat	47.2	73.4	5.5	33.1
Other meat products	48.2	6.4	13.5	6.2
Dairy products	23.4	5.8	15.7	7.7
Beverages and tobacco	27.2	8.7	19.8	8.8
Other processed food products	32.7	5.8	7.9	3.5
Other primary products	5.2	0.4	0.3	1.8
Textiles, leather and clothing	162.6	1.2	13.8	11.4
Chemical & petroleum products	11.5	0.2	4.2	2.5
Mineral & metal products	10.3	0.1	5.4	1.9
Transport equipment	9.4	1.0	10.5	2.1
Electronic equipment	9.7	0.1	4.7	1.8
Other industries	12.8	0.0	5.8	1.3
Trade services	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	0.0	0.0
Business & financial services	0.0	0.0	0.0	0.0
Other private services	0.0	0.0	0.0	0.0
Utilities & public services	0.0	0.0	0.0	0.0

2014	EU Trade		All Trade	
	Average Import Protection	Average Export Protection	Average Import Protection	Average Export Protection
Crops	3.5	20.2	6.1	11.2
Sugar	13.1	117.1	24.6	33.5
Cattle and sheep	3.2	0.0	0.4	1.1
Other livestock	4.9	0.8	3.3	1.8
Raw milk	0.0	0.0	0.0	0.0
Beef & sheepmeat	7.3	73.9	6.1	37.9
Other meat products	14.0	6.8	14.1	6.0
Dairy products	20.3	5.7	15.3	7.3
Beverages and tobacco	25.1	8.7	19.7	9.5
Other processed food products	9.6	5.7	8.0	3.8
Other primary products	2.0	0.7	0.3	2.6
Textiles, leather and clothing	14.9	1.4	13.5	11.5
Chemical & petroleum products	5.8	0.4	4.3	2.8
Mineral & metal products	8.2	0.3	5.5	2.0
Transport equipment	7.9	1.2	10.3	2.0
Electronic equipment	6.9	0.9	6.0	2.4
Other industries	7.6	0.1	6.0	1.4

Trade services	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	0.0	0.0
Business & financial services	0.0	0.0	0.0	0.0
Other private services	0.0	0.0	0.0	0.0
Utilities & public services	0.0	0.0	0.0	0.0

Source: GTAP Version 6.0 database and model simulation results.

Table 4: Decomposition of Welfare Effects of Simulations
(2001 US\$ Millions)

Region	Total	% of GDP	Domestic Support Reduction EU & USA	Domestic Support Reduction Rest of World	Tariff Reduction IC	Tariff Reduction DC	Export Subsidy Abolished	EU Budgetary Effect
Ireland	-44	-0.03	2	1	90	19	34	-190
UK	1,725	0.10	29	14	1,341	54	-50	338
Germany	607	0.03	60	11	237	29	218	50
France	405	0.03	9	3	290	22	308	-227
Rest EU15	2,335	0.06	52	19	1,668	-93	841	-152
CEEC	41	0.01	-42	-3	-258	-8	170	181
USA	2,986	0.03	20	-48	1,670	1,211	133	-
Canada	818	0.10	-37	8	653	182	12	-
China	-558	-0.03	-1	18	-264	-290	-21	-
India	159	0.02	-9	1	42	111	14	-
EBA	-504	-0.08	3	3	-347	77	-239	-
Mercosur	1,816	0.18	-34	-15	1,257	501	106	-
Rest ACP	582	0.40	-5	-4	581	8	3	-
Former Soviet Union	268	0.04	56	2	271	163	-224	-
High Income Asian	5,611	0.09	149	-3	5,928	-267	-195	-
Rest EFTA	1,089	0.20	20	7	944	125	-8	-
Rest Asia	403	0.06	0	4	212	273	-87	-
Rest Latin America	-52	0.00	43	11	88	-17	-177	-
Mediterranean	-133	-0.01	70	36	221	321	-782	-
Rest of World	1,237	0.15	-85	-18	712	393	235	-
Total	18,794	0.05	303	48	15,338	2,815	291	0

Source: GTAP model simulation results.

Table 5: Distribution of Global Welfare Change (%)

Liberalising Region	Benefiting Region	Domestic Support	Tariffs and Export Subsidies	Total
IC	<i>IC</i>	1.7	74.9	76.6
	<i>DC</i>	-0.1	8.3	8.2
	<i>Total</i>	1.6	83.2	84.8
DC	<i>IC</i>	0.1	7.6	7.7
	<i>DC</i>	0.2	7.3	7.5
	<i>Total</i>	0.3	15.0	15.2
All Regions	<i>IC</i>	1.8	82.5	84.3
	<i>DC</i>	0.1	15.6	15.7
	<i>Total</i>	1.9	98.1	100.0

Source: GTAP model simulation results.

Table 6: Welfare Decomposition for EBA and Rest of ACP Regions

(2001 US\$ Millions)	EBA Region	Rest of ACP Region
Allocative Efficiency Effects	-118	113
Terms of Trade Effects	-391	415
Investment and Savings Price Effect	6	55
Total Welfare Gain	-504	582

Source: GTAP model simulation results.

**Table 7: Welfare Decomposition for EBA and Rest of ACP Regions
Tariff Liberalisation Only**

EBA Region	(US\$ Millions)
Reduction of tariffs on agricultural goods from EU to EBA Countries	0
Reduction of tariffs on agricultural goods from Third Countries to EBA Countries	0
Reduction of tariffs on agricultural goods from EBA Countries to EU	0
Reduction of tariffs on agricultural goods from EBA Countries to Third Countries	228
Reduction of tariffs on agricultural goods from EBA Countries to EBA Countries	0
Reduction of tariffs on agricultural goods from EU to Third Countries	-442
Reduction of tariffs on agricultural goods from Third Countries to EU	22
Reduction of tariffs on agricultural goods from Third Countries to Third Countries	-78
Total	-270
Rest of ACP Region	(US\$ Millions)
Reduction of tariffs on agricultural goods from EU to Rest of ACP	0
Reduction of tariffs on agricultural goods from Third Countries to Rest of ACP	-33
Reduction of tariffs on agricultural goods from Rest of ACP to EU	727

Reduction of tariffs on agricultural goods from Rest of ACP to Third Countries	305
Reduction of tariffs on agricultural goods from Rest of ACP to Rest of ACP	11
Reduction of tariffs on agricultural goods from EU to Third Countries	-142
Reduction of tariffs on agricultural goods from Third Countries to EU	-16
Reduction of tariffs on agricultural goods from Third Countries to Third Countries	-264
Total	588

Source: GTAP model simulation results.

Table 8: Changes in Exports for EBA and Rest of ACP Regions

Sector	EBA		Rest of ACP	
	%	\$Millions	%	\$Millions
Crops	-0.9	-119	4.3	371
Sugar	-29.5	-1,131	23.2	377
Cattle and sheep	4.9	11	-3.4	-3
Other livestock	-2.4	-9	-7.0	-8
Raw milk	-28.1	-1	-41.2	-3
Beef & sheepmeat	-5.9	-9	102.2	288
Other meat products	6.7	18	-14.4	-11
Dairy products	5.1	3	-1.5	-4
Beverages and tobacco	0.0	0	-2.2	-12
Other processed food products	-0.6	-27	-4.7	-110
Other primary products	0.2	112	0.9	14
Textiles, leather and clothing	0.8	151	-3.6	-226
Chemical & petroleum products	0.6	21	-0.9	-34
Mineral & metal products	1.3	96	-1.6	-49
Transport equipment	1.6	58	-1.0	-22
Electronic equipment	2.5	23	-2.1	-63
Other industries	1.5	138	-2.8	-246
Trade services	1.0	22	-2.1	-24
Transport services	1.1	112	-1.2	-88
Business & financial services	1.3	74	-1.6	-54
Other private services	1.0	9	-1.4	-13
Utilities & public services	1.4	89	-1.6	-44

Source: GTAP model simulation results.

Table 9: Percentage Changes in Wages

Region	Unskilled	Skilled
Ireland	0.28	0.41
UK	0.21	0.23
Germany	0.22	0.24
France	0.29	0.34
Rest EU15	0.23	0.29
CEEC	0.68	0.83
USA	0.02	-0.01
Canada	0.10	0.09
China	0.25	0.26
India	0.40	0.42
EBA	-0.20	-0.09
Mercosur	-0.23	-0.24
Rest ACP	-0.03	-0.11
Former Soviet Union	0.14	0.16
High Income Asian	0.48	0.57
Rest EFTA	0.48	0.53
Rest Asia	0.29	0.25
Rest Latin America	-0.02	-0.08
Mediterranean	0.11	0.11

Rest of World	0.14	0.10
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Note: Change in wages measured as the change in ratio of return of skilled or unskilled labour to CPI in each region (variable *pfactreal*).

Source: GTAP model simulation results.

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Institute for International Integration Studies

The Sutherland Centre, Trinity College Dublin, Dublin 2, Ireland

