Impacts of the EU sugar policy reforms on developing countries

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Project code 20334

June 2005

Report 6.05.09

Agricultural Economics Research Institute (LEI), The Hague

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Berkum, S. van, P. Roza, and F.W. van Tongeren
The Hague, Agricultural Economics Research Institute (LEI), 2005
Report 6.05.09; ISBN 90-8615-000-4; Price € 20.- (including 6% VAT)
101 pp., fig., tab., app.

This report analyses the impacts of the Commission's July 2004 proposal for sugar policy reforms on developing countries. The study uses three approaches that complement each other: model simulations, literature review and country case studies. Model simulations indicate that the consequences of the EU policy reform on EU imports are rather modest: imports from LDCs increase but to a lesser extent than the Commission and other studies indicate. Important trigger points in the evaluation of the impact on trade flows are the degree of substitutability between domestic EU sugar and imported sugar, and potential 'swap' or trade diversion effects. Welfare effects are minor to ACP countries as a group, but country effects may differ strongly. The study includes three case studies - Ethiopia, Mauritius and Brazil, representing an EBA, an ACP and a net exporting country with no preferences to the EU market - to show how EU policy changes may affect the sugar industry in each of these countries.

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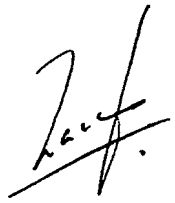
Preface

In July 2004 the Commission proposed the outline of the future sugar regime in the European Union. The proposal includes a significant reduction of the internal prices and production quota. Developing countries' export opportunities are affected by such a policy change. With high support prices maintained beyond 2006, the group of Less Developed Countries (LDCs) and African, Caribbean and Pacific (ACP) countries would benefit from the present preferential trade agreements, as they can export to the EU against the high internal prices. When the internal EU prices are reduced to levels the Commission proposed in its July 2004 document, only the most competitive LDC/ACP producers would be able to maintain access to the EU market.

The Ministry of Agriculture, Nature and Food Quality in the Netherlands has requested LEI to assess the potential impacts of the reform proposal on EU imports and on the export opportunities for developing countries. As many of the existing analyses, including those of the Commission, are mainly based on static and sector analyses, this study aims to improve insights into the potential impact of EU policy changes on developing countries by taking into account dynamic sector and macroeconomic adjustment effects.

Siemen van Berkum, Pim Roza and Frank van Tongeren carried out the research. The research was supervised by a steering committee with the following staff members of the Ministry of Agriculture, Nature and Food Quality: A. van Poppel (chair), G. Meester, R. Huige, A. Vermüe, M. Woldberg and J. Rummenie. LEI would like to sincerely thank the steering committee members for their generous contribution.



Prof. Dr. L.C. Zachariasse
Director General LEI B.V.

Samenvatting

Doel en aanpak
Het doel van deze studie is om een analyse te maken van de gevolgen van het voorstel van juli 2004 van de Europese Commissie ten aanzien van de hervorming van het EU-suikerbeleid voor de EU-invoer uit en exportmogelijkheden van ontwikkelingslanden. De onderzoeksvragen laten zich als volgt samenvatten:

- Wat zijn de gevolgen van de Europese beleidsveranderingen voor de in- en uitvoer van suiker door de EU?
- Wat zijn de gevolgen voor de suikerexport en het nationaal inkomen van (groepen van en enkele geselecteerde) ontwikkelingslanden?

De studie hanteert drie benaderingen die elkaar aanvullen. Als eerste methode gebruiken we modelsimulaties om de gevolgen te schetsen van verschillende beleidsscenario's voor de handelsstromen tussen de EU en diverse groepen ontwikkelingslanden. Vervolgens trachten we de onderzoeksvragen te beantwoorden aan de hand van een kritische bespreking van relevante literatuur. En ten derde presenteren we drie landenstudies.

Kenmerken van de internationale suikermarkt
De suikerproductie in de wereld neemt gestaag toe. Deze groei doet zich hoofdzakelijk voor in de (meer ontwikkelde) ontwikkelingslanden, zoals Brazilië, India, Thailand en Mexico. Op dit moment is Brazilië veruit de belangrijkste exporteur van suiker, gevolgd door de EU, Thailand en Australië. Sedert het begin van de jaren negentig loopt het aandeel van de EU in de internationale suikerhandel terug, terwijl het volume van de wereldhandel wel is toegenomen. Internationale prijzen schommelen, met lange perioden van relatief lage prijzen. Dit is terug te voeren op een aantal basiskenmerken van het gewas en zijn verwerking, waardoor de suikerproductie zich niet soepel aan veranderende marktomstandigheden aanpast. Ook nationaal overheidsbeleid beïnvloedt de internationale suikerhandel en internationale prijzen. Overheidssteun aan de sector is niet beperkt tot alleen de OESO-landen; ook in Rusland, China, India en andere ontwikkelingslanden wordt de binnenlandse suikermarkt gereguleerd.

Gevolgen EU-voorstel per ontwikkelingsland verschillend
De EU verleent diverse landen preferentiële toegang tot de Europese markt. Hiervan is de groep van ondertekenaars van het ACP Suiker Protocol de belangrijkste. Deze voormalige koloniën van EU-lidstaten profiteren van markttoegang tot de Unie waarbij zij voor een quotum van 1,5 miljoen ton ruwe suiker EU-prijzen kunnen ontvangen. Het hervormingsvoorstel van de Commissie van juli 2004 betekent voor deze groep een verlies van exportopbrengsten uit de handel met de Unie. De gevolgen van dit voorstel verschillen echter per land om drie redenen. Ten eerste zijn de huidige voordelen van het EU-beleid

nogal ongelijk verdeeld tussen de betrokken landen; landen die er het meest van profiteren zullen waarschijnlijk de grootste verliezen aan exportopbrengsten hebben. Ten tweede verschillen de productiekosten in de landen sterk. Sommige landen met relatief lage productiekosten zullen in staat zijn om ook in de nieuwe situatie hun export naar de EU voort te zetten of zelfs uit te breiden, en/of additionele markten in derde landen te vinden als de EU zich verder terugtrekt van de internationale markt. Ten derde, de gevolgen voor de landen verschillen omdat per land mogelijkheden voor economische diversificatie verschillen.

Gevolgen van EU-hervorming volgens modelsimulaties

Om de gevolgen van de beleidsherziening van de EU voor ontwikkelingslanden te berekenen, hebben we twee modelsimulaties uitgevoerd. Het eerste scenario is de toepassing van de EBA-regeling, waarbij vrije toegang tot de EU-markt aan EBA-landen wordt verleend en het huidige EU-suikerbeleid wordt voortgezet. Het tweede scenario is het Commissievoorstel van juli 2004. De belangrijkste conclusies van deze simulaties zijn:

- De invoer van suiker vanuit EBA-landen neemt toe, maar de toename is niet bijzonder groot. De extra invoer in het EBA-scenario is 384.000 ton ruw suiker, waardoor de totale invoer van de EU-27 zou uitkomen op 2,9 miljoen ton. In het hervormingsscenario (en dus bij lagere EU-prijzen) neemt de invoer toe met 'slechts' 211.000 ton. Deze invoertoename is veel lager dan de eigen inschatting van de Europese Commissie. De Commissie stelt namelijk dat bij onveranderd EU-beleid en vrije toegang voor de minst-ontwikkelde landen de invoer uit deze landen met zo'n 2,8 miljoen ton zal toenemen (tot rond 3,0 miljoen ton) waardoor de totale invoer van de Unie zou verdubbelen. Als het EU-beleid wordt herzien, zal de extra invoer uit EBA-landen volgens de Commissie zo'n 0,5 miljoen ton bedragen;
- EBA-landen behalen positieve welvaartsgevolgen als de handelsbarrières voor suiker wegvallen; zij kunnen immers meer suiker naar de EU exporteren. De grootste effecten treden echter op bij het verdwijnen van handelsbarrières voor andere (niet-suiker) sectoren. Het nationaal inkomen van deze groep landen neemt naar schatting met USD382 miljoen toe onder het scenario van de EU-hervorming. Dit bedrag is gelijk aan 0,1% van het gezamenlijke inkomen in 2001;
- ACP-landen die het Suiker Protocol hebben ondertekend, zijn in staat om het verlies aan exportopbrengsten uit de handel met de EU te compenseren: deze landen zien (als groep) een bescheiden groei van hun suikerexport onder het scenario van de Europese suikerhervorming, omdat deze landen iets meer kunnen uitvoeren naar andere ontwikkelingslanden. Dit leidt echter niet tot een groei van het gezamenlijke nationaal inkomen omdat de gemiddelde prijs voor hun suikeruitvoer afneemt en men geen welvaartswinst boekt in andere sectoren;
- Brazilië en een groep 'andere ontwikkelingslanden' zien hun export (vooral naar 'andere ontwikkelingslanden') iets toenemen, maar de groei in volume is bescheiden. Zowel voor Brazilië als voor de groep 'andere ontwikkelingslanden' heeft het EU-voorstel tot wijziging van de suikermarktordening nauwelijks gevolgen.

Suiker een (im)perfect substituut?
De relatief bescheiden invoerstroom vanuit de minst ontwikkelde landen naar de EU heeft sterk te maken met de aanname dat suiker uit de EU en uit de minst ontwikkelde landen als imperfecte substituten worden beschouwd. Als we deze veronderstelling laten varen en suiker als een homogeen product (een perfect substituut) beschouwen, komen we uit op veel grotere invoerstromen: onder het EBA-scenario zullen de EBA-landen een extra 2,7 miljoen ton suiker exporteren naar de EU, terwijl dat in het geval van de EU-hervorming zo'n 0,9 miljoen ton zal omvatten. Diverse studies over dit onderwerp nemen aan dat suiker een homogeen product is, maar dat is om drie redenen niet erg plausibel. Ten eerste ondersteunen econometrische studies gebaseerd op lange termijn historische trends deze veronderstelling niet. Ten tweede, veel industriële gebruikers van suiker in de EU eisen een hoge kwaliteit geraffineerde suiker, iets wat maar enkele ontwikkelingslanden kunnen aanbieden. En ten derde, in de internationale handel is er het verschil tussen ruwe suiker en witte suiker. Het lijkt daarom veel realistischer suiker uit de EU en uit de minst ontwikkelde landen als imperfecte substituten te beschouwen.

Uitkomsten van andere studies
Andere studies, zoals die van LMC, wijzen uit dat bij een sterke prijsverlaging in de EU de productiekosten in veel ACP- en EBA-landen te hoog zullen zijn om suiker te kunnen exporteren naar de EU. Dat geldt vooral voor de suikerindustrie in het Caribisch gebied. Daar staat tegenover dat sommige ACP Suiker Protocol (SP-)landen (zoals Malawi, Swaziland, Zambia en Zimbabwe) zo goedkoop suiker kunnen produceren dat zij in staat lijken te zijn hun productie en de uitvoer naar de EU uit te breiden. Daarbij kunnen zij ACP SP quota overnemen van landen die dat niet kunnen vullen bij de lage EU-prijzen van na de hervorming. Om de productie-uitbreiding te realiseren zal in deze landen behoorlijk geïnvesteerd moeten worden in de rietsuikersector. Met uitzondering van Zimbabwe lijken echter de productiekosten in genoemde landen niet laag genoeg te zijn om bij de nu voorgestelde lage EU-prijzen die investeringen in productie-uitbreiding rendabel te maken. Het staat dus nog maar te bezien of goedkoop producerende ACP-landen het hele ACP SP quotum zullen kunnen blijven leveren. Naast goedkoop producerende ACP SP landen maken een aantal efficiënt producerende EBA-landen een grote kans maken om suiker te exporteren naar de Unie. Het gaat dan om landen als Ethiopië, Soedan en Mozambique. Deze landen kunnen volgens LMC in 2015 mogelijk tussen de 0,6 en 1 miljoen ton suiker naar de Unie exporteren als in deze landen wordt geïnvesteerd in de suikerindustrie. Investeringen in deze landen (met name Soedan en Mozambique) worden momenteel evenwel gehinderd door politieke instabiliteit. Bovendien heeft de Europese Commissie al aangegeven in 2008 het EBA-akkoord te willen evalueren en mogelijk haar beleid bij te stellen. Zo'n aankondiging betekent onzekerheid ten aanzien van het beleid op middellange termijn, waardoor het bedrijfsleven terughoudend is met het doen van investeringen in de sector.

Arbitrage of driehoekshandel
Alhoewel de directe effecten van de EU-beleidshervorming op de invoer van de Unie bescheiden is, is er veel onzekerheid rond de mogelijkheid van arbitrage, ofwel de mogelijkheid dat een EBA-land zijn (hele) productie verkoopt aan de EU en goedkopere suiker voor eigen gebruik importeert. Zoiets kan zich voordoen als het verschil tussen de

EU-prijs aan de ene kant en de import(wereldmarkt)prijs plus transport-/transactiekosten aan de andere kant gunstig uitvalt voor het EBA-land. Bij het huidige prijsniveau op de internationale suikermarkt kan arbitrage aantrekkelijk zijn, ook bij een EU-prijs van 329 euro/ton ruwe suiker. De mogelijke omvang van arbitrage is zeer moeilijk in te schatten. Onze eigen modelsimulaties geven aan dat arbitrage beperkt zal blijven. Dat komt omdat de huidige bescherming aan de grens van veel EBA-landen geen goedkope invoer van suiker van de wereldmarkt toelaat en wij in onze berekeningen aannemen dat deze situatie zo blijft. Er bestaat echter wel degelijk de kans dat EBA-landen hun grensbescherming gaan verlagen om meer (goedkopere) suiker te kunnen importeren voor eigen gebruik en een groter deel van de eigen productie naar de Unie te exporteren. De EC komt met een inschatting dat als gevolg van arbitrage de extra importen na verloop van een aantal jaren kunnen oplopen tot 1,25 miljoen ton. LMC schat dat in een meest extreme situatie - als alle suikerproductie van EBA-landen naar de EU worden geëxporteerd - de invoer van de EU tussen de 4,7 en 6,2 miljoen ton kan liggen.

In de onderstaande tabel worden de gevolgen van de EBA-regeling voor de EU-invoer volgens de in deze studie besproken analyses samengevat. Volgens onze eigen analyse zijn de gevolgen voor de EU-invoer (veel) geringer dan de Europese Commissie en LMC inschatten.

Tabel 1 Additionele EU-invoer van ruwe suiker uit EBA-landen (in miljoen ton) a)

	EC	LEI	LMC
Status quo	2,8	0,4 (suiker is imperfect substituut) 2,7 (suiker is perfect substituut)	n.b.
EU-hervorming: 33% prijsdaling	0,5	0,2 (suiker is imperfect substituut) 0,9 (suiker als perfect substituut)	0,1 (korte termijn) 0,6-1,0 (middellange termijn)
EU-hervorming inclusief arbitrage-effect	0,5 (2008/0) + 0,75 (2013/4)	0,2 (suiker is imperfect substituut) 0,9 (suiker is perfect substituut)	4,6-6,2 (meest extreme situatie)

a) De ramingen van de EG voor EU-25, Ramingen LEI voor EU-27, Ramingen LMC voor (eenvoudig) de EU.

Landenstudie Ethiopië

Deze studie omvat ook drie case studies om inzicht te geven in enkele landenspecifieke gevolgen van de wijzigingen in het EU-beleid. De landenstudie over Ethiopië - een goedkope suikerproducent en een EBA-land - laat zien dat de overheid, als eigenaar van suikerplantages en -fabrieken, een aanzienlijke uitbreiding van de suikerproductie voor ogen heeft om daarmee zowel de groeiende binnenlandse vraag te kunnen bedienen als ook de exportkansen in de Europese markt te kunnen benutten. Ethiopische bronnen schatten dat het land binnen tien jaar zo'n 1 miljoen ton suiker zou kunnen exporteren. Deze omvang is tweemaal zo hoog als wat LMC mogelijk acht. De projecties zijn afhankelijk van de beschikbaarheid van investeringsmiddelen en van succesvolle marktpenetratie in de regio, waar Ethiopië sterke concurrentie ondervindt van andere goedkope producenten zoals Malawi, Soedan, Zambia en ook Brazilië.

Landenstudie Mauritius
De casestudie over Mauritius is een voorbeeld van een ACP SP-land waarin de suikersector van groot belang is voor 's land's agrarische economie en waar de industrie veel profijt heeft van de preferentiële toegang tot de Europese markt. De Europese beleidsveranderingen zouden grote negatieve gevolgen hebben voor de suikerindustrie in Mauritius, die tot aanzienlijke herstructurering van de industrie nopen. Mauritius is al geruime tijd bezig om de kwetsbaarheid van de agrarische sector te verminderen door andere teelten dan suikerriet te stimuleren. Voorts anticipeert het eiland al op de suikerbeleidshervorming in de EU door al enige jaren een herstructurering van de suikerindustrie door te voeren en te trachten deze efficiënter te maken. De comparatieve voordelen van het eiland lijken echter veeleer buiten de suikersector te liggen: omdat de kosten van suikerproductie relatief hoog zijn, lijkt het onwaarschijnlijk dat het eiland een belangrijke rol zal kunnen blijven spelen in de internationale suikerhandel als de profijtelijke handel met de EU verdwijnt.

Landenstudie Brazilië
Brazilië is 's werelds grootste en meest competitieve producent van suiker en ethanol, en is in de jaren negentig de grootste exporteur van beide producenten geworden. De wijziging in het EU-beleid geeft Brazilië waarschijnlijk de mogelijkheid tot verdere expansie op derde markten als de EU zich terugtrekt van exportmarkten. Verdere herstructurering en uitbreiding van de Braziliaanse suikerindustrie zal de concurrentiekracht van de industrie versterken. Schattingen van de toekomstige Braziliaanse suikerproductie (door onder andere de OESO en Cargill) voorspellen dat Brazilië in toenemende mate de internationale markt zal domineren.

Slotbeschouwing
De hervorming van het EU-suikerbeleid leidt tot verschuivingen in het systeem van handelspreferenties. Sommige landen verliezen, andere profiteren. De meeste analyses van de gevolgen van het EU-voorstel zijn alleen gericht op de directe effecten voor de suikersector, zonder voldoende aandacht voor aanpassingen in andere economische sectoren. Daardoor wordt niet een volledig beeld gegeven van de gevolgen van zo'n beleidsverandering: kapitaal en arbeid kunnen goedbetaalde alternatieve aanwendingen vinden en de betrokken economieën kunnen diversifiëren, waardoor eventuele negatieve gevolgen voor de suikersector kunnen worden opgevangen. De uitkomsten van onze modelsimulaties geven aan dat de inkomenseffecten van de voorgestelde wijzigingen in het EU-suikerregime niet nadelig zijn voor zowel de ACP- als de EBA-landen als groep. Zoals deze studie ook benadrukt, verschillen landen onmiskenbaar van elkaar en daarmee ook de gevolgen van de veranderingen in de handelspreferenties met de EU, zowel voor de suikersector als voor de hele economie. Wanneer de EU steun overweegt aan landen die stellen nadelen te zullen ondervinden van de veranderingen in het Europees suikerbeleid, zullen deze landenspecifieke situaties goed in beschouwing moeten worden genomen. Voor een compleet beeld van die landenspecifieke gevolgen zullen meer, en meer diepgravende landenstudies nodig zijn dan in het kader van deze studie mogelijk is geweest.

Summary

The features of the international market indicate that sugar production growth has occurred largely in (advanced) developing countries, like Brazil, India, Thailand and Mexico. Today, Brazil is by far the largest exporter of sugar, followed by the EU, Thailand and Australia. Over the last decade, the EU has lost shares at an international market where increasing volumes are traded. International prices are volatile with prolonged periods of low prices. This tendency is due to some basic features of the crop and its processing, which hinder sugar production to respond quickly to changing market conditions. Also government interventions in national markets affect international sugar trade and prices significantly. Such government support policies are not only utilised by OECD countries; also countries like Russia, China, India and other (developing) countries regulate their domestic industries.

The EU sugar trade regime provides preferential treatment to several groups of countries, of which the major one is the ACP Sugar Protocol signatories. This group of former colonies of EU Member States benefits from preferential access to EU markets where they receive high prices for their SP quota. The Commission's July 2004 reform proposal implies a loss in sugar export revenues for all those countries presently benefiting from these EU preferences. However, effects of this proposal differ among the present beneficiaries for at least three reasons. First, present benefits are highly unevenly distributed among the ACP countries and countries benefiting most will lose most in terms of export revenues. Second, countries differ greatly in terms of production costs. Some countries with relatively low production costs may be able to continue or even expand exports to the EU, others may find additional markets in third countries as the EU withdraws from the international market. Third, the impacts on the economies differ as countries' opportunities for economic diversification differ.

In order to estimate the impact of EU policy changes for developing countries we have done two model simulations: an EBA agreement (and a continuation of the present EU sugar policy) and the July 2004 Commission reform proposal. The major conclusions from these experiments are that:

- Sugar imports from EBA countries increase but there is no dramatic inflow of sugar under the two scenarios simulated. The extra EU imports under the EBA scenario will be 384,000 tonnes, resulting in total EU-27 imports of 2.9 million tonnes. In the EU reform scenario extra imports will add up to only 211,000 tonnes. These estimates are much lower than what the EC indicates in its background notes to the Communication of July 2004. As reported, the EC projects an import increase of around 2.8 million tonnes (from 0.2 million tonnes to around 3.0 million tonnes) from EBA under a status quo scenario, while extra imports from EBA countries would be 500,000 tonnes under the reform scenario;
- EBA countries achieve positive welfare effects from the elimination of sugar trade barriers, but mainly from the elimination of non-sugar trade barriers. National in-

come of these countries is estimated to increase USD382 million under the EU reform scenario;

- ACP SP countries are able to compensate for the loss of export revenues in the face of declining EU prices: these countries (as a group) will see a mild growth in their sugar export volumes under the July 2004 EU reform proposal, as these countries can export a bit more to other developing countries. However, this does not translate into income gains as prices received decline;
- Brazil and other developing countries will increase their exports to other developing countries but these amounts are modest. Both Brazil and the group of other developing countries are hardly affected by the EU proposal.

The relatively modest import flow of LDC sugar into the EU is related to the fact that EU sugar and LDC sugar are imperfect substitutes. If we leave that assumption and assume instead that sugar is a homogenous good (a perfect substitute), we obtain a dramatically higher rise in EBA exports towards the EU27: under the EBA scenario imports from EBA countries change by an additional 2.7 million tonnes, while under the EU reform scenario with perfect substitutability EBA sugar imports rise by 'only' 915,000 tonnes. The homogeneity assumption is maintained in most other modelling studies on the sugar market, but its not very plausible for three reasons. One, the econometric studies, based on long-term historical trends, do not support it. Two, dominant industrial users of sugar in the EU are likely to insist on high quality refined sugar, which only a few LDC suppliers are able to supply. And three, there is the difference between raw and white sugar in the international trade.

Other studies, like those of LMC, show that under a scenario of strong (33%) EU price decrease, production costs in most ACP and EBA countries are too high for sugar exports to the Union. Especially high-cost producers in the Caribbean region would be seriously affected. However, some low cost ACP SP signatories such as Malawi, Swaziland, Zambia and Zimbabwe could be expected to expand their production and exports to the EU, taking over most of the SP quotas allocated to countries, which cannot fill these quotas at post-reform EU prices. In order to use all SP quotas as much as possible, the low cost countries mentioned will have to invest heavily in expanding sugar cane production. In this group of countries only Zimbabwe's production costs seem low enough to encourage substantial production expansion. Next to low-cost ACP SP countries, several efficient sugar producing non-ACP LDCs will have big export opportunities to the EU-market. Such LDCs are Ethiopia, Sudan and Mozambique. Once investments have been made, LMC expects these countries may increase exports to the EU to levels between 0.6 and 1.0 million tonnes in 2015. Investments in capacity expansion are, however, hindered by political instability (as is presently the case in Sudan and Zimbabwe). Moreover, the Commission's proposal to review EU prices in 2008 following a first evaluation of the EBA agreement on the EU market creates great uncertainty and may lead to investments decisions being put on hold.

Although the direct effects of the EU trade reform on the Union's import flows are estimated modest, there is much uncertainty about the potential of arbitrage, which is that an EBA country sells its whole production to the EU and imports low(er) priced sugar for domestic purpose. This will occur when there is a positive gap between the EU and world

market price minus the trading/transaction costs this trade involves. Even at EU prices as low as EUR 329/ton raw sugar, arbitrage may prove to be attractive to some countries when international prices are as low as presently is the case. The potential for arbitrage is, therefore, very uncertain. Our model simulations indicate limited arbitrage. This is because we assume that EBA-countries will maintain their current relatively high protection rates. There is however a chance that EBA countries will reduce import protection to allow cheap sugar to come in for domestic use and to allow (a larger share of) domestic production to be exported to the Union. In the most dramatic case - i.e., all sugar production from LDCs would be exported to the EU - LMC estimates an inflow of 4.7-6.2 million tonnes.

Table 1 summarises and compares the main results of the analyses included in this study in terms of addition EU imports from EBA countries. According to our own analyses, EU imports would be much more modest than EC and LMC estimates.

Table 1 Additional EU raw sugar imports from EBA-countries (in million tonnes) a)

	EC	LEI	LMC
Status quo	2.8	0.4 (standard model) 2.7 (perfect substitution)	n.a.
EU reform: 33% price cut	0.5	0.2 (standard model) 0.9 (perfect substitution)	0.1 (short-run) 0.6-1.0 (medium-run)
EU reform including swap-effect	0.5 (2008/9) + 0.75 (2013/4)	0.2 (standard model) 0.9 (perfect substitution)	(maximum) 4.6-6.2

a) EC estimates for EU25, LEI estimates for EU27, LMC estimates for (simply) EU.

This study includes three case studies, to indicate country specific consequences of the EU reform proposal. The case study on Ethiopia - a low cost sugar producer and LDC - shows that the government, as owner of the sugar estates and processing industry, plans significant expansion of the industry's capacity in order to respond to increasing domestic demand and to benefit from increased market access to the EU. Ethiopian analysts estimate export surplus of around 1 million tonnes within ten years, which is double the LMC estimates. These projections are conditional to investment programmes executed and successful market penetration in the region, where Ethiopia may find strong competition from other low-cost producers such as Malawi, Sudan, Zambia and also Brazil.

The Mauritian case is an example of an ACP SP country in which the sugar industry is very important for the country's agricultural sector and where the sugar industry is heavily dependent on the EU market. EU sugar reforms would have significant negative effects on the industry, enforcing further restructuring. However, Mauritius has already anticipated the upcoming EU sugar reforms to some extent, both with sugar restructuring plans as well as to encourage further the diversification of its economy. Given its level of production costs - even after further restructuring - Mauritius is not expected to play an important role at the international sugar market, even when world prices would rise considerably. The country's comparative advantages are found outside the sugar sector.

Brazil is the world's largest and most competitive producer of sugar and ethanol, and has become the leading sugar and ethanol exporter in the 1990s. The EU sugar trade reform is expected to allow Brazil to expand on third country markets, as the EU retreats from export markets. Further restructuring and expansion of the Brazilian sugar industry

will enhance the competitiveness of Brazilian sugar industry. Estimations about future levels of Brazilian sugar production (by OECD and Cargill) predict that Brazil will increasingly dominate the international sugar market.

The reform of EU's sugar trade regime induces shifts in the system of trade preferences. Some countries lose other benefit. Most analyses of the consequences of EU's proposals are only focused on the direct effects for the sugar sector, without proper attention to economy-wide adjustments. Capital and labour may find remunerative alternative uses and the respective economies may diversify. Research based on our own model instrument indicates that income effects of proposed trade regime changes are not detrimental for the ACP and EBA countries as a group. This study also underlines that country situations obviously differ and thus the impact of the trade reforms, on the sugar industry as well as on the economy. When the EU considers support to countries, which claim to lose from the Unions sugar trade regime, it should take such country differences into account. For more profound and complete insights into the country-specific consequences of the EU sugar reform one needs more in-depth country case studies than what has been possible in the framework of this study.

1. Introduction

1.1 Background of the study

The EU common market organisation on sugar is often criticised for a lack of competition, distortions in the market, high prices for consumers, and its effects on world markets, especially in relation to developing countries. Yet, despite calls for reform, the regime has remained essentially unchanged for four decades. The orientation of the CAP, which has moved away from price and production support to farmers' income support policy through the single payment scheme, plus the 2001 Everything But Arms (EBA) trade agreement with the 49 Least Developed Countries (LDCs) added new dimensions to the need for sugar reform.

In 2003, the European Commission proposed several options for revisions of the sugar regime (CEC, 2003). The Commission's report indicates that the most suitable approach to fulfil the Commission's aims in promoting a more market-oriented, sustainable EU sugar sector is a gradual reduction of the internal EU market price combined with direct aid payments and (eventually) the abolition of production quota. In July 2004, the Commission proposed the outline of the future sugar regime in the EU: a significant (33%) reduction, in two steps, of the institutional support price for EU sugar and a reduction of the EU production quota with 2.8 million ton by 2008 (CEC, 2004a). Sugar beet producers would be partially compensated for lower prices by the introduction of a direct decoupled payment, while transferability of quotas between member States and sugar factories would facilitate the necessary restructuring of the EU sugar sector.

Developing countries' export opportunities of (raw) sugar will be affected by such a policy change. With high support prices maintained beyond 2006, EBA countries and African, Caribbean and Pacific (ACP) countries would benefit from the present preferential trade agreements, as they can export to the EU against the high internal prices. When the internal EU prices are reduced to levels the Commission proposes in its July 2004 document, only the most competitive EBA/ACP producers would be able to maintain access to the EU market. According to the Commission's own calculations, this would leave only a small number of developing countries to export to the Union (see CEC, 2003).

The consequences of the EU policy changes for developing countries as depicted by the Commission are mainly based on general assumptions and static analyses. There is clearly a need to study the potential impact on these developing countries more thoroughly to pick out the winners and losers of the expected changes in the EU sugar policy, taking into account dynamic sector and macroeconomic adjustment effects.

This insight is necessary for the EU in order to be able to better weigh the pros and cons of the new policy regime for developing countries, as the present EU policy is severely criticised for being unfavourable for a large part of that group of countries, while the new policy has also negative consequences for some developing countries. Furthermore, the impact of the policy changes on EU imports from developing countries is an important

element of the overall impact assessment of the policy reform on the EU market balance. Therefore, it is critical to have a good understanding of the consequences of the proposed policy option for EU sugar imports from developing countries. At the same time, it is important for developing countries to have a thorough evaluation of the possible impact of the EU sugar policy reforms on sugar production, processing and export opportunities as it may affect the development of their agricultural sector. For instance, the consequences of the EU policy changes also depend on options for alternative crops within the agricultural sector and opportunities in the rest of the economy. Therefore, the evaluation of the consequences of changes in the EU sugar market regime on developing countries should entail a macroeconomic component.

1.2 Objective of the study and research questions

The objective of this research is to analyse the impacts of the EU sugar policy reform on sugar production and export opportunities in developing countries and on EU sugar imports from developing countries in order to support policy formulation of the Dutch Ministry of Agriculture, Nature and Food Quality.

Research questions to be addressed are:

- To what extent will the EU sugar policy reform result in a reduction in (subsidised) exports from and increased imports of sugar within the EU? What will be the effect of reduced production in and exports from the EU on world market prices for sugar?
- Which (group of) countries will benefit from the increased market access to the EU and which (group of) countries will lose markets in the EU?
- What are the macroeconomic effects of these EU sugar policy changes for (groups of) developing countries?
- What are the consequences of the changes in EU trade preferences for (farms, processors and traders in) the sugar sector in (some selected) developing countries?

1.3 Approach

The study uses three different approaches that complement each other. First, we use model simulation to picture the consequences of several policy scenarios for trade flows of the European Union and groups of developing countries. Second, we review literature to address the research questions and third, we further specify our analyses by country case studies. In a synthesis of the three approaches, conclusions are drawn on the consequences of the EU sugar policy reforms for developing countries.

To investigate and analyse the EU sugar policy reform effects on international prices and trade flows (trade levels and origin of imports) between the EU and (groups of) developing countries, a number of model simulations are conducted with help of a global computable general equilibrium model especially designed for our assessment of the sugar reforms (see appendix 1 for an overview and details of the model structure). Simulations focus on assumptions with respect to EU price cuts, increased market access and the possi-

bilities for developing countries to use their sugar production potentials. These model simulations provide answers to the first three research questions of the study.

A review of literature follows, with the aim to compare what is found in other studies with the results of our model simulations. This will further specify the consequences of the policy changes for developing countries. Then, three country case studies are executed to focus on the impact of the EU policy changes for specific developing countries. Each selected country represents a group of developing countries, which are the ACP-countries, the EBA countries and net-exporters of sugar without EU trade preferences. The selected countries are Mauritius - an ACP country with an export quota of almost 500,000 ton - Ethiopia - that is allowed to export 14,700 ton (in 2002/2003) to the EU under the EBA agreement - and Brazil, the biggest sugar exporter of the world. The country case studies provide a description of the sugar sector and stakeholders in the selected countries as well as an analysis of the consequences of the EU policy changes for the stakeholders in the developing country. LEI has executed these country analyses in close co-operation with partner researchers from the selected countries.

1.4 Structure of the report

This report is structured as follows. To picture the context of the study, the main features of the international sugar market are described in chapter 2. Chapter 3 presents an overview of present trade relations and agreements between the EU and (several groups of) developing countries. Then, the study turns its perspective to possible impacts of the policy reforms as proposed by the Commission, in trying to answer the above stated research questions. In chapter 4 own calculations are presented, using a modelling tool, which allows for showing the impacts of several policy scenarios on international trade flows and welfare for a number of groups of developing countries. Chapter 5 reviews literature to indicate the consequences of EU's sugar trade reforms for developing countries. Chapter 6, 7 and 8 follow up by focusing on a number of case studies, identifying the impact of EU policy reforms. Chapter 9 concludes with a synthesis of the outcomes of previous chapters.

2. Features of the international sugar market

2.1 Overview of world production and consumption developments

Sugar is produced in many countries in the world, from either sugar cane or sugar beets. Sugar cane is the source of 75% of global sugar production. Asia is the leading cane growing area, followed by South America and the group of Central American and Caribbean countries. Sugar beet is produced mainly in Europe and North America. Brazil, India, the EU and China are the world's leading sugar producers (see table 2.1). These four countries collectively represent nearly 50% of world sugar production. India is the largest consumer of sugar at around 13% of world consumption, followed by the EU (10%), China (7%) and Brazil (7%).

Table 2.1 Major sugar producers, exporters and importers, 2000-02 average

Main Producers		*Main Consumers*		*Main Importers*		*Main Exporters*	
Country/ region	*Mil. ton*	*Country/ Region*	*Mil. ton*	*Country/ region*	*Mil. ton*	*Country/ Region*	*Mil. ton*
Brazil	21.6	India	17.8	Russia	5.0	Brazil	11.9
India	20.7	EU-15	14.4	EU-15	1.9	EU-15	5.5
EU-15	17.3	China	9.8	Indonesia	1.8	Thailand	4.3
China	9.2	Brazil	9.6	Japan	1.6	Australia	3.6
United States	7.6	United States	9.1	Malaysia	1.5	Cuba	2.6
Thailand	6.5	Russia	6.6	Korea	1.5	India	1.5
Mexico	5.2	Mexico	4.9	Nigeria	1.5	South Africa	1.3
Australia	5.1	Indonesia	3.7	United States	1.4	Columbia	1.3
Pakistan	3.9	Pakistan	3.6	Canada	1.2	Guatemala	1.1
Cuba	3.2	Japan	2.5	Algeria	1.2	Mauritius	0.5
All other	39.5	All other	55.1	All other	27.1	All other	14.3
World	139.8	World	137.1	World	45.7	World	47.9

Note: Data is in raw sugar equivalents.
Source: F.O. Licht's International Sugar and Sweetener Reports, as reported in OECD, 2005:12.

Sugar cane production has more than doubled over the last 40 years, while world sugar beet production has been rather stable over the whole period and shows a slight contraction in recent years. According to FAO data for 2000-2004 world sugar cane production is estimated to average 1,300 million tonnes and world sugar beets production some 240 million tonnes (FAOSTAT). World sugar production has increased over the period but with a stepwise supply response to world price movements. That is, both acreage planted and sugar production have tended to increase in periods of higher prices and this expansion has been followed by prolonged periods of slower growth of production and lower world prices (OECD, 2005:10).

A comparison of '2001' and '1991' production levels and shares for the Top 10 sugar suppliers reveals that major production increases have occurred in Brazil and India (see table 2.2). While the EU has ranked first for several decades, from 1996 onwards India and Brazil have contested the first place (both around 15% of world total in '2001'). Compared to the sixties, sugar production has increased in each of the Top 10 countries, except in Cuba, where production dropped dramatically. However, the rate of growth is uneven. Over the last ten years, production has increased dramatically in Brazil (+121%), India (+54%) and Mexico (+50%), while for the EU-15 no significant trend can be found anymore, with production fluctuating around an average of 17.6 million tonnes.

Table 2.2 World Top 10 sugar producers, comparison '1991' - '2001' (in raw sugar equivalents)

	C=Cane B=Beet	'1991'		'2001'		2001/1991 growth in %
		million ton	share in %	million ton	share in %	
Brazil	C	9.1	8	20.1	15	121
India	C	13.0	12	20.0	15	54
European union (15)a)	B(+C)	18	16	18.0	13	0
China	B+C	8.4	7	8.6	6	2
USA	B+C	6.7	6	7.4	6	10
Thailand	C	4.2	4	6.0	4	42
Mexico	C	3.4	3	5.1	4	50
Australia	C	3.4	3	4.6	3	33
Cuba	C	7.6	7	3.8	3	-50
Pakistan	C	2.2	2	2.7	2	20
Top 10		76	67	96.2	72	26
World		113	100	134.1	100	19

a) includes sugar from cane. '2001' means average for the years 2000 to 2002. Note that '2001' production according to this source differs from the source in table 2.1.
Source: EU DG-AGRI, 2003: 11, table 1.1, based on FAOSTAT.

Global consumption of sugar has been increasing over time, mainly due to population and income growth in the developing countries. These countries now account for about 70% of world sugar consumption, compared to less than 50% in 1980. Sugar consumption in the developed countries has shown little or no growth. Overall, over the last decades global production growth has been faster than consumption growth, leading to an accumulation of sugar stocks. These stocks are estimated at 47.5% of the global sugar use in 2003-4 and depress international sugar prices (OECD, 2005:10).

2.2 Features of international trade in sugar and world sugar prices

Trade flows

Sugar trade is dominated by Brazil and Russia, with Brazil accounting for about 25% of all exports and Russia accounting for 11% of world imports during 2000-2002 (see table 2.1). The EU is the second largest exporter, followed by Thailand, Australia and Cuba. The five largest exporters have a combined export share of over 60%, which implies high degree of market concentration on the supply side. Importers are widely dispersed after Russia, with

the EU being the next largest importer followed by several countries accounting each for 3-4% of global sugar imports.

Brazil has been a significant exporter since the seventies. Exports have increased rapidly in line with production since the nineties. In 1999, exports reached an unprecedented level (13 million tonnes). This is mainly explained by the liberalisation in the ethanol sector. As guaranteed prices and direct subsidies have been phased out, there has been a significant shift from ethanol to sugar production and exports (see also our case study on Brazil in chapter 8). The EU is both a leading exporter and importer. It turned into a net exporter at the end of the 1970s, mainly due to increased production and stable consumption. Exports increased in the years just before and after 1980. Since the mid-1990s EU-15 sugar exports have fluctuated between 4.4 million tonnes and 6.4 million tonnes, the average being 5.1 tonnes over the period 1995-2002.

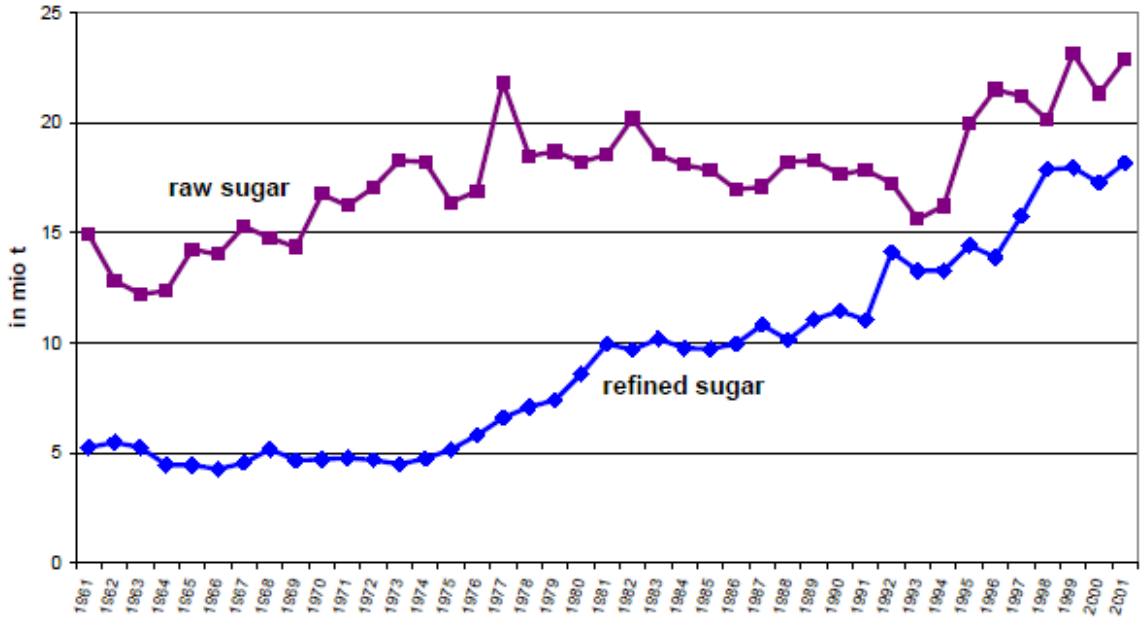


Figure 2.1 World exports of raw and refined sugar (million tonnes), 1961-2001
Source: EU DG AGRI, 2003: 23

Most trade (in volumes) is in raw sugar (see figure 2.1). In the 1960s and 1970s trade in raw sugar accounted for about 75% of all sugar trade. This share in trade has been on a declining trend from the mid-seventies up to the mid-nineties as the trade in refined sugar steadily increased. Since 1995, exports have been expanding for both types of sugar. Raw sugar remains the mainly traded form, but its share in total exports is declining (in refined equivalent, it is just slightly above 50%). The EU is the world's leading exporter of refined sugar, but the value has globally declined since the mid-nineties (EU DG-AGR, 2003:24). In addition to raw sugar, Brazil and Thailand also export refined sugar. India and Turkey appear in the Top 5 of exporters of refined sugar (in value), while their share in total exports remains limited.

Trade in sugar has a strong regional character. Australia and Thailand are the major suppliers to the Asian market, whilst Brazil and the EU along with Cuba are the major suppliers to the East European and CIS market (OECD, 2005:13). Most trade - around 60% - takes place under long-term contracts, preferential and regional agreements, and with subsidies. A minor share - 40% - is traded at world market prices.

World sugar prices

As a relatively high share of world sugar production enters trade (around 30%, see table 2.1), the world market price of sugar is of considerable importance to many countries, especially to those whose exports are not part of preferential agreements. World sugar prices have historically been characterised by a high degree of volatility compared to other agricultural products. Figure 2.2 illustrates the volatility of world raw sugar prices, with price peaks in the 1970s and 1980s surpassing those of more recent years.[1] LMC (2004b:A10) points at an average duration of world sugar price cycles of around 6 years. OECD (2005) concludes that price volatility is on a decreasing trend, with lower price peaks and more regular low price cycles in the last 20 years. Clearly, prices show a decreasing trend since 1995. This is mainly explained by an overall excess of production over consumption, as measured by the rise in the stock to use rate. From their low point in 1999/2000 (€110/ton in April 1999), as a result of a shortfall in production in several leading suppliers, raw sugar prices shortly improved over the marketing year 2000/01, reaching an average €240/ton. By the following year they had declined again to €180/ton. The average for the first quarter 2003 was even lower, down to €170/ton. Largely due to the strengthening of the euro against the US dollar in 2004, the world market prices have further declined to around €140/ton of raw sugar in the last quarter of 2004 (oral information from meeting with LDC sugar group, 26/11/2004).

Why are world sugar prices volatile with prolonged periods of low prices? There is a number of arguments for this. As mentioned, production, following periods of high prices, tends to increase faster than consumption and is not responsive to downward price movements. Some basic features of the crop and the processing contribute to this tendency. Sugar cane production will not respond to changing market conditions on short notice; it is a semi-perennial crop that allows consecutive harvests (normally 5-6 years) from an individual planting (which explains a cyclical price pattern of around six years in duration). A lack of alternative crops may also contribute to slow production responses to lower sugar prices. Moreover, the sugar beet and cane processors (millers) are highly capital-intensive operations and tend to take a long-term view of the market. They will, therefore, continue to produce sugar during periods of low prices and delay adjustments in production capacity. By contrast, supply is very sensitive to weather. Revisions in production estimates often cause significant adjustments in international prices. Another important factor in explaining the low responsiveness of sugar supplies is the role played by government support policies. As a consequence of government intervention in national sugar markets, the majority of global sugar production and trade takes place at subsidised or protected prices that bear little relation to international market levels. Such government support policies are not

[1] As the share of international trade is higher for raw than for white sugar, prices for raw sugar are more exposed to volatility than prices for white sugar.

only utilised by OECD countries; also many other (non-OECD) countries like Russia, China, Thailand and India protect and regulate their domestic sugar industries (see for instance, OECD, 2005: 31-32).

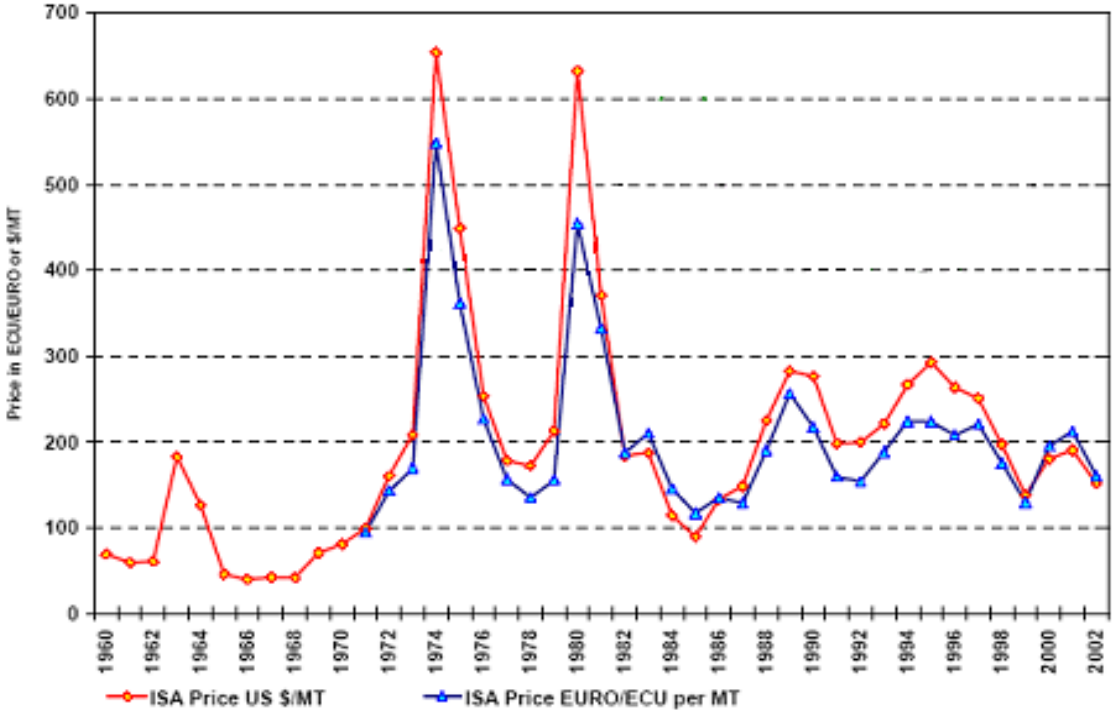


Figure 2.2 Trends in world raw sugar price (ISA sugar price, yearly average, 1960-2002)
Source: EU, DG-AGRI, 2003: 26.

A special role is attached to the oil price development: analyses show that the high prices of oil in the mid-seventies and beginning of the eighties have played a significant role in the formation of peak prices for sugar (EU DG-AGRI, 2003:228-29). Among the Top 10 sugar importers, there are leading oil exporters. They rely on sugar imports for meeting domestic demand, that is very income elastic. High oil prices can boost sugar prices for a second reason that cumulates the effect of the first one mentioned: it possibly limits Brazilian exports. A rise in oil prices is likely to stimulate ethanol uses in Brazil, although this depends on relative prices of ethanol versus oil-products as well as on the minimum rate of blending set by the government.[1] In the short run, an increase in the percentage of blending shifts uses of sugar cane towards ethanol, hence a decrease in export

[1] As a reaction to the 1973 oil prices Brazil introduced guaranteed prices for ethanol, processed from sugar cane and controlled the distribution by the state-owned oil company. Policies have been liberalised by the end-1990s but the Brazilian government still fixes the minimum rate of blending with petrol (see also our case study on Brazil in chapter 8).

availability of sugar and a possible rise in world prices. In the long run, however, the prospect of enhanced ethanol uses in Brazil or elsewhere provides an incentive to expand the supply of sugar cane. If ethanol uses are not in line with expectations, the sugar market turns out to be the residual variable. This enhances the volatility on world markets.

3. EU's sugar trade system

3.1 General features

The EU Common Market Organisation (CMO) of sugar has established minimum support prices for sugar guaranteed by an intervention purchase system. Producer prices are at levels above world market prices but price support is limited to the A and B quota sugar. Only quota-sugar can be sold in the EU. Sugar produced in excess of the A and B quotas - C-sugar - has to be sold on the world market without the support of export refunds/export subsidies. As EU internal demand is less than the A+B sugar quotas, the EU is also exporting surpluses of sugar with export refunds. Consequently, the EU has been distorting international trade flows.

Although the CMO of sugar exhibits a high degree of protectionism, the EU has granted a whole array of bilateral trade concessions to certain developing countries. Over the years, the EU has established a complex system of trade arrangements, which is reflected in the complex network of discriminatory tariffs and through generalised, country-specific or region-specific trade preferences. Thus, the EU sugar trade policy has deviated widely from the non-discrimination principle of the WTO, and it applies different policies to different regions and trading blocs. Currently, the EU is engaged in negotiating or implementing trade agreements that are unilateral, bilateral, regional and multilateral in nature.

The complex hierarchy of trade arrangements between the EU and specific groups of countries *vis-à-vis* the EU sugar regime is summarised in figure 3.1. It presents the different trade agreements that affect the EU sugar regime, including the WTO, EU enlargement, African, Caribbean and Pacific (ACP) Countries, Least Developed Countries [LDCs], Overseas Countries and Territories (OCTs) and the Western Balkans. A feature of the trade concessions provided by the European Union is that these sugar imports receive the high EU price for sugar. Details of these preferential trade agreements are provided below, after having presented the GATT/WTO trade agreements on sugar.

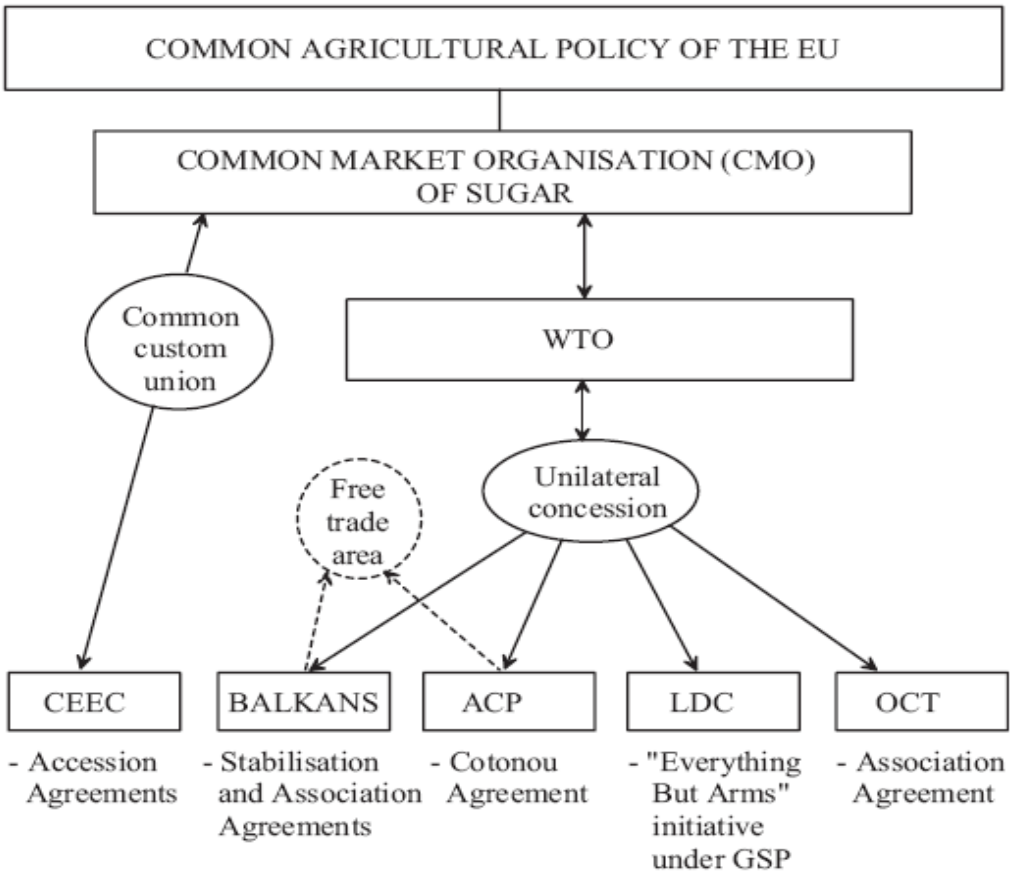


Figure 3.1 The EU sugar regime and trade agreements
Source: Huan-Niemi and Niemi, 2003:5.

3.2 WTO

Agricultural trade was submitted to the rules of the World Trade Organisation (WTO) and the General Agreement on Tariffs and Trade (GATT) for the first time on 1 January 1995, further to the conclusion of the Uruguay Round of Negotiations. The WTO Agreement on Agriculture was mainly concerned with rules and commitments in three areas: market access, domestic support and export competition. The implementation period of the commitments was between 1995 and 2000 for developed countries and a further four years for developing countries (to 2004). The UR commitments for EU on sugar were to reduce import tariffs by 20% and to limit the volume of subsidised exports with 21% and the amount of money spent on export subsidies with 36%. However, the export commitments were made net of 1.6 million tonnes of imports from ACP countries and India: the EU did not make any reduction commitments on exports of sugar of ACP and Indian origin and this was accepted by the signatories of the Agreement. According to the agreement the EU faces a GATT ceiling on subsidised export volume of 1.273 million tonnes white sugar whereas the value of subsidised exports should remain below the limit of €499.1 million.

The required reduction in the volume of exports and budgetary export outlays for export subsidies did not cause any difficulties for the EU at the beginning of the Uruguay Round. Yet, the export subsidy commitments became very binding by the end of the UR, leading to the 'temporary cut' in production quotas for sugar in the marketing year 2000/2001. Actually, the EU is able to stay within the export subsidy commitments by cutting the production quotas yearly, if necessary, when the EU is in danger of breaching the commitments for export subsidy.

In the present, ongoing WTO Doha Development Round stakeholders have submitted various proposals for further reductions of export subsidies and import tariffs (see website www.wto.org for an overview). However, after three years of negotiations little progress had been made. In July 2004 the parties agreed on a framework for further liberalisation, yet without mentioning any concrete percentage of reduction commitment. In the framework agreement the EU agreed to phase out its export refunds on condition that its trading partners also got rid of their export subsidy programmes. On the issue of market access, the EU is committed to considerable market opening, but will also look for comfort for certain 'sensitive' products. The mini-Ministerial Meeting on Mombasa (Kenya) in March 2005 gave some impetus to the negotiations (see Europe Rapid, 2005).

Meanwhile Australia, Brazil and Thailand have formally complained at WTO about the EU's re-exports of ACP sugar with export subsidies, which is outside EU's UR export subsidy reduction commitments. The three major sugar-exporting countries claim that this 'waiver' is illegal and against the UR trade agreements. Moreover, the three countries argue that EU exporters of 'C-sugar' are exporting that non-supported sugar at prices below their production costs because of the cross-subsidy from the main A and B quota sugar of the EU sugar regime. Therefore, these countries are challenging in the WTO that C-sugar exports are in contravention of the commitments made by the EU in the WTO on subsidised sugar exports. A WTO sugar panel has confirmed that EU sugar export subsidies used to re-export the preferential sugar imports from ACP countries are wrongfully excluded from the WTO commitments on reducing export support. The European Commission has lodged an appeal against the WTO report in January 2005.

3.3 Preferential trade arrangements for sugar[1]

EU enlargement

10 New member states from Central and Eastern Europe (Poland, Hungary, Czech Republic, Slovenia, Estonia, Latvia, Lithuania, Slovakia, Cyprus and Malta) joined the EU-15 in 2004. Romania and Bulgaria are expected to join in 2007. The accession of these countries is expected to result in a greater net contribution to EU sugar consumption than production and thus not overly burden the sugar regime. However, before their accession the new member states satisfied their sugar consumption deficits by imports from a group of third countries (e.g. Australia, Brazil, Cuba, Guatemala, Mexico and Nicaragua) which will need to be compensated under WTO rules for any loss of access following the common market

[1] This sub-section draws heavily on appendix C in a not yet declassified OECD report on sugar policy reform and trade liberalisation, March 2005.

enlargement. In this respect, access quotas for raw sugar are already allocated to a number of third country exporters (primarily Cuba and Brazil and amounting to 85.5 thousand tonnes) and are known as imports under Most Favoured Nation (MFN) as a result of the accession of Finland, Austria and Sweden in 1995. An import duty of €98 per ton is charged on MFN imports. Following the MFN import precedent, the European Union will either have to allocate additional 'current access' quotas to existing third country exporters to the new member states, based on historical access and estimated to be around 490,000 tonnes, or compensate them in other ways (Huan-Niemi, 2003).

The ACP sugar preferences

The *Sugar Protocol (SP)* with 20 signatory countries within the group of 77 African, Caribbean and Pacific Countries[1], and India represents the largest volume of sugar imported by the European Union under preferential access arrangements. Under this protocol, the EU has a non-reciprocal obligation to the signatory countries to purchase a fixed amount of ACP raw cane sugar from them at the EU intervention price (see table 3.1). This protocol dates back to the time when the United Kingdom joined the common market in 1973. At that time, the United Kingdom imported annually around 2 million tonnes of raw sugar a year under the British Commonwealth Sugar Agreement. The ACP Sugar Protocol effectively translated a UK commitment to the Commonwealth into an EU commitment to the ACP countries. The import commitment was reduced from about 2 million tonnes imported by UK sugar refineries under the old agreement to 1.3 million tonnes of raw sugar (in white sugar equivalent) at the EU guaranteed price (€523.70 per ton, c.i.f. Europe for raw cane sugar) on a duty-free basis. The Sugar Protocol, based on unilateral, non-reciprocal trade preferences granted by the EU, was initially embodied in the Lomé Convention of 1975 and its subsequent extensions leading up to the Cotonou Convention of 2000. Under this agreement, the EU and ACP countries have entered into negotiation of economic integration agreements, known as Economic Partnership Agreements (EPAs) to progressively remove barriers to trade between them and which are to enter into force by 1 January 2008. The unilateral trade preferences will continue to be applied during the period 2000 to 2007.

Additional quantities of raw sugar for processing are also imported by the EU under the *Special Preferential Sugar (SPS)* arrangements. In 1995, as part of a new sugar import regime, the EU introduced the *maximum supposed needs (MSN)* concept for the four EU member states with raw sugar refining industries (the United Kingdom, France, Finland and Portugal). Currently the MSN is fixed at about 1.765 million tonnes, white sugar equivalent, and like production quotas can be reduced to meet WTO commitments. The current SPS agreement is for an initial period of six years to June 2006. The SPS amount is the difference between the MSN and sugar imports from French Overseas Departments (DOM), those under the ACP/India quotas, the MFN sugar quotas and, more recently, the EBA sugar import quota. No import duty is paid on the SPS sugar, which receives €496.8 per ton (EU support price for raw sugar minus a refining aid of €26.9 per ton). Following the *'Everything But Arms*' Initiative (discussed below), the volume of SPS sugar has been

[1] ACP member states who are not party to the Sugar Protocol may apply to join it provided the existing members and the European Commission agree. In 1995, Zambia acceded on the basis of a zero quota but fully benefits from possible re-allocations of the quotas.

reduced to about 217,000 tonnes in 2002-03 (see table 3.1). Further reductions in the volume of SPS sugar are expected due to increases in EBA quotas and possible cuts in the MSN.

Table 3.1 ACP SP and SPS sugar quotas and average production levels (in tonnes white sugar equivalent) a) b)

Countries	SP quota allocation 2003/04	SPS quota allocation 2002/03	Production, average 2001/03
Barbados c)	32,097	0	40,000
Belize	40,349	5,527	105,000
Congo e)	10,186	2,249	41,000
Cote d'Ivoire	10,186	9,704	144,000
Fiji	165,348	21,060	304,000
Guyana	159,410	17,111	282,000
Jamaica c)	118,696	18,894	164,000
Kenya	5,000	10,908	418,000
Madagascar c) e)	10,760	0	36,000
Malawi d) e)	20,824	9,897	222,000
Mauritius	491.031	21,266	545,000
Mozambique e)	6,000	0	140,000
St. Kitts c)	15,591	0	19,000
Swaziland d)	117,845	45,030	569,000
Tanzania e)	10,186	2,183	159,000
Trinidad c)	43,751	5,658	82,000
Zambia d) e)	7,215	12,863	203,000
Zimbabwe d)	30,225	29,948	489,000
Total	*1,294,700*	*217,298*	*3,962,000*

a) Surinam and Uganda are part of the SP but have no sugar quota agreed with the EU; b) Rounded figures.
Source: www.acpsugar.org

The Balkan Free Trade Agreement

In 2000, the EU introduced several measures to encourage trade with the western Balkan region to shore up its stability and to promote association agreements with individual countries of the region. Duty free access for agricultural products, including sugar, was granted to Albania, Bosnia-Herzegovina, Croatia, Macedonia, Serbia and Montenegro. The Balkan region has historically been a sugar deficit region requiring significant amounts of sugar imports, traditionally from the EU. However, high EU prices have been attractive to Balkan producers and encouraged a sharp increase in exports to the Union, which are estimated at over 228,000 tonnes in 2002. Concerns within the European Commission that part of the export growth was the result of fraud lead to the temporary suspension of duty-free access to the EU for exports from some countries in the region. Special rules of origin apply to imports from the Balkan countries. These restrict imports to sugar manufactured from beet or cane harvested in the exporting country concerned. Under standard EU rules of origin, the country of manufacture of the sugar is the country of origin. As part of the reform of the CMO for sugar, the EU agreed with Serbia-Montenegro, Bosnia-Herzegovina and Albania a future ceiling on zero-tariff shipments of domestically produced sugar to the Union of 180,000 tonnes, 12,000 tonnes and 1,000 tonnes respectively. The quota system

will enter into force on July 1 2005 replacing the current provisions. Quotas for Croatia and Macedonia will be negotiated separately and later (Agra Europe, 11 February 2005).

Everything But Arms Initiative

In March 2001 the European Union extended its Generalized System of Preferences (GSP) to give duty-free access to all exports, except arms from least developed countries (LDCs) with the exception of three sensitive products that included sugar. For sugar, free access to the EU market is being phased-in with the implementation of the duty reductions delayed until 2006 through to free access in 2009 (see table 3.2). Duties on sugar are to be reduced by 20% on 1 July 2006, by 50% on the 1 July 2007, by 80% on the 1 July 2008 and eliminated on 1 July 2009. Until 2009, annual duty-free quotas allocated to applicant LDCs are being increased each year by 15% from 74,000 tonnes in 2001-02 to 197,000 tonnes, white value, in 2008-09. From 2009 imports of sugar from the LDCs will not be subject to quantitative restrictions, but to rules of origin. That is, sugar originating from outside the LDCs will not be eligible for duty-free status. However, the EBA trade concession allows *cumulation* between the least developed countries and the Association of Southeast Asian Nations (ASEAN), the South Asian Association for Regional Cooperation (SAARC) and the European Union. The increase in LDC sugar imports during the transition period will have no effect on the EU market, as these imports will be directly offset by reduced imports of the same amount of SPS sugar from the ACP countries.[1] The EU Commission estimates a (maximum) potential import of about 3 million tonnes of sugar entering the EU market in 2010 as a result of the EBA Initiative (CEC, 2004b). Imports of this volume are likely to cause serious disturbance to the EU market and, thus, trigger built-in safeguard measures, unless the sugar support system is modified.

Table 3.2 Phasing in of duty free access for sugar under the EBA

Year	Raw sugar quota (tonnes)	Duty reduction
2001/02	74,185	
2002/03	85,313	
2003/04	98,110	
2004/05	112,826	
2005/06	129,750	
2006/07	149, 213	20%
2007/08	171,594	50%
2008/009	197,334	80%
2009/10	No quantity limit	Duty free access

Source: European Commission, (2004b).

Overseas Countries and Territories

The overseas countries and territories (OCT) are those that have a special relationship with one of the member states of the European Union and provide for associate status of these countries and territories. The OCT benefit from preferential market access to the EU mar-

[1] The SPS 2002/03 basic allocation to ACP Sugar Protocol signatories was 217,000 ton (white sugar equivalents).

ket. Products originating from OCT are not subject to import duties or quantitative restrictions. These arrangements are non-reciprocal and the OCT gain from the *cumulation* of origin with the ACP countries: i.e. a product exported to the EU from an OCT, but composed of products from an ACP country (or another OCT or the EU) may benefit from the preferential access arrangements. In the 2001 review of the OCT arrangements, an annual import quota of 28,000 tonnes has been imposed on sugar coming from the OCT. This quota is phased-out over three years, so that on 1 January 2011 it is eliminated. Imports above the quota are subject to normal duties unless the sugar is processed into a product not under the sugar tariff heading.

3.4 The impact of trade arrangements on EU domestic market equilibrium

The EU sugar CMO strongly affects the EU trade in raw and refined sugar. EU exports of sugar consist of a surplus on A- and B-quota, plus what is additionally produced as C-sugar. Over the period 1995-2003 exports fluctuated between 4.1 and 5.9 million tonnes (see figure 3.2). The sugar produced under quota A and B can be exported with subsidies but only within the limits agreed in the WTO at 1.3 million tonnes for the EU15.[1] In 2001/02 the EU exported 1.1 million tonnes of 'A' and 'B' sugar with an average export restitution of €459 /ton (CEC, 2004b). Including 1.6 million tonnes of re-exported ACP, India and EBA sugar - which exports are exempted from the WTO export support reduction commitments by special concession - total EU exports with subsidies amounted to 2.7 million tonnes. The EU15 also exported a large share of 'C' sugar - 1.4 million tonnes - without subsidies.

The EU exports only refined white sugar. Exports are to a wide range of countries in Africa, (East) Europe, Middle East and some Southeast Asian countries. Major destinations - countries to which the Union has exported over 100,000 tonnes annually in the most recent years, 2001-2003 - were Algeria, Egypt, Indonesia, Iraq, Israel, Lebanon, Libya, Norway, Persian Gulf, Switzerland and Syria.

EU-15 sugar imports have been rather stable over the period 1995-2003 (see figure 3.2), fluctuating between 1.8 and 2.1 million tonnes annually.[2] Compared to the level of 2000, the years 2002 and 2003 show a significant increase in the volume of imports, due to increased imports from Serbia and Montenegro and Croatia as part of the Balkan Free Trade Agreement and due to imports from some LDC's that benefited from the EBA agreement. Annual imports in 2000/03 from the Balkan countries were (on average) 160,000 tonnes of white sugar. Brazil and Cuba benefit from a MFN tariff quota (imports of 82,000 tonnes of raw sugar at MFN tariff of €98/ton). The bulk of the EU imports are from ACP countries and India: 1.6 million tonnes of raw sugar under the Sugar Protocol

[1] The 10 new member states have to comply with a WTO ceiling of 145,000 tonnes subsidised exports. In 2001/2002, the 10 new Member States exported 108,000 tonnes with subsidies. On their side, the 10 new member states had in the same period about half of a million ton of sugar exported without subsidies.

[2] These imports are largely raw sugar. Until 2001 the percentage of white sugar imports was only about 10% of the total sugar imports. In 2002 and 2003 the EU imported significant volumes of white sugar from Serbia and Montenegro and from Croatia and the share of with sugar imports increased to around 20% in those years.

and SPS. Only 60,000 tonnes (in raw sugar) came from LDCs/EBA countries in these first years the EBA agreement was implemented.

Figure 3.2 EU exports and imports in raw and refined sugar, 1995-2003, in tonnes
Source: Eurostat

In a background note no. 4 to the sugar policy reforms the Commission (CEC, 2004c) provides an overview of the actual sugar trade flows in which the EU is involved and explains its expectations with respect to potential trade flows involved in the international agreements that may upset the domestic equilibrium of the sugar market in the near future. The low cost of production and potential to increase sugar production in a number of EBA countries like Sudan, Ethiopia and Mozambique, and the possibility to implement SWAP practices (three-way-trade or arbitrage, see section 5.6 for a discussion on this issue) are the base for Commission estimates of a potential import of about 3 million tonnes from LDCs in 2010 under the status quo scenario. This is significantly higher than total current (2004) imports of the EU-25.

4. Impact of the EU sugar reform policy reform on trade and welfare in developing countries: a modelling approach

4.1 EU policy reforms and implications for the international sugar market

The Commission's proposal for a sugar policy reform is laid down in the July 2004 Communication (CEC, 2004). Important elements for this study are that the Commission proposes to reduce EU support prices for sugar by one third over 3 years and aims at reducing EU production quotas by 2.8 million tonnes over 4 years. As regards trade implications, the Commission estimates that the current levels of around 2.5 million tonnes of subsidised exports (including ACP re-export) will be reduced to just 0.4 million tonnes, due to the drop in production and unchanged consumption in the EU-25. The Commission wants to convert the Western Balkan arrangement into a Tariff Rate Quota in order to preserve their present export levels to the Union. For imports from ACP - and from LDCs under the EBA agreement - the existing preferential duty arrangements will be continued. This implies that ACP import quota will not be touched, yet the developing countries will face lower EU prices for these imports making the EU market less attractive. The Commission estimates that the reduced attractiveness of the EU market will mean that preferential imports will only rise from 1.9 million tonnes to 2.4 million tonnes in 2008/9 (for EU-25). The main driver of the increased level of the imports would be the impact of free market access for LDC under EBA agreement (see CEC, 2004b), which will lead to an extra 500,000 tonnes of imports from LDCs.[1] Given the uncertainty of the real effects of the EBA agreement and the outcome of the ongoing WTO round, the Commission calls for a review of price and quota levels in 2008.

4.2 Impact analysis of EU sugar policy reform by model simulation

In order to quantify the effects of the proposed changes in the EU sugar trade regime ourselves, LEI has developed a sugar model (see box 4.1 for features of the model and its database). With this model, we are able to simulate global trade effects of EU reforms in a consistent framework, yet under the technical conditions (and limitations) of the model used.

4.2.1 Scenarios

We have done two simulation scenarios. The first one is the 'Everything but Arms' (EBA) scenario, simulating free market access of LDCs to the EU. This scenario is designed to as-

[1] Projecting a sugar market balance for 2013/14, the EC foresees imports of 1-1.5 million tonnes from LDCs. The Commission estimates that LDC will export 0.5 million tonnes because of increased production and shifting third market exports to the EU market, and indicates to expect that these exports might be accompanies by swap trade flows at a level of around 750,000 tonnes (CEC, 2004d).

sess the effects of the EBA initiative, including free market access in all the other sectors besides sugar, and keeps constant all other policies (including the EU sugar policy). The second scenario is the Fischler (EU) scenario, simulating the Commission's July 2004 reform proposal. The Fischler scenario is additive on top of the EBA scenario and is used to assess the effects of the reform proposals in the situation when EBA is implemented. The details of the two scenarios are given below.

It turns out that the results for the EU sugar market depend crucially on the degree of substitutability between domestic EU sugar and imported sugar. Most other models[1] assume perfect substitutability between the different varieties of sugar, which leads to high estimates of changes in imports if the EU changes its trade and domestic policies. However, sugar may in fact not be such a homogenous commodity, and additional cost must be incurred to refine imported raw sugar into an equivalent quality of EU white sugar. Hence, a relatively larger price drop for imported sugar is required to induce EU refineries to switch to the imported variety. If imported (raw) sugar is imperfectly substitutable for domestic (raw) sugar than the estimated markets effects will be smaller compared to other simulation exercises. Our econometrically estimated trade elasticities show in fact less than full substitutability. In order to provide insight into the sensitivity of our results with respect to degree of product differentiation, we present additional calculations in which sugar is (almost) perfectly substitutable between domestic and foreign sources. In this way, we obtain two benchmarks, and a bandwidth, for the sugar market effects.

Features of the simulation model are described in box 4.1. More (technical) details on the model are provided in appendix 1.

The details of the two scenarios are as follows:

Scenario 1. The EBA agreement (EBA):
- elimination of sugar tariffs and quota for EBA imports into EU27;
- elimination of EU27 tariffs on other products from EBA countries.

Scenario 2. Fischler's sugar reform proposal (EU):

a. Trade reform:
   - elimination of sugar tariffs and quota for EBA imports into EU27;
   - elimination of EU27 tariffs on other products from EBA countries;
   - 193,000 tonnes sugar import quota under the Balkan agreement, such that total SP/SPS and MFN imports amount to 1.96 million tonnes;
   - no changes to ACP quota and import regime vis-à-vis other suppliers. Trade remains essentially regulated. We capture this trade regulation through modelling of prohibitive tariffs (or alternatively as a quota with quota rents).

b. Internal reforms:
   - sugar beet quota down by 16% (from 17.4 million tonnes to 14.6 million tonnes);
   - compensation payments: €9.45 per tonne quota (modelled as transfer payment to value added in beet production);

[1] E.g. OECD (2005), Borrell and Pearce (1999), Devadoss and Kropf (1996) (the latter two discussed in Van Tongeren et al., 2001).

- reference price white sugar down from €631.9/tonne to €421/tonne. This 33% decline is modelled through an explicit reduction of the reference price, which transmits partially to declines in market prices. The price transmission is governed by the net export position of the EU: if net exports decrease, the market price fall is dampened;
- in addition, we match the drop in market prices with reduction of the rate of export subsidies.

Our sugar model is distinct from most other models used to assess sugar reforms in that it is a general equilibrium model. This type of model provides a picture of the entire economy and of the inter-linkages between the various sectors. The choice for this type of modelling approach is motivated by two critical considerations. First, the interaction between sugar and other crops in land allocation is important inside the EU and in other regions. Second, for developing countries where sugar represents a sizeable portion of the domestic economy, it is important to come to grips with the opportunities to diversify in alternative activities if sugar becomes a less attractive crop. Our model, which is called GULA (the Bahasa Indonesia word for sugar), inherits many features from the modelling framework of the Global Trade Analysis Project (GTAP), and it adds specific features that are relevant for the sugar market. Being a so-called Computable General Equilibrium (CGE) model, the model solves simultaneously for prices and quantities such that all markets are cleared. The model has the following distinguishing features:

- an elaborated model of land allocation over alternative crops. The 'land tree' follows the approach taken in OECD work (see Huang et al., 2004) and allows for better land market modelling. The key idea is that land can move across alternatives uses in response to relative returns. The ease of re-allocation is determined by agronomic features. For example, grains and oilseeds can easily be grown on the same land (but not at the same time) while it is more difficult to move land from grains production into horticulture. The parameters of the land markets model are calibrated to econometric evidence on land supply;
- factor market segmentation between agriculture and non-agriculture. Wage differentials and differences in returns to assets are modelled through segmented factor markets for labour and capital. The parameters are calibrated to fit estimates of the elasticity of labour and capital supply reported in OECD (2001a);
- modelling of sugar (beet) production quota in the EU in such a way that we allow for endogenous regime switches from a state when the output quota is binding to a state when the quota becomes non-binding. In addition, changes in the value of the quota rent are endogenously determined;
- similarly, we model the sugar import regime of the EU as a system of bilaterally allocated import quota;
- the sugar sector in the EU is modelled as a vertically integrated chain consisting of beet producers and sugar processors. The integrated sugar complex uses internal transfer prices that allow for sharing of quota rents between the two parties;
- the sugar processing activity in the EU is characterised by increasing returns to scale. The sector responds to lower sugar prices (and hence lower profit margins) by contracting its scale of operations. See Francois et al. (2005) for technical details;
- an explicit price transmission system for sugar is modelled that allows market prices fall to a reference price level set by the European Commission. See Van Meijl and Van Tongeren (2000) for technical details.

Database

- GTAP 6.05 pre-release (November 2004), amended with ISO Yearbook 2002 data on sugar production, consumption and trade in physical units (tonnes) and expressed in raw sugar equivalent.
- The world is divided into 12 regions and each regional economy has 7 traded commodities. We include an European Union with 27 member states in the model, hence we already anticipate that the sugar reforms will be effectuated in a future situation with Bulgaria and Romania included in the Union.
- New parameters for trade elasticities are taken from Hertel et al., (2003).

Box 4.1 Features of the simulation model

4.2.2 Results

The simulation results have to be interpreted as medium term outcomes in the following sense: there is no additional investment in e.g. processing capacity and changes in sugar production have to come from reallocation of land between other crops and sugar crops. It is assumed that no additional land will be taken into production. The allocation of land is driven by relative returns of land in alternative uses. For example, if opening of the EU sugar markets makes it more profitable to export and grow sugar in EBA countries, land is moved from (for instance) grains towards sugar cane.

The EBA scenario
This is the most straightforward experiment: tariffs and quota for EBA imports into the EU-27 are eliminated and everything else is kept constant at pre-simulation levels.

The model results show how trade and production patterns are influenced under this unilateral move by the EU-27. The duty free access for EBA countries is simulated to lead to an increase of 384,000 tonnes of sugar exports to the EU-27 to reach a total of 444,000 tonnes, see Table 4.1.This almost six-fold increase of sugar exports to the EU is achieved from four sources:

1. expansion of EBA sugar production by about 142,000 tonnes (2.4% of its base volume, see table 4.5);
2. expansion of imports of sugar from non-EBA countries, to the tune of 133,000 tonnes (= 118,000 + 15,000. See column 'EBA non-ACP countries' in the second half of Table 4.1, indicating the changes of the experiment with respect to the base situation). For example, Brazilian imports are simulated to increase with 34,000 tonnes. This 'triangular' trade patterns arises because non-EBA countries continue to be restricted in their EU exports, and find it profitable to channel additional exports through EBA countries. These EBA imports will be re-exported to the EU. However, imports in many EBA countries are subject to import protection measures at the borders, which are significant in many cases. This mechanism restricts the amount of imports from non-EBA countries and therefore also the exports from EBA countries to the EU from this source;
3. diversion of trade away from other export destinations, including intra-EBA trade, totalling 41,000 tonnes (= 384,000 - 343,000);
4. A decline of domestic sugar consumption in EBA countries by -83,000 tonnes, mainly arising from a decline of consumers demand for EBA sugar (and a substitution towards imported sugar).

The overall trade and production effects appear limited and would give little rise to concerns about dramatically rising imports into the EU: total imports increase by 384,000 to 2.8 million tonnes. Import from EBA countries increase to 384,000, which is beyond the bounds of EBA agreement, which speaks about a quota of 197,000 tonnes by 2008/9, but allows free imports thereafter.

Table 4.1 Bilateral trade effects of the EBA scenario (in 1000 tonnes)

EBA-scenario	TOTAL exports	of which to:						
		EU27	ACP sugar protocol countries	EBA (non ACP) countries	Brazil	Sugar dev countries no prefs	Thailand & Australia	All other countries
European Union 27	6,631	0	107	910	64	150	171	5,229
ACP SP countries	2,283	1,574	56	79	0	181	0	393
EBA (non-ACP) countries	1,217	444	25	433	9	34	0	272
Brazil	11,209	656	39	860	0	54	0	9,601
Sugar dev. countries with no preferences	5,417	50	102	1,003	0	59	5	4,198
Thailand & Australia	6,913	0	70	117	0	5	0	6,720
All other countries	7,908	141	265	459	38	38	59	6,909
Total	41,577	2,865	665	3,861	110	520	235	33,322
CHANGE EXPERIMENT - BASE	TOTAL exports	of which to:						
		EU27	ACP sugar protocol countries	EBA (non ACP) countries	Brazil	Sugar dev countries no prefs	Thailand & Australia	All other countries
European Union 27	44	0	0	36	0	0	0	7
ACP SP countries	4	0	0	3	0	0	0	0
EBA (non-ACP) countries	343	384	-2	-15	-1	-2	0	-20
Brazil	40	0	0	34	0	0	0	6
Sugar dev. countries with no preferences	33	0	0	38	0	0	0	-5
Thailand & Australia	4	0	0	5	0	0	0	-1
All other countries	22	0	0	18	0	0	0	4
Total	490	384	-1	118	0	-1	0	-9

The income effects of this scenario are decomposed in table 4.2 into effects of eliminating sugar tariffs and eliminating non-sugar tariffs for EBA countries. The EBA countries as a group would gain USD443 million in this experiment; the largest part of USD354 million is due to the elimination of non-sugar trade barriers. Although the additional sugar export revenues are substantial, and the export growth leads to rising factor returns in agriculture, the share of sugar in the EBA economy is too low (about 10% of GDP) to boost the EBA economies. Hence, potential allocation gains from liberalisation of non-sugar sectors are much higher. Note also that the unilateral policy change towards the EBA countries also leads to some losses in other developing countries, due to trade diversion effects.

Table 4.2 Decomposition of national income effects, EBA scenario

National income million USD	Base 2001	Sugar effect	Non-sugar effect	Total
European Union 27	8344,291	-465	-389	-854
ACP sugar protocol countries	185,490	0	-2	-1
EBA (non-ACP) countries	363,799	89	354	443
Brazil	502,503	1	-7	-6
Sugar dev countries no prefs	629,987	-1	-12	-13
Thailand &Australia	472,046	2	1	3
All other countries	20780,518	-16	-71	-87
Total	31278,634	-390	-126	-515

Source: LEI, own calculations.

EU scenario

This is a substantially more complex scenario than the previous EBA experiment. The intricate interaction between domestic reforms and trade reforms leads to various production and trade responses. The European Commission proposes to reduce sugar reference prices, which will also lead to a drop in market prices. This lower EU price makes it less attractive for other suppliers to import into the EU market, but as long as the EU price remains (substantially) above their marginal cost it will still be necessary to control trade in order to prevent a large influx of sugar. This is exactly what the EU proposal attempts to achieve: just free market access for EBA and a limited rise of import quota for Balkan countries.

At the same time, the EU attempts to reduce domestic sugar production by constraining sugar beet production through a tightening of beet quota by 16%, or 2.8 million tonnes of white sugar. Part of that lower domestic production should lead to lower (subsidized) exports from the EU and a part can potentially be covered from LDC (i.e. EBA) imports.

A 37% drop of EU exports to 4.2 million tonnes accommodates EU's production cut. (The year 2000 WTO bound for the EU15 is 1.3 million tonnes of subsidised sugar exports). On the import side, we observe additional imports of 211,000 tonnes (see Table 4.3). These additional imports stem from EBA countries (196,000), the Balkan countries (Croatia and Serbia, included in 'All other countries') import additional 15,000 tonnes to the EU markets. As in the previous EBA experiment the additional export from EBA countries to the EU is partly made possible by 'triangular' trade: sugar from Brazil and other countries is channelled through LDCs with preferential import opportunities into the EU market. The own sugar production in EBA countries expands by just 2.4%, to 3.1 million tonnes (see table 4.5).

In this experiment, all other potential importers to the EU are restricted in their trade through the remaining import barriers, although the value of their quota rents are reduced by the drop in EU prices. Despite the reduction of intervention prices in the EU, the market thus remains attractive for low-cost LDC sugar suppliers.

Table 4.3 Bilateral trade effects of the EU reform scenario (in 1,000 tonnes)

EU	TOTAL exports	of which to:						
		EU27	ACP sugar protocol countries	EBA (non-ACP) countries	Brazil	Sugar dev countries no prefs	Thailand & Australia	All other countries
European Union 27	4162	0	66	564	42	95	112	3,283
ACP SP countries	2291	1,574	57	79	0	184	0	397
EBA (non-ACP) countries	1057	257	26	446	9	35	0	283
Brazil	11330	656	39	865	0	55	0	9,715
Sugar dev. countries with no preferences	5459	50	103	1,008	0	59	5	4,233
Thailand &Australia	6998	0	71	118	0	5	0	6,804
All other countries	8020	155	268	462	40	38	63	6,994
Total	39317	2,692	629	3,543	90	473	180	31,709
CHANGE Experiment - BASE	TOTAL exports	of which to:						
		EU 27	ACP sugar protocol countries	EBA (non-ACP) countries	Brazil	Sugar dev countries no prefs	Thailand & Australia	All other countries
European Union 27	-2,425	0	-41	-310	-22	-54	-59	-1,939
ACP SP countries	12	0	1	4	0	4	0	4
EBA (non-ACP) countries	184	196	-1	-1	0	-1	0	-10
Brazil	162	0	0	39	0	1	0	121
Sugar dev. countries with no preferences	75	0	1	43	0	1	0	30
Thailand &Australia	89	0	1	5	0	0	0	83
All other countries	134	15	3	21	2	1	4	89
Total	-1,771	211	-36	-199	-20	-49	-54	-1,622

Figure 4.1 illustrates the worldwide changes in sugar output under the two scenarios. While the EU output contracts only under the EU reform proposal, as quota are shrinking, the EBA sugar output shows the strongest growth under an unreformed EU sugar regime. Once the EU engages in reforms, price drops in the EU and in their wake reduced export subsidies make the EU a less attractive market.

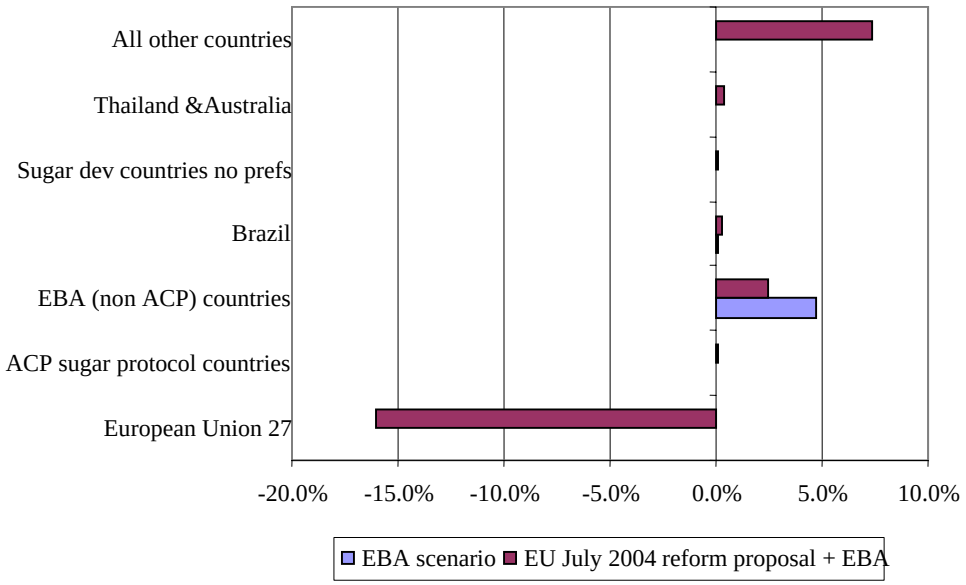


Figure 4.1 Output effects, per cent change relative to base 2001

Income effects are a bit less, but positive for the group of EBA countries as a whole. This EU reform scenario also indicates stronger trade diversion effects than the EBA scenario. The reduced EU output opens the possibility for more imports, but only from (low-cost) EBA countries; other suppliers - also ACP SP countries - seize the 'triangular' trade opportunities, and are hence able to compensate for the loss of export revenues in the face of declining EU prices.

Table 4.4 Decomposition of national income effects, EU reform scenario

National income million USD (a)	Simulation Base 2001	EBA sugar import effect	EBA non-sugar effect	EU domestic sugar policy effect	Total
European Union 27	8344,291	-463	-145	5,255	4,647
ACP sugar protocol countries	185,490	1	-2	1	-1
EBA (non-ACP) countries	363,799	103	307	-28	382
Brazil	502,503	-1	-7	-16	-24
Sugar dev countries no prefs	629,987	-1	-12	4	-9
Thailand &Australia	472,046	-16	-44	77	17
All other countries	20780,518	-5	-5	108	98
Total	31278,634	-381	92	5,401	5,112

a) Measured from Equivalent Variation
Source: LEI, own calculations.

Table 4.4 decomposes the national income effects. It is noteworthy that the income loss for the EU under the EBA scenario is turned into a gain once the EU rationalises its

policy. The effect of domestic reforms on EU welfare is significant, and stems from three main sources: (1) lower prices for EU sugar imply lower cost for sugar using industries and consumers; (2) the contraction of the sugar sector reduces deadweight losses in the form of rents associated with the current policy regime; (3) reduced expenditures on export subsidies. Note, however, that the sugar reform by itself entails small income losses to Brazil and EBA countries. This is due to the fact that they receive a lower price for their exports. At the same time Thailand and Australia are able to channel increased amounts of sugar through Balkan countries, that receive new import opportunities to the protected EU market, leading to small positive policy spill-over effects for them.

Table 4.5 below summarises the results of the base and the two simulation scenarios.

Table 4.5 Summary of simulation results (tonnes x 1,000 in raw sugar equivalent)

	Base 2001	EBA scenario	EU July 2004 reform proposal + EBA
Exports to EU27			
ACP sugar protocol countries	1,574	1574	1,574
EBA (non-ACP) countries	60	444	257
Brazil a)	656	656	656
Sugar dev countries no prefs	50	50	50
Thailand & Australia	0	0	0
All other countries	141	141	155
Total	2,481	2865	2,692
Export from EU27	6,587	6631	4,162
Output (raw sugar equivalents)			
European Union 27	18,233	18233	15,316
ACP sugar protocol countries	3,428	3428	3,429
EBA (non-ACP) countries	3,023	3165	3,097
Brazil	20,336	20348	20,385
Sugar dev countries no prefs	25,965	25974	25,989
Thailand & Australia	10,139	10139	10,174
All other countries	34,781	34781	37,345
WORLD	115,904	115735	115,735
Income (USD million)	GDP (Base 2001)	Additional national income, EV	
European Union 27	8344,291	-854	4,647
ACP sugar protocol countries	185,490	-1	-1
EBA (non-ACP) countries	363,799	443	382
Brazil	502,503	-6	-24
Sugar dev countries no prefs	629,987	-13	-9
Thailand & Australia	472,046	3	17
All other countries	20780,518	-87	98
WORLD	20780,518	-87	98

a) Brazil exports around 60,000 tonnes to EU-15 and some 600,000 tonnes to Rumania and Bulgaria. The latter two countries are assumed EU member by 2007. We assume that the EU will have to allocate 'current access' quota to Brazil as current exporter to the new member states.
Source: LEI, own calculations

The major conclusions from these experiments are that:

1. Sugar imports from EBA countries increase but there is no dramatic inflow of sugar under the two scenarios simulated. The extra EU imports under the EBA scenario will be 384,000 tonnes, while in the EU reform scenario extra imports will add up to only 211,000 tonnes. These estimates are much less than what the EC indicates in its background notes to the Communication of July 20043. As reported, the EC projects an import increase of around 2.8 million tonnes (from 0.2 million tonnes to around 3.0 million tonnes) from EBA under a status quo scenario, while extra imports from EBA countries would be 500,000 tonnes under the reform scenario;
2. EBA countries achieve positive welfare effects from the elimination of sugar trade barriers, but mainly from the elimination of non-sugar trade barriers. National income of these countries is estimated to increase USD382 million under the EU reform scenario;
3. ACP SP countries are able to compensate for the loss of export revenues in the face of declining EU prices: these countries (as a group) will see a mild growth in sugar export volumes under the July 2004 EU reform proposal, as these countries can export a bit more to other developing countries. However, this does not translate into income gains as prices received decline;
4. Brazil and other developing countries will increase their exports to other developing countries but these amounts are modest. Both Brazil and the group of other developing countries are hardly affected by the EU proposal.

4.2.3 Sensitivity

The relatively modest import flow of LDC sugar into the EU is related to the fact that EU sugar and LDC sugar are imperfect substitutes. Table 4.6 reports on the sensitivity of results with respect to the modelling of the international sugar markets. In the standard version, sugar is an internationally differentiated good: sugar from different sources is imperfectly substitutable and the respective elasticities have been obtained from detailed econometric studies (Hertel et al., 2003). If we leave that assumption and assume instead that sugar is a homogenous good (a perfect substitute), we obtain a dramatically higher rise in EBA exports towards the EU-27. Under the most 'elastic' specification of sugar trade (elasticity of substitution between domestic and imported sources equals 10), imports from EBA countries change by an additional 2.7 million tonnes. There is nothing that prevents such an inflow: EU prices remain high through the intervention price system, and re-exports of EBA sugar (at subsidised prices) is not prevented. Naturally, income effects also multiply under the homogeneity assumption. This simulation indicates the upper limit of possible imports into the EU from EBA suppliers.

Under the EU reform scenario with perfect substitutability the trade effects are dampened and EBA sugar imports rise by 'only' 915,000 tonnes. This is due to lower EU prices, precluding less competitive EBA exporters from increasing their exports to the EU, and it is due to reduced export subsidies, which limits re-exports from the EU-27.

The homogeneity assumption is maintained in most other modelling studies on the sugar market, but it's not very plausible for three reasons. One, the econometric studies, based on long-term historical trends, do not support it. Two, dominant industrial users of

sugar in the EU are likely to insist on high quality refined sugar, as they are accustomed to EU beet sugar processors to supply high quality refined sugar (of 45 ICUMSA, a measure of colour of the sugar crystal) and only a few LDC suppliers are able to supply refined sugar of this grade (LMC, 2004b:13). And three, there is the difference between raw and white sugar in the international trade.

Table 4.6 Summary of sensitivity results

Change relative to base 2001	EBA scenario			EU reform scenario		
	low elasticity sigma = 2.7	medium elasticity sigma = 5	high elasticity sigma =10	low elasticity sigma = 2.7	medium elasticity sigma = 5	high elasticity sigma =10
Change total imports to EU-27, tonnes X 1000	384	1,285	2,717	211	466	915
of which additional imports from EBA countries	384	1,285	2,717	196	452	901
National income, million USD						
ACP sugar protocol countries	-1	0	10	-1	1	4
EBA (non ACP) countries	443	675	1,588	382	478	669
Brazil	-6	-3	16	-24	-17	-13
Sugar dev countries no prefs	-13	-12	10	-9	-8	-4

Note: Sigma indicates the elasticity of substitution between domestic and imported sources for sugar.

The model's database allows detail up to 87 countries and/or regions (see appendix 4). Therefore, results from these model simulations are not very detailed for individual countries and hence, it is not known which countries may benefit (most) from the increased market access to the Union and who would lose (most). In the following chapters we provide more detail about the consequences of the EU reform proposals for individual developing countries, based on literature review and country case studies.

5. Consequences of EU sugar policy reforms for developing countries: literature review

5.1 Introduction

The impact of the EU's sugar trade policy on international markets has received much attention ever since the early years of its establishment (see, e.g. Abbott, 1990 for an overview). In the preparatory stage of the GATT Uruguay Round negotiations - in the 1980s - and during the negotiations, many studies on the impact of global trade liberalisation on international agricultural markets have estimated the consequences of EU sugar trade policy for international trade positions, including those of several groups of developing countries.[1] This chapter focuses on the possible consequences of the most recent EU policy reform proposals for the group of developing countries. LMC has done several in-depth studies to indicate the possible impacts of changes in the EU policy on ACP and LDC sugar suppliers.[2] These studies are reviewed, commented on and supplemented with other relevant literature.

5.2 EU imports from developing countries after reform

LMC has released several studies estimating the possible impact of EU sugar policy reforms on ACP and LDC sugar suppliers (LMC, 2002; 2004a; 2004b). In its 2002 report, LMC estimates the effects by assuming a number of scenarios with respect to EU sugar price falls, import tariff and export subsidy reductions (see table 5.1). LMC estimates the possible future third country supply of sugar to the EU under the Sugar protocol, the MFN and the EBA access arrangements. The outcomes are summarised in table 4.1 below. This table reveals total imports of between 1.5 million tonnes and 3.4 million tonnes depending on the magnitude of price cuts in the EU: the lower the EU price, the less attractive the EU market and the less imports from developing countries.

Table 5.1 reveals that LMC assumes no change in the level of imports under the Sugar Protocol or MFN access arrangements. This is despite the fact that several ACP countries are unlikely to be able to cover their cash (i.e. variable) costs of production, even when the price cuts in the EU would be modest. Given the uncertainty surrounding post-Lomé access arrangements, LMC has assumed very straightforward that any quota shortfalls from one country will in some way be reallocated to other, low cost countries. According to its estimations, low cost countries in the ACP group would be able to fill the quota even under the most extreme price cut of 33%.

[1] To mention just a few: Valdès and Zietz, 1980; Tyers and Anderson, 1986; Sturgiss et al, 1987; Parikh et al., 1988; Roningen and Dixit, 1990

[2] LMC, 2002; LMC, 2004a; LMC, 2004b.

Table 5.1 Third country imports to EU in 2010/11 under different scenarios

Assumptions				
Fall in intervention price 2001/02 to 2010/11				
- In %	7	22	17	33
- White sugar intervention price	589	492	522	425
- Raw sugar intervention price	489	408	433	352
Third country imports to EU ('000 tonnes, white sugar equivalent)				
Protocol	1,315	1,315	1,315	1,315
MFN	79	79	79	79
EBA	2,025	592	784	112
Total	3,418	1,985	2,177	1,505

Source: LMC, 2002:143, table A4.1 and table A4.5.

LMC projections indicate an increase in EBA sugar supply to the EU market. The EBA supply to the EU is projected to increase for three reasons, namely:

1. diversion of current world market exports to the EU market; this amount is estimated around 130,000 tonnes and will largely come from Sudan and Ethiopia;
2. diversion of domestic sales to the EU (and meet domestic consumption through imports); on the basis of average world market sugar prices, this amount could exceed 1.0 million tonnes as long as EU sugar prices fall by just 7% (this implies a raw sugar intervention price of €489/ton, see LMC, 2002:151). If price differentials (between EU price and import price of world market sugar to domestic market) diminish, opportunities for LDCs to exploit arbitrage disappear; price cuts of 17% or more are likely to deter this trade. However, at very low levels of the world price this trade could continue even if prices in the EU are cut by 33%. This makes it very difficult to project import levels from one year to the next;
3. expansion of domestic sugar output - this could exceed 1.0 million tonnes depending on the extent to which prices are cut in the EU. This increase is likely to come from just six low cost LDCs: Sudan, Ethiopia, Malawi, Mozambique, Senegal and Zambia. Under a 33% price cut, the countries that could be expected to expand their supply to the EU are Sudan, Ethiopia, Mozambique and Zambia. However, the imports into the EU under such a scenario is very modest. This conclusion is very similar to our conclusion in the previous chapter.

5.3 Cost of production in developing countries

Important element in the analysis of identifying which third countries would have a realistic chance of adapting to the changes in the EU market access conditions is the current and future cost of production. Sugar production costs in each ACP and EBA country are derived using LMC's cane sugar production cost model, which estimated the cost of growing sugar cane (including transport to the mill) and the cost of processing sugar cane to produce raw sugar, on a bulk ex-factory basis. Figure 5.1 presents the present (2000/2001) EU third country suppliers subject to ACP SP and EBA agreements according to three cost categories.

Low (full) cost (< €300/ton)	Medium (full) cost (€301-500/ton)	High (full) cost (> €501/ton)
ACP SP country: Malawi, Swaziland, Zambia b), Zimbabwe; *EBA producers*: Ethiopia, Sudan	*ACP SP country*: Belize, Congo, Cote d'Ivoire, Fiji, Guyana, Mauritius, Tanzania *EBA producers*: Burkina Faso, Mozambique	*ACP SP country*: Barbados, Jamaica, Madagascar, St. Kits, Trinidad.

Figure 5.1 Cost of production in EU sugar suppliers from ACP SP signatories and LDCs a)
a) ACP SP signatories that are LDCs too and thus may benefit from the EBA agreement are: Congo, Madagascar, Malawi, Tanzania and Zambia; b) Zambia has a EU export quota under the SPS agreement and a zero quota under the SP agreement.
Source: LMC, 2002: 145, Table A4.2[1].

Next to production costs, the price for which the sugar can be offered at the EU border should also cover costs for transport and duties. For most countries costs for freight and fobbing plus duty range between €50 and €100 per ton. For some countries this is higher: for instance, Brazil and Cuba pay €98/ton MFN duty plus €50-60 per ton transport costs. Some landlocked countries experience particularly high transport costs. Examples are Zambia and Malawi, two low cost production countries, but landlocked and therefore they face high trade costs estimated €135/ton and €112/ton respectively (LMC, 2002:145).

LMC projected costs of production in EU sugar suppliers from 2009/10 are based on an analysis and judgment of productivity increases and cost developments (LMC, 2002:150). Figure 5.2 present countries with costs of production including costs of transport and duty that would be lower than the raw sugar price in the EU of €329/ton, that implies from the reduction of the guaranteed price for white sugar (CEC, 2004a:9-10). Countries with supplying prices up to €450/ton are also included in the table. The sugar industries in the eight low-cost production countries seem to have the most favourable perspectives to gain from the expected changes in the EU sugar trade regime. To what extent that might be possible, is discussed in the following sections.

Full cost of production CIF duty paid < EU intervention price of €329/ton raw sugar	Full costs of production CIF duty paid between €329/ton and 450/ton
ACP countries: Fiji, Malawi, Swaziland, Zambia and Zimbabwe	ACP countries: Belize, Guyana,
EBA countries: Ethiopia, Mozambique, Sudan	EBA countries: Senegal

Figure 5.2 Projected costs of supplying raw sugar by country in 2009/10 (EUR/ton)
Source: LMC, 2002: 150, Table A4.4.

[1] LMC differentiates between cash and non-cash costs (for the field and factory sector). Cash costs are variable costs including costs of labour, fuel, fertilisers, seeds and chemicals, repairs and maintenance, and administration. Non-cash costs of production are depreciation and return on capital. Full costs include both cash and non-cash production costs.

5.4 Potential levels of sugar production in developing countries

The Commission's July 2004 proposal to reform the Union's sugar policy implies a price reduction for raw sugar to €329/ton. Assuming that ACP exporters will receive this price at the EU-border (while they also have to cover the costs of insurance and freight by this price), many ACP sugar industries currently exporting to the EU under the ACP/EU Sugar Protocol will face a loss in their exports to the EU market. Some countries, such as Barbados, Jamaica, Madagascar, St. Kits, Trinidad - the high cost producers - would have to cease exports to the EU and, consequently have to fear that their sugar industries will collapse as costs are so high that restructuring of the industry makes no sense (see also box 5.1 in section 5.6). LMC assumes that the total SP quota (1.3 million tonnes in white sugar equivalents) will remain in the new arrangements under EBA with ACP countries and that quota shortfalls from one country will be reallocated to other lower cost ACP countries. This implies that the lower cost ACP countries would fill the full SP quota, most notably the five countries with the lowest estimated costs - Fiji, Malawi, Swaziland, Zambia and Zimbabwe. These five countries normally produce 1.925 million tonnes sugar per annum (ISO, 2004) and have currently a SP export quota of 335,000 tonnes (26% of ACP quota under SP).

In order to replace exports from high-cost ACP countries that are part of the SP, the five above-mentioned low cost ACP countries have to expand their production of almost 2 million tonnes with an additional one million tonnes. LMC assumes that the future EU market price would be attractive enough to encourage such significant production increases in the low-cost countries. However, this may appear rather optimistic as the projected export (EU import c.i.f.) prices for Fiji, Malawi, Swaziland and Zambia will be about the same as the EU intervention price for raw sugar (LMC, 2002:150); for these countries the opportunity to export sugar to the Union may not trigger extra production as the financial gains are (too) low. The industry in these countries may invest in efficiency improvements and cost reduction measures, or expand and benefit from scale economies. Yet, uncertainties around prices - will EU price level remain or will it drop further due to WTO or other developments? - makes the industry reluctant to invest. Only in Zimbabwe raw sugar production costs for 2010 are projected far below EU intervention price, namely €230/ton (LMC, 2002:150). Consequently, Zimbabwe's sugar sector may benefit greatly from the EU sugar reform implying a 33% price reduction. Zimbabwe's normal production level is around 600,000 tonnes per annum (ISO, 2004). Being the ACP SP signatory with the lowest production costs, Zimbabwe would be the country to fill a large part of the SP quota, when inefficient suppliers have to cease their exports to the Union. For this Zimbabwe's sugar industry needs significant investment in expansion. Yet, the present political situation in the country is not very favourable to investments.

Non-ACP LDCs may benefit from unlimited access under the EBA initiative, but also have to cope with the EU price reductions. The low cost EBA countries - Ethiopia, Mozambique and Sudan - normally produce around 1.15 million tonnes (mainly in Sudan [700,000 tonnes] and Ethiopia [300,000 tonnes]). The opportunity to export to the EU will stimulate sugar production in these countries, but to what extent depends on the EU price cut. According to LMC's initial estimates, a 33% EU price cut will result in 240,000 tonnes extra that the EBA countries will be able to ship to the EU in 2010/11. Furthermore, in its

2004 report LMC indicates that once investments in sugar production expansion have been made in these countries, supply to the EU market may increase to levels between 0.6 and 1.0 million tonnes in 2015 (LMC, 2004b: 49). This again assumes that investments in the sugar sector in these countries will occur. Besides domestic factors affecting potential investments in the sector - capital availability, opportunity costs, general investment climate, etc. - potential investors may be deterred by the Commission's call for an evaluation of the EBA agreement in 2008, which may lead to a review of price levels. This uncertainty is likely to reduce the propensity of investors to invest their money in expanding the sugar industry in LDCs.

Will other countries benefit from increased access to EU markets, due to the price and import tariff reductions projected? Brazil is often considered as the most competitive sugar exporter in the world. According to LMC projections for 2009/10, Brazil may produce raw sugar in the northwest region of the country against EUR 271/ton (full) production costs. Even if as a result of a new WTO agreement tariffs would be reduced by another 36% (same as in the URAA), import tariffs would be too high to compete with countries, which have free access to the EU market. There is, however, an other way for Brazil to enter the EU-market and that through the EU member states to be, Rumania and Bulgaria. As explained in section 3.3, Brazil (and Cuba) has been compensated under WTO rules for the loss of access to Finland that joined the EU common market in 1995. Following the MFN import precedent, the EU will have to allocate 'current access' quota to Brazil as current exporter to Bulgaria and Rumania (of some 600,000 tonnes in 2003), based on historical access.

5.5 Trade diversion

Next to the direct impact on trade flows between developing countries on the one hand and the EU on the other, the changes in the EU trade regime may have impact on trade through trade diversion: there could be significant scope for arbitrage business between non-LDC low cost sugar producers (e.g. Brazil, Thailand, Australia) and EBA countries, as well as between surplus sugar producing non-LDCs that could divert their world market sugar exports to EBA beneficiaries.

In the first case, an EBA country may profit from arbitrage by selling its production to the EU market and purchasing lower priced world market sugar (from Brazil or Thailand) for domestic purpose. The profit is the difference between the two prices minus the trading (importing and exporting transactions) costs. Assuming an average world market price of USD350/ton white sugar, LMC shows that most arbitrage operations will lose their interest if the EU sugar price is cut by 33%. However, as the world market price is very volatile, arbitrage may be profitable from year to year, even under this 33% price cut. For example, in an interview traders revealed that the world market price for sugar ranged between USD160-200/ton at the end of 2004. [1] At such low prices arbitrage would be profitable, even for countries with relatively high trade costs. Moreover, also the dollar-

[1] Meeting with LDC Sugar Group, 26-11-2004. A price range of USD160-200/ton equals €125-155/ton in December 2004 (1 € = 1.3 USD).

euro exchange rate is important: when the dollar loses value against the euro (as it did since 2002), the world market price in euro terms declines even at a constant dollar price. Thus, assuming everything else equal, exchange rate variations also have an impact on arbitrage trade and the extent it may occur. The potential for arbitrage is therefore very uncertain. In the most dramatic case - i.e. that all sugar production from LDCs would be exported to the EU, LMC estimates an inflow of 4.7-6.2 million tonnes (LMC, 2004b: 41).

Similar magnitudes of trade volumes fuelled by arbitrage are claimed by ASSUC - the Association of Sugar Traders in the EU. ASSUC (2001) points at considerable scope for the LDC's to substitute domestic sales with world market sugars and to export own produced sugar to the EU market. The Traders claim that infrastructure to move sugar to suitable ports is available and, just as importantly, it is easy to reverse this flow to allow (cheaper) imports of sugar (significantly reducing the overall per unit costs). Further potential substitution is likely, ASSUC claims, given the planned increases in capacity in certain countries. ASSUC estimates that capacity utilisation amounts to 2.4 million tonnes in 2002/1, yet that production given full and planned capacity utilisation would amount to 4.3 million tonnes. Indicating that total consumption is around 3.7 million tonnes, these figures imply that supply to EU markets under free access could be 0.6 million tonnes at minimum (assuming no diversion of domestic sales to the EU) to 4.3 million tonnes maximum (assuming all production will be sold at EU markets and imports meet domestic consumption). Especially in Mozambique and Sudan capacity is much larger than actual production, according to ASSUC.

LMC illustrates the second option of arbitrage indicated in the first paragraph of this section by discussing the impact of five free trade areas on the African continent (2002: 161-174). LMC's analysis suggest that if free trade in sugar within each of the regions is assumed, arbitrage would become profitable for many countries at long run average world sugar prices even with price cuts in the EU up to 22%. However, this analysis is based on the assumption that non-LDCs would be willing to supply sugar to their neighbouring country at the world sugar price. In theory, this would be the case if the country was a surplus sugar producer and the only other outlet for their sugar was the world market. Given that most national sugar industries are supported by levels of at USD400-500 per ton, intra-FTA trade between non-LDCs and LDCs will only tend to enhance this arbitrage if one or more of the non-LDC members is a large exporter of sugar to the world market. The only country in the African region that complies with these features is South Africa, who is member of SADC (Southern African Development Community). However, sugar is treated a sensitive product within SADC and free trade is not envisaged this decade. Therefore, LMC concludes that 'the scope for intra-FTA trade to boost the volume of sales to the EU is non-existent' (LMC, 2002:168).

5.6 Winners and losers

Obviously, ACP SP countries will lose from the EU sugar trade reform, as they will receive lower prices than before for their sugar exported to the Union, which implies lower export revenues, lower income and declining employment. The EU has stated that it is willing to continue to guarantee the volume of sugar imports outlined in the Lomé Agree-

ment at 1.3 million tonnes, but it will only buy these exports at the new (lower) intervention price. It is clear from the previous sections that only a few countries will be able to export to the EU market when prices are reduced to reach the level of €329/ton raw sugar/€421/ton white sugar. Such a low price will not cover sugar production costs in the ACP Sugar Protocol countries but Zimbabwe. Ethiopia, Sudan and Mozambique are non-ACP LDCs with low production costs and are expected to benefit from the EBA agreement providing unrestricted access to the EU sugar market after 2009. Other ACP Sugar Protocol countries will lose when the present EU proposal on sugar policy reform is accepted, unless they can benefit from arbitrage. As indicated above, arbitrage is difficult to project, subject to world market price and exchange rate fluctuations. For instance, at December 2004 world market prices arbitrage would have been attractive to many countries if they would have free access to the EU sugar market, even at the 'low' price of €329/ton raw sugar. Countries that can deliver sugar at the prevailing low world market prices - Brazil, Thailand, Australia - will benefit from such arbitrage opportunities.

Within the group of ACP countries that will lose because of the changes in the EU sugar trade regime, there are great differences in terms of lost export revenues and subsequent impact on the economies of these countries. Milner et al. (2004) show this by estimating income transfer to ACP sugar protocol exporters associated with the prevailing regime for 2001. This income transfer is estimated at USD490 million (export volume to the EU times difference between EU and international ISA price), of which Mauritius receives by far the largest share (36.9%). Mauritius, plus Fiji, Guyana, Jamaica and Swaziland receive about 80% of the total transfer as these countries have a relative high share of the total SP quota. Furthermore, sugar production in these countries is quite heavily export-oriented and some export largely to the EU (see table 5.2). This concentration indicates that any EU sugar reform, which lowers the EU import price to the ACP protocol exporters, is likely to have very uneven adjustment implications across the countries involved. Moreover, in terms of percentage of GDP income transfers show to be most important for Belize (1.9%), Fiji (2.9%), Guyana (8.7%), Mauritius (4.0%) and Swaziland (4.3%) (Milner et al., 2004:797).

For a more complete impact analysis of the proposed EU sugar trade reform, Milner et al., take into account the impact of such a change on international prices. Studies on this topic differ widely in approach and effect on international prices. Milner et al., consider an intermediate value (of studies they review) of 38% undervaluation of the world sugar price relative to the fully liberated world market price. This would in turn correspond to a 48% fall in the EU intervention price in order to equalize EU and world price. By taking into account the assumed change in world market price, the figures of the first calculations are affected downward; since, part of the gross transfers directly associated with export income on sugar exports to the EU is inflated by the too low set world market price and indirect effects on the non-EU export earnings are ignored. The revised estimate of the gross transfer is consistently lower than the earlier estimates (USD377.2 million). The particular interesting difference in these estimates is the variation in the sign on the net transfers. There are now five countries for which the current net income transfer is nega-

tive, namely Congo, Cote d'Ivoire, St. Kitts, Zambia and Zimbabwe. [1] These are countries - mainly low-income African countries - that are potential gainers from sugar liberalisation.[2] On the other hand, Mauritius, Fiji, Guyana and Jamaica account for over 80% of the total net transfer and would gain most from a status quo.

Table 5.2 ACP SP and SPS sugar quotas, production, export orientation and dependency on EU market (tonnes w.s.e.) a) b)

Countries	SP quota allocation 2003/04	SPS quota allocation 2002/03	Production average 2001/03	Exports average 2001/03	Exports as share of prod. (%)	Exports to EU average 2001/03	Exports to EU as share of total exports (%)
Barbados c)	32,097	0	40,000	39,000	98	39,000	100
Belize	40,349	5,527	105,000	92,000	88	47,000	51
Congo e)	10,186	2,249	41,000	34,000	83	6,000	18
Cote d'Ivoire	10,186	9,704	144,000	32,000	22	20,000	63
Fiji	165,348	21,060	304,000	248,000	82	151,000	61
Guyana	159,410	17,111	282,000	244,000	87	180,000	74
Jamaica c)	118,696	18,894	164,000	131,000	80	131,000	100
Kenya	5,000	10,908	418,000	8,000	2	8,000	100
Madagascar c) e)	10,760	0	36,000	9,000	25	8,000	89
Malawi d) e)	20,824	9,897	222,000	83,000	37	49,000	59
Mauritius	491.031	21,266	545,000	540,000	99	490,000	91
Mozambique e)	6,000	0	140,000	51,000	36	9,000	18
St. Kitts c)	15,591	0	19,000	15,000	79	5,000	33
Swaziland d)	117,845	45,030	569,000	456,000	80	146,000	32
Tanzania e)	10,186	2,183	159,000	18,000	11	18,000	100
Trinidad c)	43,751	5,658	82,000	55,000	67	44,000	80
Zambia d) e)	7,215	12,863	203,000	108,000	53	21,000	19
Zimbabwe d)	30,225	29,948	489,000	172,000	35	49,000	28
Total	*1,294,700*	*217,298*	*3,962,000*	*2,335,000*	*59*	*1,534,000*	*68*

a) Surinam and Uganda are part of the SP but have no sugar quota agreed with the EU; b) Rounded figures; c) Countries with high production costs (> €500/tonne); d) Countries with low production costs (< €300/tonne); e) Least Developed Country. Sources: www.acpsugar.org for sugar quota; ISO 2004, Yearbook 2003 for production and export figures.

The Milner et al., study shows that, if the current transfer is measured for a prospective rather than actual world price, the cross-country pattern of gainers and losers from the current EU sugar regime is more obvious, and that not all protocol countries necessarily have strong incentive for the protection of the benefits they gained under the Sugar Protocol. However, the study can be criticised on several grounds. The study has only looked at ACP countries and admits that, with full implementation of the EBA arrangement, the least

[1] It is very strange to have St. Kitts in the group of potential beneficiaries of liberalisation. LMC estimates relatively high sugar production costs in that country and labels the country as one of the losers of EU policy reform. Furthermore, St. Kitts has not been able to export sugar to the EU in 2001, the year used in Milner et al. calculations, while ISO does not report sugar exports to other countries.

[2] If world market price would increase less than the assumed 38%, the number of countries with negative net transfers will tend to decrease. Milner et al. indicates that increases up to 20% would leave only Congo, St. Kitts and Zambia with negative transfers (and thus would benefit from liberalisation).

developed protocol countries would face a more complex balance of interest between higher world prices from EU liberalisation and higher EU prices through the EU not liberalising. Furthermore, Milner et al., probably estimate the world market price effect of these changes much too high, because of two reasons. The present stocks have accumulated to almost half the sugar use in the world (OECD, 2005:10). Moreover, production potentials in Brazil, Thailand and some other developing countries are enormous, which implies that these countries can probably rather easily take over markets left by the EU. This would mean that the impact of EU reforms on international sugar prices is probably small and that longer-term world prices are actually driven down. Another critical remark on this study is that the analysis shows the impact on the sugar industry but does not indicate to what extent the economies might be able to adjust.

Potential welfare losses may be dampened if a country is able to diversify its economy and if capital and labour find remunerative alternative uses. LMC makes several calculations showing the potential welfare loss in terms of industry and export revenues, employment and government budget for ACP countries (LMC, 2004a) and LDCs (LMC, 2004b). LMC shows that the countries most affected will be the high cost producers in the Caribbean region, which are Barbados, Jamaica, St. Kitts and Trinidad (see also box 5.1). At present these countries together have ACP Sugar Protocol export quota of 220,000 tonnes of raw sugar, representing export earnings of €115 million (against EU 2003/2004). And although sugar does not command macroeconomic importance in the Caribbean that it once did, it still represents an important contributor to national levels and livelihoods. At the same time, however, a quick scan of the economies indicates that there are alternative industries (oil, tourism, financial services) in the countries, which may absorb at least some of those displaced by the closure of the sugar industry (see also LMC, 2004a:52). However, also these LMC analyses lack the general economic framework necessary to indicate the macroeconomic implications of the policy.

A reform of the EU sugar regime would have major implications for the Caribbean members of the ACP Sugar Protocol. Currently, the four Caribbean islands Barbados, Jamaica, St. Kitts and Trinidad & Tobago possess 16% of the SP quota. Jamaica has the largest quota (118,696 tonnes), while Barbados (32,097 tonnes), St. Kitts (15,591 tonnes) and Trinidad and Tobago (43,751 tonnes) have smaller quotas.a) Next to these four ACP countries, a fifth Caribbean island, Haiti has duty- and quota-free access to the European sugar market from 2009. However, this LDC is already a net-importer and no further investment in the Haitian sugar industry is expected (LMC, 2004a: 55). Two other Caribbean countries, Belize (40,349 tonnes) and Guyana (159,410 tonnes) also export sugar under the ACP Sugar Protocol.

Sugar production costs in the Caribbean Islands (and in Madagascar) are the highest within the ACP sugar group and future prospects show the same picture (LMC, 2004a: 11-12). Dependency on the European market for sugar exports is relatively high in the Caribbean, compared to the other SP members: 420,000 tonnes out of total CARICOM sugar production of 710,000 tonnes is exported to the EU under the two ACP agreements (McDonald, 2004). Further, sugar is especially important for the economies of Belize and St. Kitts (in terms of GDP and export earnings) while Barbados and St. Kitts use a large share of their agricultural land for sugarcane cultivation (LMC, 2003: 48-49). The sugar industry on the Caribbean islands as well as in Belize is expected to go through major restructuring, following preference erosion due to EU reform. Even a relatively modest EU price reduction of 17% will force the sugar industries on the four islands to cease production. Belize is expected to stop production when the price will be reduced by 38%, while Guyana may keep its sugar industry, but will be forced to rationalise with further price cuts (LMC, 2004a: 25).

Economic implications (loss of industry revenue, loss of foreign exchange earnings and loss of jobs) of a EU reform will be significant. Jamaica and Guyana will experience significant net losses, estimated more than USD25 million, due to their relatively high quotas (Milner et al., 2004: 805). Total industry revenue losses will be €181 million annually for the four islands. Belize may lose €38 million, while revenue losses in Guyana depend largely on the reform scenario implied (LMC, 2004a: 29). LMC predicts that under certain reform scenarios (fixed quotas and price reduction with unlimited access), the industry revenue of the Guyanese sugar industry may rise due to expansion, resulting in higher sales to regional and world markets. Due to the labour intensive character of Caribbean sugar production the consequences of EU policy reforms for employment levels will be significant. The total loss of jobs on the four islands will be 58,000, irrespective of the chosen reform scenario (LMC, 2004a: 32-33). Belize may eventually lose slightly more than 10,000 jobs, while employment levels in Guyana (currently almost 24,000 jobs) depend on the chosen reform scenario. ACP spokesman McDonald estimated that the sugar industry in CARICOM generates 125,000 direct and indirect jobs (McDonald, 2004: 4).

Barbados, St. Kitts and Trinidad are relatively rich countries, compared to the majority of the African members of the SP, but their vulnerability originates in their agricultural mono-economy. There are few agricultural alternatives to sugarcane cultivation and the majority of workers in the agricultural sector is employed in the sugar industry (Laurent, 2004:3). LMC (2004a) recommends the four Caribbean islands and Belize to focus on diversification of the sugar industry and eventually on an exit strategy. However, sugarcane is the only crop that can withstand the hurricanes that frequently ravage the Caribbean islands. Alternative crops - bananas, coffee and vegetables - were all destroyed by hurricane Ivan in September 2004, but sugarcane was resilient.

The most important problem for the Caribbean countries is attracting investors to invest in value-adding activities. For instance, Barbados would like to export higher priced branded sugar to the EU instead of bulk raw sugar, but commercial banks are unwilling to extend long-term loans to the sugar sector. Guyana is currently implementing a USD100 million plan to build an integrated sugar factory, refinery and biogas power plant. Furthermore, the country wants to use an extra 100,000 ha for sugarcane cultivation. At the end of the restructuring process Guyana claims to be able to compete with world market exporters like Australia (Bloomberg, 29 October 2004). However, a drastic price reduction in the EU would mean that Guyana would not be 'bankable' since the restructuring process would be partly financed by high sugar earnings from the Sugar Protocol. Sugar contributes 16% of Guyana's total GDP and it is the backbone of the Guyanese economy (LMC, 2004a:67).

As regards EU assistance to the countries' adjustment processes, the Caribbean countries seem suspicious, because of the disappointing experiences that their banana producers had (Laurent, 2004; Newton, 2004). The ACP countries state that it is important that the EU sets up a competitiveness fund as soon as possible in order to help the sugar industries to prepare for change (Jamaica Observer, 8 December 2004). Laurent argues that the most important lesson from the banana case is the need for a genuine commitment to economic diversification in the Caribbean countries (Laurent, 2004: 5). In this respect Jamaica may prove a difficult case, since the regional importance of sugarcane cultivation is significant and there will probably be strong demands to provide further support to the sugar industry (LMC, 2004a:68). However, to reduce the dependency on preferences and avoid problems on the long term, drastic economic diversification is the only solution.

Box 5.1 Sugar in the Caribbean Community (CARICOM)

a) Barbados used to have a larger quota (50,000 tonnes), but could not fulfil its supply commitment in 2003, due to factory closures and therefore Barbados' quota was reduced.

It is especially the issue of overall welfare implications of the EU sugar trade reforms in developing countries that is generally underexposed: most impact analyses so far are largely partial, focusing on the consequences for the sugar sector only, without taking into account the general welfare implications. Such a broader analysis is necessary to get a full picture of the impact of EU sugar reforms including the consequences of the EBA agreement for non-sugar activities in the LDCs. Such an analysis provides a basis for discussion

about possible financial support to those countries that claim to lose from the changes in the EU sugar trade regime.

In the following chapters, case studies on Ethiopia, Mauritius and Brazil will further complement our earlier findings of and underpin our conclusions about the effects of EU policy changes on developing countries. Conclusions are drawn in the final chapter, synthesising our model calculations, literature review and case study findings.

6. Impact of EU sugar policy reforms on selected third countries: case study Ethiopia[1]

6.1 Introduction

Ethiopia is a least developed country with a population of about 69 million and an annual per capita GDP of about USD90 (OECD, 2004). Agriculture in Ethiopia is the main economic activity, contributing an estimated 45% of GDP with some 84% of the population (approximate 58 million people) earning a living directly or indirectly from agricultural activities (FAO/WFP, 2004). Agricultural production is predominantly in the hands of peasant holdings. The sector is nearly totally dependent on rainfall, while low fertilizer use, susceptibility to pest and disease outbreaks and extensive highland soil erosion have meant high variability in year-to-year agricultural production. Food shortage is a common phenomenon to a large part of the population. The relatively low performance of agriculture in Ethiopia is not the result of just technical constraints: price policies and the institutional environment also play a significant role FAO/WFP, 2004:5, 21-22). Indeed, the volatility of prices for agricultural products could seriously constrain production and adversely affect farm income, particularly when prices collapse in periods of bumper harvest. On the institutional side, the prevailing land tenure system in Ethiopia and the constraints concerning transferability of land rights, coupled with high population growth in the rural areas, will continue to induce disincentives for land investment leading to poor agricultural performance.

Ethiopia's main agricultural products for the national diet are cereals and pulses. Teff, indigenous to Ethiopia, occupies the largest area and has the largest cereal production. Wheat and barley (in the highlands) and corn and sorghum (cultivated mostly at lower altitude) are main staple foods for a large part of the population. Major cash crops are coffee, oilseeds and chat. These products are important agricultural export products of Ethiopia. Sugar is a relatively small cash crop in Ethiopia both in terms of cultivated area and in export revenues. Still, according to the Ministry of Industry in 1998, the share of the sugar industry in food and manufacturing industries were 58 and 10% respectively, while the share in GDP was only 2% (LMC, 2004b:A17).

6.2 Structure of the Ethiopian sugar sector

The Ethiopian sugar production is concentrated in central-Ethiopia, an area with fertile soils and good irrigation facilities. It is regarded as the part of Ethiopia that is most suitable for water-intensive sugar production and Ethiopian sugarcane yields are among the highest in the world, with 11.5 tonnes of sugar per harvested ha (LMC, 2004:9; IF, 2004). Sugarcane cultivation in central-Ethiopia occupies some 24,000 ha (LMC, 2004b). Currently

[1] This chapter benefits from comments and contributions made by Wolde and Asseged (see reference list).

Ethiopia has four state owned sugar factories. The two oldest factories are situated in Wonji and Shoa, while two other factories are located in Metahara and in Finchaa. Wonji is located 100 km and Metahara 200 km southeast of the capital of Addis Ababa. The Finchaa factory started its operations early 1999 and increased national processing capacity with 45% (US Embassy Ethiopia, 1999). All together the four factories produced an annual amount of around 270,000 tonnes of raw sugar in recent years (LMC, 2004b:9).

The factories are owned and supplied by three sugar estates. In addition to the estates and factories the Ethiopian sugar industry owns three confectionery plants producing sweets. All the factories, estates and confectionery plants are currently owned by the Ethiopian Sugar Corporation, a governmental organisation. Each estate has its own Board of Directors, appointed by the government. In 1992 the Ethiopian government started to implement macro-economic policy reforms, under which the privatization of public sector enterprises (UNCTAD, 2002). The Ethiopian sugar industry is still in the hands of the government. The Ethiopian sugar estates provide additional social services to their employees, such as hospitals, schools, housing and recreation facilities (LMC, 2004b:A18). Very few social service alternatives are available under state provision, and moreover these facilities are of higher standard than state facilities.

Large sugarcane cultivation was only introduced in Ethiopia in the 1950s, when the need for sugar as a sweetener became apparent. The introduction of sugar factories in Ethiopia was accompanied by 'large scale mechanised irrigated cane agriculture based on modern agricultural techniques' (Teklemariam, 1991:52). Today, most cane production comes from the estates, although the factories in Wonji and Shoa are also supplied by outgrowers. These are independent farmers who supply their own sugarcane on the basis of a cooperative arrangement. The total estimated number of jobs in the Ethiopian sugar industry is 25,000 (Wolde and Asseged, 2005), including field workers, outgrowers, factory workers and Ethiopia Sugar Industry Support Center staff/30,000 (LMC, 2004b), which makes the sugar industry the main source of employment, with the beverages industry at the second place (AEFJN, 2004).

The Wonji/Shoa outgrowers account for some 1,115 ha of the total cultivated area of 7,020 ha (Wolde and Asseged, 2005). Seven cooperatives / holdings have been established, with an average size of 160 ha. These cooperatives represent some 1,250 outgrowers (8,000 including family members). Sugarcane is the main source of income for these small farms with holdings between one and eight ha, although alternatives are the cultivation of rain-fed crops (wheat, maize, teff, barley, haricot beans, lentils and peas) and grazing of livestock. Nevertheless, sugar is by far the most profitable crop, with an average annual income of ETB13,830 (€1,227) per hectare, which is three to four times higher than income from crop like beans or wheat.[1]

Government policies regarding sugar

The sugar industry is not only state-owned and partly state-managed, the government also has considerable influence on price levels and consumption of sugar. The cane price is set by the government at ETB83.30/ton (€7.40/ton) and domestic consumption was long restricted to stimulate exports and because domestic production was not sufficient. For this

[1] 1,00 Ethiopia Birr = 0.0887162 Euro (www.xe.com) viewed on 04/02/2005.

reason sugar was distributed on the basis of quotas in order to equate supply with demand (Teklemariam, 1991). Such distribution system does not exist anymore (Wolde and Asseged, 2005). Furthermore, the government owns and allocates the rural land and therefore expansion of existing estates and the construction of new estates and factories is regulated by the government. Next to the Ethiopian Sugar Corporation the Ethiopia Sugar Industry Support Centre (ESISC) in Addis Ababa is the most important government organisation. The ESISC deals with all marketing activities, but they lack aggressive marketing strategies and fail to coordinate the activities of the different factories. The factory managers complain about the centralised decision-making structures, which limit their capacities to decide on resources and marketing (IF, 2004).

6.3 Trends in sugar production, domestic demand and exports

Although sources are not fully consistent with each other, the annual production of sugar in Ethiopia is estimated around 300,000 tonnes of raw sugar in recent years (see table 6.1).[1] Sugar production stagnated in the beginning of the 1990s due to civil unrest and severe droughts. Since the mid-1990s production has shown a steep upward trend, while the 1999 surge in production is caused by the establishment of the Finchaa Sugar Factory. Whether this production increase will continue, remains to be seen. One of the uncertainties is the climate, which even plays an important role in the most fertile parts of Ethiopia. However, as will be shown later on, the Ethiopian sugar industry has ambitious expansion plans.

Table 6.1 Ethiopian sugar production 1995-2003

Year	*ISO a)*	*FO Licht b)*	*FAOSTAT c)*
1995	129,322	182,000	139,000
1996	171,917	98,000	182,000
1997	172,217	197,000	186,000
1998	172,571	272,000	197,000
1999	234,709	255,000	272,000
2000	250,869	297,000	255,000
2001	305,000	323,000	297,000
2002	286,898	294,000	294,000
2003	n.a.	296,000	294,000

a) ISO figures from: ISO Sugar Yearbook 2002; b) FO Licht figures from: International Sugar and Sweetener Report, vol. 136, no. 29, 5 October 2004; c) FAOSTAT: http://apps.fao.org/faostat

Ethiopia's domestic sugar market

The Ethiopian sugar production has always primarily been used for domestic consumption; for long the country had to import sugar to cover domestic demand, especially when exports were increasing. Figure 6.1 shows that on average consumption is increasing, but there are considerable annual differences. Consumption per capita is relatively low compared to African standards: 4.0 kg against 13.8 kg in Sudan and 21.8 kg in Kenya (Wolde

[1] An explanation could be found in the use of different calculation methods. The Ethiopian sugar harvest period is between November and June, but when the production is reviewed per calendar year the production statistics may differ from the one based on the harvest period.

and Asseged, 2005). The reasons for this low level of consumption are twofold: high domestic prices and the quota system that used to equate sugar supply with demand. While costs of production are estimated below USD250/ton, domestic prices in Ethiopia are between USD400-475/ton (LMC, 2004b). Therefore, sugar is considered a luxury good in Ethiopia. Consequently, it may be expected that domestic consumption will increase when consumer income rise and quotas to restrict demand are abolished. Current annual domestic consumption is 232,000 tonnes (average 2000-2002) and it is predicted that it will rise with an annual percentage of 7.4% to 530,000 tonnes in 2015 (LMC, 2004b). Sugar sales in Ethiopia are currently made through auction by the factories or the ESISC, representing the estates. The base price is fixed at ETB4,110/ton (€365/ton) ex-factory.

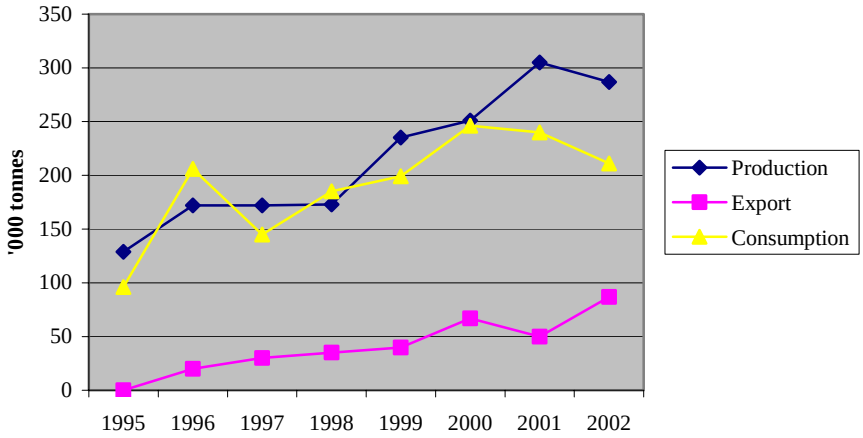


Figure 6.1 Ethiopian sugar production, consumption and export 1995-2002
Source: ISO (2003).

Export and import of sugar

In the previous decades Ethiopia has been a net-importer of sugar in most years but the country has also been able to export around 30,000 tonnes (15% of total production) to neighbouring Djibouti occasionally in the 1980s (Teklemariam, 1991:50). When production levels declined because of civil unrest in the beginning of the 1990s and severe droughts in the mid-1990s, Ethiopia had to import white sugar. These imports came mainly from Brazil (the major supplier), India and Kenya. Next to these countries, the EU supplied white sugar at that time, but the EU exports to Ethiopia have been relatively small. Overall, in the past fifty years, Ethiopia has been able to meet the demands of domestic consumption - mostly because of the implementation of restrictive consumption quotas - and therefore import levels have been low. Ethiopia has imported relatively small amounts of refined sugar in the last fifteen years, ranging from 1,000 to 3,000 tonnes annually (primarily from Sudan and Djibouti).

After the period of drought in 1995-1996, exports resumed in 1996 according to ISO estimates (see figure 6.1). The construction of a new factory in 1999 and the consecutive increase in sugar cane production resulted in Ethiopia becoming a regular exporter of raw sugar with an average net exportable surplus of 49,000 tonnes between 2000 and 2003

(LMC, 2004b). Recent export figures indicate quantities ranging from 50,000 to 80,000 tonnes (according to FAO), or 15-30% of the annual production. These exports went to the EU and to Djibouti, amounting USD20.4 million in 2002 (Ethiopian Export Promotion Agency, 2002; FAO, 2004).[1]

New export opportunities for Ethiopia?

LMC International (2002) has estimated the production costs of sugar in the ACP, MFN and EBA countries. These production costs of raw sugar include cost of growing sugarcane (including transport to the mill) and the cost of processing sugarcane to produce raw sugar. According to these estimated sugar production in Ethiopia has among the lowest costs in the world, with variable costs of raw sugar production estimated to be as low as €75/ton and fixed costs amounting €134/ton. Full (variable plus fixed) production costs are €209/ton. Only Zimbabwe, Sudan and Mozambique are able to produce at lower costs than Ethiopia (as these countries have production costs in the range of €165 - 185/ton). This compares to €250/ton for Brazil (northeast part of the country) - widely seen as the cheapest producer in the world (LMC International, 2002:145). The low production costs should allow the Ethiopian sugar production and export to grow, when market opportunities would occur.

Ethiopia used to have a substantial share of Djibouti's sugar imports, but recently Brazil has considerably gained share in that country's sugar imports. Fortunately, Ethiopia has good trade relations with Djibouti, as it needs its harbour for exporting Ethiopian agricultural products (and other goods) overseas. Trade with Eritrea came to a halt because of the war between the two countries. ISO figures indicate that Eritrea imports its sugar mainly from South Africa. Uganda, although a relatively small country, could serve as another export market for Ethiopia, but again South Africa has taken already the largest part (two-third) of the country's imports. The southern neighbour Kenya also imports its sugar from South Africa (38% of its import needs in 2002). Sudan is not a potential export market for Ethiopian sugar as that country is also a low-cost producer and a net exporter. However, the instable political situation in the southern and western parts of Sudan is not favourable to the Sudanese sugar export. Further, trade with the eastern neighbour Somalia is modest due to the instable political and economic situation in that country. ISO figures show that Brazil accounts for most of the sugar import in Somalia (58% in 2002), while no sugar is bought from Ethiopia. Other potential nearby markets for Ethiopia could be Yemen and Egypt, but according 2002 ISO trade data these countries took near 80% of their import needs from Brazil. Until now, Ethiopia has not benefited much from the fact that its sugar production costs are among the lowest in the world, for Brazil (North and West Africa) and South Africa (South and East Africa) already dominate the African market.

[1] According to ISO the Ethiopian sugar export in 2002 has been entirely diverted to Djibouti. However, in 2002 Ethiopia was also allowed to export sugar to the European Union under the EBA agreement, but the ISO 2002 export figures for Ethiopia do not take these exports to the EU into account, while the ISO records EU import of 15,618 tonnes of Ethiopian raw sugar. This volume has been exported to Portugal for refining.

6.4 Consequences of EU sugar reform for Ethiopia's export opportunities under the EBA agreement

Given the tough competition in the nearby regional African markets, the opening of the EU market for Ethiopian sugar under the EBA agreement is considered to create a significant new outlet for Ethiopian raw sugar. Starting with duty-free imports of around 15,000 tonnes of raw sugar in 2001/2002, the EU has promised to increase that volume by 15% every following year to 41,342 tonnes in 2009, while from July 2009 onwards Ethiopian raw sugar can enter the EU duty-free and without quota restrictions. Because of its low production costs Ethiopia is expected to export increasing volumes of raw sugar to the European Union under the EBA agreement. Projected costs of supplying raw sugar to the EU in 2009 are estimated €287/ton, including freight and fobbing (LMC, 2002:150). With that cost level Ethiopia remains one of the most competitive countries with free access to the EU sugar market.

The Commission's July 2004 proposal to reform the Union's sugar policy includes an intervention price reduction for raw sugar to €329/ton. This will subsequently mean an erosion of preferences under the EBA agreement and in 2009, with an export quota under EBA of 41,342 tonnes, Ethiopia would have €8 million less export revenues than it would have under unchanged EU price conditions. On the other hand, the European reform package also includes the reduction of EU subsidised exports to the Middle East and North Africa, while world sugar prices may rise after EU reform (in the short-run. This may lead to better market opportunities at regional and world markets, although other low-cost producers such as Brazil and Sudan will also try to benefit from those opportunities. Moreover, (some) EBA countries may find increasing opportunities at the EU market as, despite their SP export quota to the Union, inefficient ACP sugar producers will not be able to export to the EU at profitable rates. Ethiopia is believed to be one of the countries that could benefit from this development as an EU intervention price of €329/ton of raw sugar is expected to leave a sufficient margin for the sugar industry, since the production costs of Ethiopian sugar are estimated below USD250/ton (f.o.b.). LMC and Ethiopian experts evaluate Ethiopian export prospects on the European as well as on the regional market positive, but very different.

Clearly the benefits of the EBA agreement depend on the difference between the EU intervention price for raw sugar and the import price (including c.i.f. and duties) of Ethiopian raw sugar, but the key determinant for the development impact of the EBA agreements is the future expansion of the sugar industry. LMC (2002; 2004b:33) explains that the level of investment in the Ethiopian sugar industry is influenced by the internal rate of return (IRR) required by investors on their investments. Whereas an internal rate of return of 20% is assumed to be required by most investors in LDCs, LMC argues that the Ethiopian government, which is the main investor in the Ethiopian sugar industry, will accept an internal rate of return of 10% (LMC, 2004b:34). Under that condition, and at 33% EU price reduction, projected investments in production capacity are estimated USD443 million, which results in a production level of 938,000 tonnes over a period of seven to eight years (LMC, 2004b:39,42). In this scenario, Ethiopia would be able to export 464,000 tonnes to the EU. As a result, consequences are significant for industry revenue (+

€308 million), net export earnings (+ €70 million), employment (54,000 extra jobs) and land utilisation (44,000 more ha).

Ethiopian analysts project an even stronger increase of the country's sugar production, but these projections lack a sound study of possible markets for Ethiopian sugar. Wolde and Asseged (2005) indicate that the prospect of external markets opportunities and growing domestic sugar demand are major motives of the Ethiopian sugar industry's expansion programmes for the existing as well as for the development of two new sugar plants. Expansion and upgrading are also necessary to remain competitive, since Ethiopia's sugar factories are relatively small and use outdated equipment (LMC, 2004b12; IF, 2004). The milling capacity of the four existing factories are planned to increase from 12,500 to 33,000 tonnes cane/day. This expansion will require an additional 33,800 ha and provides extra employment for almost 29,000 people (Wolde and Asseged, 2005). The ESISC will further be responsible for the development of two new estates / factories in the middle and lower Awash basin (Wolde and Asseged, 2005), which will require about 70,000 ha of land and provide an additional 19,000 jobs. When these latter plants are in operation, total employment in the sugar industry will be 72,000, while land utilisation will be 127,800 ha. The total investment costs of the expansion program are estimated ETB8.123 billion or €721 million, which figure is about the same as the country's total GDP (!). This for the country enormous investment will have to be covered by the industry, the government and bank loans. Production is estimated to increase to 1.66 million tonnes in 2012, five times the production level in 2002. Wolde and Asseged (2005) are not very clear about the markets for all this produce. They expect the domestic consumption levels to (almost) double to around 500,000 tonnes. The rest - 1.15 million tonnes - should be exported to regional and the EU market. The authors, however, do not go into any details about market potentials: they refer to interviews with the sugar industry staff stating that Ethiopia could serve EU and regional markets.

6.5 Alternatives and outlook for sugar production and export

The increase in production can create new export opportunities for Ethiopia, but it is still unclear whether there are sufficient markets available for the export of Ethiopian sugar. There are no details about the country's future export markets, besides LMC's indication that Ethiopia's future access to regional markets is estimated 51,000 tonnes (LMC, 2004b:22). Therefore, Ethiopia could also look for alternatives to sugar exports. For instance, expansion of sugar production may be more profitable when the Ethiopian government uses the sugarcane molasses to produce anhydrous ethanol that can be blended with petrol (at a ratio of 10%). Ethiopia has an annual oil import of USD220 million, so the ethanol-blending could save USD22 million (Ethiopian Reporter, 2003). In 2002, the Finchaa sugar factory already inaugurated an ethanol factory, which produces 8 million litres of ethanol that can be blended with kerosene and can be used as household cooking fuel (Addis Tribune, 2002). Whether ethanol production would be a spearhead of government policy and/or would be economically attractive, is unknown.

Next to diversification within the sugar chain, diversification away from sugar should also be considered. However, diversification and expansion of the sugar sector in

Ethiopia was originally intended to reduce the dependence on coffee exports, Ethiopia's most important export commodity, which had also experienced a considerable decrease in profitability, due to instable market prices. Ethiopia was indeed successful to diversify its agricultural exports by increasing the exports of sugar, crude organic material, sesame seed, beans and cereals; the relative contribution of coffee to agricultural exports decreased from 79% in 1999 to 46% in 2002 (FAO, 2004). It remains to be seen whether sugar is a viable alternative on the long term, with eroding EU preferences and increasing competition in East and South Africa.

In any case, when the expansion plans of the Ethiopian sugar industry are implemented this will enhance development in the regions where new factories are built. The Lower and Mid Awash basins, possible locations for two new factories, are currently relatively underdeveloped (low incomes and poor social services) (LMC, 2004b:A19). There may also be opportunities for expansion of outgrowers' production, but this remains unclear.

6.6 Conclusions

The EU sugar trade reform offers increased market access to the Ethiopian sugar industry. Seen the low costs of production, the sugar industry may very well benefit from unlimited access after 2009 under the EBA agreement. LMC estimates that this export volume may increase to 464,000 tonnes (which is 45% of the 1 million tonnes expected from all LDCs under this scenario, LMC, 2004b:49). Expansion of production and exports of this size requires huge investments in existing and new sugar plants and is thus conditional to the availability of financial means. The government may accept relatively modest rates of return on its investment, but if expansion of the industry would need private (foreign) investors who would calculate with rates of return of 20%, supply effects may be much lower than simulated by LMC. Ethiopian analysts point at expansion and upgrading programmes that will result in production levels five times as high as in 2002. Domestic consumption may double, leaving about 1.1 million tonnes available for exports. Unclear in these projections is whether all this sugar production will find enough foreign markets. Especially when other regional low-cost producers such as Malawi, Sudan and Zambia will expand and increase their exports, competition at the regional markets will be tough. As for the EU market, Ethiopia is expected to become one of the larger exporters, but it seems very unlikely that Ethiopia will be able to export over 1 million tonnes of raw sugar to the EU.

7. Impact of EU sugar policy reforms on selected third countries: case study Mauritius

7.1 Introduction

In the 17th century the Dutch introduced the cultivation of sugar on the small island of Mauritius. Ever since, sugar cane cultivation has been the backbone of the island's agricultural economy. In 2003, sugar cane covered more than 74,000 ha, which is 70% of total arable land of 106,000 ha (Central Statistics Office, 2004; FAO, 2004). In 2003 sugar production contributed 3.3% to GDP, or 53% of total agricultural GDP. Furthermore, sugar is among the country's most important export commodities, accounting for 20% of total exports. This is due to the country's lucrative trade agreements with the EU and the USA, in which it benefits from high preferential prices. Under the ACP Sugar Protocol, Mauritius is allowed to export an annual amount of 491,000 tonnes of raw sugar or 38% of the total ACP export quota to the EU. Mauritius may export an additional 42,000 tonnes under the SPS agreement with the EU. The country may use a TRQ to export 12,600 tonnes raw sugar annually to the US. The country's annual sugar production normally amounts around 600,000 tonnes of raw sugar.

Mauritius is a small island with 1.2 million inhabitants and has the second highest GDP per capita in Africa. The country has a rather well diversified economy, partly the result of an intended government policy to reduce the dependency on sugar. Mauritius achieved 6% annual economic growth during the 1980s and 1990s (WTO, 2001). In the same period, the contribution of agriculture to the GDP declined to 6%, whereas manufacturing increased to 24% of GDP in 2001 (World Bank, 2004). This indicates the success the country had in its attempt to diversify the economy and reduce its dependency on sugar. At present, exports of textiles (mainly clothing) and other manufactured products account for a large part of foreign currency income, next to sugar. However, since the sugar industry is vastly linked to the country's history, the agricultural economy and land use, what will be the future for the sugar production in Mauritius when the sugar trade preferences erode because of the EU policy reforms? This chapter is to shed light on that question taking into account the country's possibilities to further diversify its (agricultural) economy from sugar.

7.2 Structure of the Mauritian sugar sector and government policies

Agriculture (production and land use) in Mauritius is dominated by sugar cane cultivation. Regarding the structure of the primary sugar sector a distinction can be made between the large sugar estates, accounting for about 45% of the 74,000 ha of sugar cane, and the small sugar planters owning the remaining 55% of the cultivated sugar cane land. The large planters own estates that range in size from roughly 750 to 5,500 ha, while the small farm-

ers grow sugar on plots ranging from less than one to 400 ha.[1] LMC estimates the number of workers in the Mauritian sugar industry (land and factory workers plus employees at the large sugar estates) at 28,000 in 2001 (LMC, 2004a: 46). More recent figures point out that the employment in the sugar cane sector in 2003 was 19,870, while the number of owner and tenant planters numbered 28,171 (Central Statistics Office, 2004). It is also noted that due to a Voluntary Retirement Scheme the number of workers had been reduced with almost 8,000 between 2001 and 2002 (Central Statistics Office, 2004).

The primary sector (sugar cane growers and estates) and the processing sector (sugar mills/factories) in Mauritius are strongly interlinked, for every large planter has his own factory. Sugar cane harvested at estates is processed in the factories of the large estates. The small farmers can send their harvest to these factories too. Ten years ago the government owned one estate and the British multinational Lonrho owned two estates and controlled another (US), but now the sugar sector in Mauritius is completely privatised and managed by domestic firms. In 2001, 14 sugar mills/factories were in operation (LMC, 2004a). However, restructuring plans have been made and are already being executed in part to reduce the number of mills substantially to 7 or 8.

Government policy

Since the 1990s the sugar industry has been subject to restructuring plans in order to increase its competitiveness. The Sugar Industry Efficiency Act of 1988 was aimed at both increasing the efficiency of sugar production and stimulating diversification within and away from the sugar industry, while the 1997 Blue Print on the Centralisation of Sugar Milling Operations in Mauritius set out a framework for the rationalisation of sugar milling operations, thereby reducing the number of mills from seventeen in 1996 to eleven in 2003. Actual restructuring started in 2001 when the Mauritius Sugar Authority presented the Sugar Sector Strategic Plan 2001-2005. The Mauritius Sugar Authority operates under the Ministry of Agriculture, Food Technology and Natural Resources and acts as an intermediary between government and organisations involved in sugar production (processors, sugar cane growers, research institutes, etc.). The sugar industry realised the need for further restructuring in order to improve its competitiveness.

Sugar production in Mauritius faces serious bottlenecks. Climatic conditions are not very suitable for growing sugar cane, while the hilly and rocky land limits possibilities for mechanical harvesting and for irrigation. Overall, sugar production costs in Mauritius are twice as high as in several other (East) African countries. Within the framework of the Plan the government supports investments in cultivation mechanisation and irrigation, facilitates a smooth labour outflow (through retirement schemes and adapting labour and pension laws), and assists the industry (through research) to increase the industry's value added through the expansion of production and export of speciality sugars (Ministry of Agriculture of Mauritius, 2001). The Plan aims at reducing the number of sugar mills, as well as the number of sugar workers, while the remaining mills should produce more efficient and ensure that export commitments such as under the ACP Sugar Protocol are fulfilled. To reach the latter, an average annual production of 620,000 tonnes of sugar is considered necessary. Mauritius is currently taking steps within the context of a new accelerated Stra-

[1] U.S. Library of Congress Country Studies: http://countrystudies.us/mauritius/16.htm (01-02-2005).

tegic Plan 2005-2015 to be competitive in the context of the EU sugar reform (Roy, 2005). Details of this Plan are, however, not yet published.

7.3 Sugar production and export trends in Mauritius

For decades sugar production levels in Mauritius have been rather stable between 600,000 and 700,000 tonnes, with the exception of periods with cyclones, droughts or excessive rainfall. In the 1960s and 1970s the production level sometimes exceeded 700,000 tonnes (ISO, 1976: 7) and Mauritius was among the ten largest exporters of the world. figure 7.1 shows production levels over the period 1994-2003. In this decade production levels ranged between 500,000 and 650,000 tonnes per year.

Mauritius' domestic sugar market
Annual average domestic consumption of sugar amounts between 40,000 and 43,000 tonnes in recent years, which is less than 10% of the country's sugar production. The domestic sugar demand is almost entirely provided for by imports from South Africa (and recently also from Mozambique). South African sugar is much cheaper than Mauritian sugar and cheap imports thus benefit the Mauritian consumers. But the most important reason for importing sugar is that this allows Mauritius to export its domestic produced sugar to the attractive markets in the EU and the USA as part of preferential trade agreements. Exports to these two markets are bound by quota, but may reach 545,000 tonnes, which is very near to the country's normal level of production. When there is an abundant harvest, like in 2001, imports decline and Mauritian sugar is consumed domestically as well. Contrary to some other developing countries, it is expected that the level of domestic sugar consumption in Mauritius will not rise significantly in the next five years. Domestic consumption in 2010 is projected to be between 44,000 and 45,000 tonnes (LMC, 2004a: 18), which implies an annual per capita intake of 27 kg sugar.

Export of sugar
Mauritian sugar export levels show the same development as production levels (figure 7.1). The country produces mainly raw sugar for exports, as well as small quantities of white speciality sugar, mainly for the European market. Between 1994 and 2003 the export levels fluctuated but were on average in the range of 550,000 to 600,000 tonnes. With this export level, Mauritius is among the largest sugar exporters of the world (see also table 2.1 in chapter 2). Most of the sugar is exported to the EU under the ACP Sugar Protocol and the Special Preferential Sugar agreement. According to figures of the Mauritius Sugar Syndicate, between 2000-2003 Mauritius exported between 95-98% of its raw sugar exports to the EU (Central Statistics Office, 2004). The country thus greatly benefits from these trade agreements with the Union, which can be traced back to the 1950s when Mauritius was also a large supplier of sugar under the Commonwealth Sugar Agreement. Small quantities of sugar are exported to Israel, Switzerland and the USA (ISO, 2004). Mauritius does not export its sugar to other African countries in the Southeast region, due to its relatively high production costs (far above the world market price). Indeed, for African standards, Mauritius is a high-cost producer. Since prices received in the EU and the USA are three times

higher than the world market prices, sugar production in Mauritius is profitable. Trade in speciality sugars does not take place under special trade agreements and its production appears profitable against world market prices.

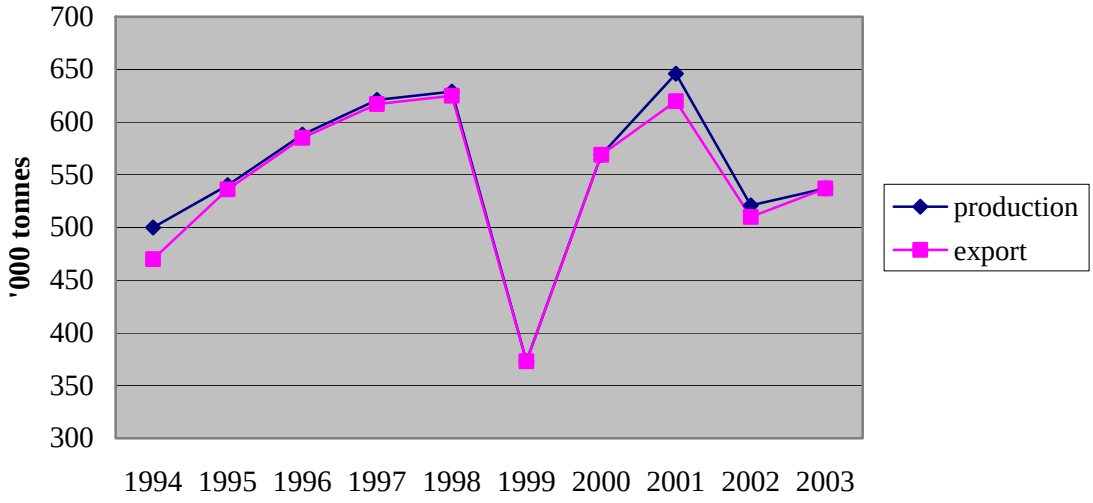


Figure 7.1 Mauritius: sugar production and export 1994-2003
Source: Central Statistics Office Mauritius, 2004 (figures of the Mauritius Sugar Syndicate).

7.4 Consequences of European sugar reform and the EBA agreement for Mauritius' sugar export

Since 2001, when the EBA agreement came into force, several studies have been undertaken to estimate the effects of this trade agreement for the ACP producers (LMC, 2002; UNCTAD, 2001). These studies indicate that imports under the EBA agreement will gradually replace the imports under the SPS agreement (of 217,000 tonnes in 2003/4). Additionally, the quota- and duty-free access for LDCs would force down the EU-price, which would also affect the ACP producers. Furthermore, the July 2004 policy reform proposal by the European Commission is very likely to have significant impact on the prices paid for ACP sugar under the SP. Lower prices in its exports to the EU is expected to reduce Mauritius export position on the world sugar market importantly as Mauritius sugar production is unlikely to be able to compete internationally against world market conditions.

A study of the European Court of Auditors (2001) reveals that production costs in Mauritius are double those of low cost producers Malawi, Swaziland and Zimbabwe. In it's 2002 study LMC estimates full costs of raw sugar production in Mauritius at €454/ton. Adding costs for insurance and freight (Cif) to it would imply an entrance price at the EU market of €506/ton. Projections of LMC point out that Mauritius might be able to reduce

its costs of production by around 10% towards an entry price of €464/ton.[1] This means that the current EU intervention price of raw sugar (€524/ton) could be reduced 11-12% at most to keep sugar exports to the EU attractive for the Mauritian sugar industry.

Another LMC study on the implications of European sugar reform for developing countries focuses primarily on the ACP countries and also discusses the possibilities for addressing the negative impact of preference erosion (LMC, 2004a). The report points at the wide range of costs among ACP sugar producers. According to LMC Mauritius can be classified as a medium-cost producer. LMC estimates that the existing plans for the industry restructuring will not result in a reduction of the sugar production, but will make sugar processing more efficient through the rationalisation and concentration of mills.

However, assuming a EU intervention price cut towards €329/ton with unlimited access to the EU (thus, without preferential quota) LMC indicates that the Mauritian sugar industry will need further restructuring, beyond the existing plans, in order to remain financially viable following preference erosion. The country would be unable to supply EU markets in the event of a 37% fall in prices. Indeed, the high level of dependence of the Mauritius industry on the EU market for its sugar sales (some 80-90% of Mauritius sugar production is sold to the EU) means that the industry is extremely vulnerable to reductions in the EU price. A 37% EU price reduction therefore implies an on average 30-33% lower selling prices received by the Mauritian sugar industry. Such a price decline will result in a significant fall in the industry's profitability if the sugar industry is not further restructured. LMC has good confidence in a successful restructuring process in the Mauritian sugar industry and, therefore, projects that the country will be able to maintain its exports levels to the Union, even at EU prices of €329/ton for raw sugar. Of course, the price cut will have a substantial negative impact on the industry's revenue (through a reduction of export earnings) and a negative impact on employment (through restructuring). Moreover, as the sugar sector is such an important part of the Mauritian agricultural sector, the impact of a EU price cut to €329/ton on the relative contribution of agriculture to GDP would be significant too (in this case a reduction of more than 40%). Simulations of a fully liberalised EU policy scenario would imply that sugar production in Mauritius would disappear (LMC, 2004a:26). In any case, a raw sugar price reduction from €524/ton to €329/ton would mean an income loss of €96 million (on the basis of the current SP export volume of 491,000 tonnes) (Laurent, 2004).

7.5 Alternatives and outlook for sugar production and export

Alternative export markets

Having discussed the relatively high costs of production in Mauritius as well as the difficulties of keeping a profitable sugar sector under a reformed European regime, it may be clear that the Mauritian sugar industry cannot compete on the world market with its lower and unpredictable prices. Mauritius will surely not be able to compete with Brazil, Thailand and Australia, which are the dominant players on this residual market. And even if

[1] According to Roy (2005) the sugar industry has indeed reduced production costs significantly in recent years.

there were some export opportunities, prices are probably too low to offer long-terms prospects to the industry to cover full production costs.

The gloomy long-term prospects for the Mauritian sugar industry have influenced the business strategies of several sugar companies. Recently, the South African based sugar giant Illovo pulled back from sugar production in Mauritius, due to the absence of expansion opportunities. Moreover, the company considers the government-imposed profit-sharing quite unfavourable as growers get 80% and the industry the remaining 20% (interview with Illovo representatives, 26/11/2004). Next to Illovo's draw back, some Mauritian sugar companies have invested in Mozambique and Zambia, two low-cost producers that are expected to benefit from the EBA agreement (LMC, 2002). The sugar production in Mozambique by the Mauritius consortium started in 2001 with a share of 75% in the Sena Holding. The Mauritians, with their experience in research and marketing, can surely contribute to the development of the Mozambican sugar industry. Furthermore, the Mozambican activities can provide jobs for a number of Mauritians, who deliver the know-how needed for sugar production.

Diversification within the sugar sector

Since the opportunities for finding new export markets for raw (or refined) sugar are very limited, Mauritius has used its know-how in sugar technology to develop a range of so-called special sugars. These special sugars 'preserve the goodness of the cane juice through its molasses content, its mineral nutrients and distinctive flavour' (Roy, 2004:7). Starting in the 1980s, the Mauritius Sugar Syndicate successfully marketed a range of seventeen special sugars. Nowadays, about 70,000 tonnes of these special sugars are sold at relatively high prices in the EU and the US as well as on the world market. The effective marketing strategy helped Mauritius to build the image of a producer of high quality special cane sugars. However, the market for special sugars is relatively small and competition is fierce and increasing. Fifteen years ago the World Bank (1989) already reported that this would constrain the expansion of special sugar production and although Mauritius is still the world leader, innovation and good marketing will be very important in the future (Roy, 2003). Next to the development and marketing of special sugars, Mauritius has been using the sugar by-product bagasse for the generation of 20 to 25% of the total electricity demand. This has significantly reduced the country's dependence on imported oil. The 2001-2005 Sector's Strategic Plan refers to the objective to generate as much electricity from bagasse as possible to relief the country's costs of importing fossil fuel from overseas. Furthermore, the industry is encouraged to look at possibilities of using sugar for ethanol production (Ministry of Agriculture of Mauritius, 2001). These efforts will need further encouragement when EU policy reforms will be applied and affect EU import prices under the ACP Sugar Protocol.

Diversification away from sugar

Since the opportunities for diversification within the sugar chain are not exhaustive, Mauritius has looked at possibilities for diversification outside the sugar sector. Alternative cash crops are few; Mauritius produces tea and tobacco but in small quantities. Essentially Mauritius is an agricultural mono-economy, with limited opportunities to grow other big cash crops. Further, a political dimension of diversification is self-sufficiency (food security)

and this resulted in an increase of food crop production in Mauritius, thereby limiting the expansion of cash crops (see e.g. for developments in the 1970s and 1980s: World Bank, 1989). In recent years the production of flowers, and of fruits and vegetables has increased for which overseas markets are found in Europe, Asia, Australia and the US, but these crops remain relatively small. More recently, the 2003 Non-Sugar Sector Strategic Plan presents a reorientation strategy for achieving a 'modern agriculture'. The central aim is a transition from traditional practices towards a more sophisticated, technology-based approach to agriculture. Some specific objectives in this respect are increasing self-sufficiency in agricultural sectors, increasing quality levels, optimizing export opportunities and conforming to the international norms governing food safety (Ministry of Agriculture of Mauritius, 2003).

Since the early 1960s Mauritius has tried to diversify its economy towards activities in industry and services, with noticeable success during the 1980s and 1990s. Especially the tertiary sector (tourism, financial services) has gained importance and now delivers more than 70% of GDP. At present, the Mauritian exports largely depend on the manufacturing industry, mainly textiles and clothing. The diversification process took off after some years of economic decline around 1980, caused by natural disasters (cyclones) and economic disequilibria (budget deficits, inflation). Economic growth was led by production in the export processing zones (EPZ), a competitive exchange rate and by savings and investment rates exceeding 20% of GDP (World Bank, 2002). Mauritius was the first African country to create EPZs. Unlike later investors in other African EPZs, most investors in Mauritius' EPZs were nationals. Those Mauritian entrepreneurs, whose ancestors came from India, France, China and other countries, took advantage of links with their countries of origin. Exceptional export performance propelled Mauritius to higher standards of living. On a per capita basis, Mauritius' manufactured exports are more than 150 times that of the average Sub-Saharan African country. Today, Mauritian exports exceed USD1 billion in industrial and processed products; the median African country exports about USD28 million of similar goods. Mauritian investors have also become important players in the development of lower end textile production at low labour cost in neighbouring countries. As textile has become an important area in the Mauritian economy, the country fears that the end of the Multi Fibre Agreement may have a negative impact on key economic parameters (Roy, 2005). Today, Mauritius' GDP per capita is the second highest in Africa.

7.6 Conclusions

The Mauritian sugar industry dominates the country's agricultural sector. The sector is heavily dependent on the EU market, at which it sells around 90-95% of the annual exports under the ACP Sugar Protocol and Special Preferential Sugar agreements. The industry's production plus transport costs are estimated around €464/ton, taking into account the impact of present restructuring process in the sector. EU sugar reforms implying an intervention price of €329/ton would enforce further restructuring of the Mauritian sugar industry, with significant negative effects on the industry's revenues and employment.

Mauritius has anticipated the upcoming EU sugar reforms to some extent, both with sugar restructuring plans as well as to encourage further diversification of its economy. Still, the agricultural economy mainly relies on sugar export possibilities to the EU. Given its level of production costs - even after further restructuring - Mauritius is not expected to play an important role on the international sugar market, even when world prices would rise considerably. The best EU reform option for Mauritius would be a reduction of EU production quotas, whereby the price remains at a remunerative level. Clearly, for Mauritius the price is the most important aspect of the export agreement, while a reduction of the quota would be in line with the current process of rationalisation.

The ACP countries are now pushing the European Competitiveness Fund to finance the restructuring of their sugar industries. Further Mauritius will come up with an Action Plan for 2005-2015 for further restructuring as a reaction on the EU sugar reform. One important aspect that has to be tackled is the indebtedness of the sugar producers (USD200 million[1]). Further, the acreage under sugar cane as well as the level production are expected to be reduced (Li Yuen Fong, 2004). Yet, it remains to be seen whether sugar production in Mauritius would be competitive on the long run.

[1] http://ipsnews.net/interna.asp?idnews=26607 (viewed on 02/02/2005).

8. The impact of the EU sugar policy reform on Brazil's sugar industry[1]

8.1 Introduction

Brazil is the world's largest sugar producer and exporter. The country accounts for around 15% of the world sugar production and for some 25-30% of global exports in recent years (see table 2.1 and 2.2). Sugar exports have played an import role in the Brazilian economic development since the 1970s. In 1999, exports reached a record level of 13 million tonnes, mainly thanks to the liberalization in the ethanol sector. The end of the Alcohol Program, through which the government stimulated alcohol production out of sugar cane with guaranteed prices and subsidies, brought an important shift from ethanol to sugar production and exports. Technology was available to support the shift, which enabled Brazil to quickly increase its sugar production and exports.

This chapter is to analyse the impact of the EU sugar policy reform on sugar production and export opportunities in Brazil. The work is organised as follow. Section 2 describes the structure of the Brazilian sugar sector. Section 3 discusses the sugar production and export trends of Brazil. Next, section 4 focuses on the consequences of the European policy reforms for the Brazilian sugar export opportunities. Section 5 addresses the alternative market opportunities for the Brazilian sugar industry and the possibilities for diversification. A final section draws some conclusions.

8.2 Structural features of the Brazilian sugar sector and government policies

The sugar industry is an important sector for the Brazilian economy, with a share of 7.0% in agricultural exports in 2003 (Ministry of Agriculture, 2004:30). The production of sugar cane spreads through the Centre-Southern (state of Sao Paulo) and North-North-eastern regions of the country (Pernambuco and Alagoas), in two crop periods, and occupies 24% percent of the Brazilian arable land, i.e., around 5.5 million ha. The state of Sao Paulo is the largest producer and accounts for 72% of the total production, followed by the North-east region with 15%, and other states with 13%. While sugar production used to be concentrated in the Northeast, Sao Paulo has now become the centre of the booming Brazilian sugar industry.

Sugar cane production has increased very rapidly over the last decades, from around 80 million tonnes in 1970 to 340 million tonnes in 2003 (see table 8.1). Most Brazilian sugar cane is cultivated on large estates. Independent producers, widely varying in size, cultivate only 20-30 % of the land. In total there are about 60,000 cane growing farms in Brazil (OECD, 2001: 25). Recently Brazilian farmers have discovered the advantages of

[1] This chapter draws on a background paper by Sylvia M. Saes and Decio Zylbersztajn, PENSA, University of São Paulo (see reference list).

forming a cooperative that can market their combined sugar and alcohol production. Sugar cane is processed into sugar and alcohol on a 50:50 basis in recent years. Brazil's sugar-alcohol industry generates one million direct jobs. The economy of over 960 municipalities (17% of all Brazilian municipalities) is strongly influenced by this activity, in terms of job and income generation (ÚNICA, 2004).

Table 8.1 Features of the Brazilian sugar sector (2003)

Features	*Data*
Sugar cane production	340 million tonnes
Sugar production	25 million tonnes
Alcohol production	15 million m^3
Mills	320 units
Direct jobs	1 million
Sugar exportation	13 million tonnes (USD2 billion)

Source: ÚNICA, 2004.

A total of 320 sugar cane-processing units operate in Brazil. Out of this total 226 units operate in the centre-south region. In this region 83% of the 2003-2004 sugar cane harvest has been processed. Factories of average size process 1.5 million tonnes of sugar cane a year. The ten biggest sugar plants / distilleries crush between 3.6 and 6.8 million tonnes of sugar cane per unit, during the crop season. Each of these large industrial plants produces between 300,000 and 450,000 tonnes of sugar and between 175 and 330 million litres of ethanol.

Sugar cane production has led to alternate production such as hydrated and anhydrous alcohol, sugar or even electricity. Sugar cane produces mixed syrup that can be applied in the production of both sugar and alcohol. From all sugar plants in Brazil, 27% produce only alcohol. The remaining plants have the flexibility to produce sugar and alcohol. This flexibility allows the industry to react to changing market conditions for sugar and/or alcohol. At the same time, however, companies have contracts with their clients, which may prevent the sugar plants to shift from sugar to alcohol production or vice versa. Also, large companies are vertically integrated with soft drink or other beverages companies and supply a large part of their production to associated companies. There are also sugar companies investing in diversification, such as diet or light sugar production, which may limit their possibilities to shift from sugar to alcohol production. The industry also generates many by-products. For instance, sugar bagasse, one of the end products of milling, can be used to generate power or as a raw material in cellulose production (UNICA, 2004) The sugar agribusiness system is vertically integrated to benefit from scale economies and manage coordination needs. Vertically integrated firms that also refine and package the product supply about 70% of the sugar cane. Farms are for the most part adjacent to the industries: the specificity of the place is required, as sugar cane must not take long to be processed. Table 8.2 shows the ranking of the sugar and alcohol mills in the state of São Paulo. As can be seen, major sugar producers are also alcohol producers.

Regional differences

There are considerable regional differences in Brazil with regard to efficiency of sugar production. The Northeast region is by far less efficient than the Centre-South. Before the Pro-alcohol programme, the state of Pernambuco in the North-East was the largest production region in Brazil, Now, the sugar sector in Pernambuco and Alagoas is still important to the regional economy, but the state of Sao Paulo in the Centre-South is by far the leading sugar cane producing region. The Centre-South region is characterized by high productive soils and excellent growing conditions. It is regarded as one of the lowest cost sugar cane growing areas in the world and has great prospects for further expansion. The liberalisation process will further enforce the regional shift in sugar production, since producers in the Northeast need price support to compensate for their relatively low yields and high production costs because of poor growing conditions. Both field and factory costs in this region are higher than in the Centre-South. To compensate for its relatively weak competitive position, the Brazilian government has allocated the USA TRQ for Brazil to producers in the North-eastern region.

Government policy in the sugar and ethanol sector

For almost a century, the sector operated under governmental regulation. Starting in 1933, the policy objectives were to coordinate production and control consumer prices (Farina and Zylberstajn, 1998). Prices for farmers as well as for processors of sugar cane were artificially set by adding a margin to the production costs, with a view to keeping consumer prices under control. The Alcohol and Sugar Institute (IAA) managed and controlled the sugar and alcohol production, prices and exports.

Two years after the oil crisis of 1973, the Brazilian government created the National Alcohol Program (PROALCOOL), aimed at increasing the alcohol production to replace the expensive oil, particularly in transportation. The gradually developed policy framework offered incentives such as: a) a guaranteed price for ethanol; b) the control of the ethanol distribution by the state-owned oil company (PETROBRAS); c) incentives for building distilleries (guaranteed credit, low interest rate) and; d) direct aids to fuel-alcohol producers (in 1999 the producers received USD2.50 per hectolitre).[1] Further, the government obligated the blending of gasoline with a certain percentage of alcohol (anhydrous alcohol) while government vehicles and busses had to use pure alcohol (hydrous alcohol).

Reform programmes in the 1990s aiming at restructuring Brazils economic imbalances illustrated by high inflation and fiscal deficits marked a decline in federal intervention policies. In the mid-1990s several factors put the alcohol programme under great pressure. Oil prices declined and the ethanol programme led to overproduction of alcohol and a financial burden for the government. Consequently, reform proved to be unavoidable, although the sector had a high socio-economic importance. At the end of 1996 the government presented the first proposals for liberalisation of the ethanol/sugar market. The period between 1997 and 1999 coincided with the end of the monopoly of the state-owned oil company PETROBRAS, the liberalisation of ethanol prices and production quotas and the reduction of (credit) subsidies. Nowadays the only government intervention

[1] Loans were limited to 80% of the investments for sugar cane mills. Credit was available also for farming. Conditions for credits were more flexible in specific regions like the dry areas of the Northeast.

concerns the fixation of the anhydrous ethanol blend ratio between 20 to 25%. That proportion represents around 11.5 billion litres/year of ethanol. The blending is set forth in the Brazilian environmental legislation (since 1993), aimed at reducing carbon dioxide emissions. There is no anhydrous alcohol volume allotted among producers in the form of individual quotas to be met by companies (Serodio, 2005).

The farmers are paid for their sugar cane according to prices received in the sale of the sector's end products, the market's supply and demand conditions, and the CONSECANA system (Council of Sugar cane, Sugar and Alcohol Producers), which sets quality assessment technological criteria. This system is based on a formula that takes into consideration both the total content of sugar in the raw material and sugar and alcohol prices in the domestic and international market. The value of the sugar cane in Brazil represents 60 % of the industry's revenues. In the state of São Paulo, the industry paid farmers about USD10.35 per ton of sugar cane supplied to industrial units in the crop year 2003/2004.

While in the early 1990s over 70% of the Brazilian sugar cane was used for alcohol production, at the end of 1990s sugar cane production has been almost equally divided into alcohol and sugar production. Sugar production increased due to positive perspectives in the international sugar market and due to the decline in the production of fuel alcohol for cars. However, the world market for sugar is relatively small (because of the prominence of preferential trade agreements) and the increase in Brazilian sugar production resulted in lower market prices at the end of the 1990s. However, since 2002 there is a significant increase in the production of cars with flexi-fuel engines in Brazil while it is expected that in the near future no more exclusive gas engines will be in use (Anfavea, 2004). This will again create more opportunities for ethanol production, especially when Brazil will be able to attract foreign buyers of ethanol. In the most recent years on average 55% of Brazilian sugar cane turned into alcohol and 45% into sugar (UNICA, 2004).

8.3 Sugar production and export trends of Brazil

The level of Brazilian sugar production is strongly influenced by the Pro-alcohol programme. In the mid 1980s half of the Brazilian cars used hydrous (pure) ethanol as an alternative for petrol. In the 1990s, when oil prices declined, the production of hydrous ethanol fuelled cars came to a halt. However, new environmental legislation was designed aimed at reducing carbon dioxide (CO2) (Serodio, 2003). The new legislation in combination with declining oil prices boosted the production of anhydrous ethyl alcohol (blended fuel). As a result, as figure 8.1 shows, sugar production (relative to ethanol) increased. The depreciation of the Brazilian real further stimulated sugar production and export and production increased from 11.7 million tonnes in 1995 to 24.8 million tonnes in 2004 (ÚNICA, 2004).

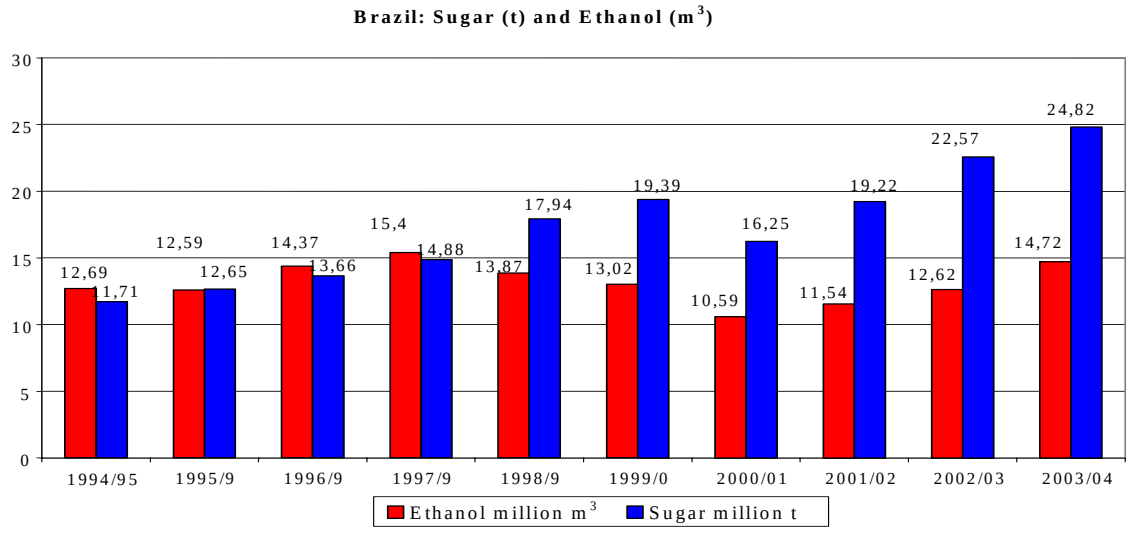


Figure 8.1 Sugar and ethanol production in Brazil, 1994-2004
Source: ÚNICA, 2004.

Recently, the demand for cane-based ethanol was re-established by the increasing oil price and this further stimulates the expansion of sugar cane production. At the moment again more than half of the annual sugar cane production is absorbed by Brazil's large ethanol sector and this has not led to a reduction of sugar production. Brazil seems to be able to increase both its sugar and ethanol production, although the trade-off between sugar and ethanol creates a factor of uncertainty with regard to the stability of the world market. At times when the oil price is low, sugar cane is mainly processed into sugar and sugar exports will increase. This in turn will have its influence on world sugar prices. Consequently, the future of the Brazilian sugar sector depends on many factors: the world sugar price, the value of the real against the dollar and euro, the oil price and the domestic demand for ethanol, export opportunities for cane-based ethanol, the outcome of the European sugar reform and the outcome of an WTO panel on European sugar export subsidies.

Brazil's domestic sugar market
While Brazil is the world's main sugar producer and exporter, it is also the world's fifth largest sugar consumer. Moreover, sugar exports are seen as the third alternative for sugar cane after production of sugar and ethanol for the large domestic market (Mitchell, 2004). Domestic sugar consumption has grown from 8.2 million tonnes in 1995 to 10.0 million tonnes in 2002 (ISO, 2003; NDSU, 2004), thereby reflecting an annual per capita consumption of 53 kg - where a world average is 22 kg/capita. Consumption is projected to increase slightly towards 10.7 million tonnes in 2013 (NDSU, 2004). Domestic ethanol consumption amounted to 12 billion litres in 2004, while exports reached 1.5 billion tonnes (FO Licht, 2004).

Export of Brazilian sugar

The dynamics of the Brazilian market has affected the country's share in the international market. Sugar production in Brazil has more than doubled in the 1990s to reach a share of 15% of world's sugar production (see Table 2.2 in Chapter 2). At present, above half of the Brazilian domestic production is destined to the international market. Sugar exports have developed very rapidly in the 1990s (Figure 8.2). Nowadays, sugar is one of the most important agricultural export products of Brazil, with an expected export of 16 million tonnes in 2004/2005 (FO Licht, 2004).

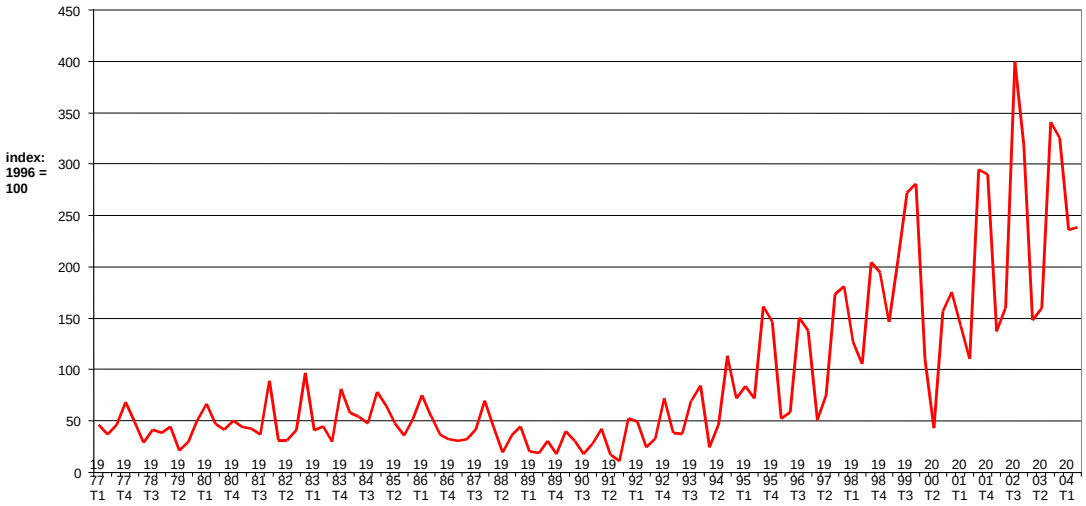


Figure 8.2 The development of the Brazilian sugar export volume, 1977-2004 (1996 = 100)
Source: IPEADATA (2004).

Table 2.1 (in chapter 2) shows Brazil's export position compared to other major sugar exporters in the world. In 2003, from the total exports of raw sugar, Brazil cornered a 33 % market share, i.e. 5.2 million tonnes, followed by Australia with 15%. As for refined (white) sugar, Brazil has 21% of market share or 7.9 million tonnes. The European Union is the largest exporter of white sugar, with 26% of the total internationally traded volume.

According to the OECD Brazil increased its share in world net exports from 7% in 1990 to 37% in 1999 (OECD, 2001: 15). Increased sugar production (diversification away from ethanol), the removal in 1998 of a 40% tax on exports of sugar beyond a set quota and the 40 % devaluation of the Brazilian currency in January 1999 all contributed to the growth in shipments (ABARE, 1999: 56). The Northeast region profits from preferential exports to the USA (tariff rate quota of around 150,000 tonnes annually), while the Sao-Paulo region, next to the ethanol production, has traditionally focused on requirements for direct domestic consumption and the manufacture of products containing sugar. Yet, the enormous production potential in the Centre-South is increasingly used to expand market share in new markets in North and West Africa as well as in the Middle East.

Countries with refining capacity, such as Canada, Egypt, Iran and Russia, import raw sugar, while African and Middle Eastern countries are the main buyers of white sugar. Further, Brazil has been able to expand in the Southeast Asian markets Malaysia and Indonesia in 1998 and 1999, where as a consequence of the Asian crisis the traditional exporters Australia and Thailand (temporarily?) lost markets. However, the latter are valuable partners of Brazil in its appeal against European export subsidies. Therefore it is not expected that Brazil will pursue aggressive marketing policies in this region, although estimations point out that consumption of sugar in Asia may grow considerably in the future, thereby creating additional export opportunities for Brazil. Table 8.2 provides an overview of the main buyers of Brazilian, whereby Russia has become Brazil's main export market since sugar exports of Cuba (the traditional supplier of the Soviet Union) fell dramatically in the 1990s.

Table 8.2 Biggest importers of Brazilian sugar (2003)

Countries	*Million t*	*Million USD FOB*	*USD FOB/t*
Russian Federation	3.84	597.72	155.59
United Arab Emirates	0.98	152.32	155.46
Nigeria	0.82	144.09	175.51
Canada	0.76	118.09	154.66
Senegal	0.73	115.69	157.43
Algeria	0.52	85.02	163.60
Egypt	0.52	87.23	169.34
Morocco	0.51	82.73	161.09
Saudi Arabia	0.34	51.15	150.63
Ghana	0.32	56.82	177.08
Yemen	0.25	41.41	164.96
Angola	0.20	35.91	183.00
Romania	0.19	31.55	165.03
United States	0.18	72.74	401.20

Source: ÚNICA, 2004.

8.4 Consequences of European sugar reform for Brazilian sugar export opportunities

The EU sugar market is protected by high (since the Uruguay Round) fixed import tariffs, which are €339/ton for raw sugar and €419/ton for white sugar. A 'special safeguard clause' allows the EU to impose an additional duty if the value of imported sugar falls below a trigger price of €531 per ton. These duties make imports of sugar outside of preferential arrangements largely uneconomic. Preferential sugar trade arrangements are mainly with developing countries (ACP countries, India and the EBA countries, see section 3.3). At present, Brazil is allowed to export an amount of 29,960 tonnes of raw sugar to the EU under the MFN commitment (export agreement with Finland before Finland joined the EU). These features of the EU import regime explain why the EU is not one of Brazil's main export markets despite Brazilian competitiveness on the international sugar markets (see also table 8.4). Furthermore, a significant part of the EU's surplus 'A' and 'B' production is exported outside of the EU market, using export refunds to cover the difference between the

EU and world market price. This limits Brazil's export opportunities to third countries. EU (and countries with similar protectionist) policies force Brazil to stimulate efficiency in order to remain competitive and to keep its market position.

Costa and Burnquist (2004) show that the effect of the elimination of sugar market regulation in the USA and the EU may lead to a 'considerable increase' in Brazil's sugar exports to these two markets. With regard to the EU, their estimates consider the average Brazilian exports over the period 1996-2002 and look at the effects of an elimination of the import quotas and price support policy. The authors estimate that Brazil's exports (of raw sugar) increase with USD13.5 million, which is a 55% increase of Brazil's average annual export value over the period 1996-2002. This may be significant in percentage terms, yet the effects are minor in terms of total imports of the EU as well as in terms of total exports of Brazil. The study does not make clear why Brazil would not gain more from such a drastic policy reform in the EU. The focus of the study is more on domestic and regional impacts of liberalisation in the two protected markets. The study indicates that the low-cost producers in the centre-south region would benefit most from the increased market access to EU and USA markets, while the north-northeast region would benefit less than proportional. There are no other quantitative analyses known that focus on the impact of EU sugar trade reforms on the Brazilian sugar exports. There are several (qualitative) analyses of the possible impact of EU sugar trade reforms on Brazilian export opportunities and these are rather sceptical (Icone, 2004; Zylbersztajn, Jank and Nasser, 2004). Furthermore, the increase of exports will not necessarily lead to higher sector profit gains. Since 1995, prices have been decreasing, which has resulted in the decrease of the export profitability of the Brazilian sugar industry (figure 8.3).

Next to the unilateral reforms in the EU and US sugar markets, the outcome of the developments within the WTO is also very important for Brazil. Firstly, the current Doha Round aims at increasing multilateral liberalization by reducing export subsidies and removing trade barriers. Secondly, a WTO panel recently concluded that the EU is exporting sugar above its WTO commitments. In principle the EU is eligible to subsidize exports up to 1.273 million tonnes, but according to the WTO the EU is illegally exporting C sugar above this level by means of cross-subsidisation, lifting the total level of export in 2002 to 4.707 million tonnes.[1] According to its July 2004 proposal the EU wants to reduce subsidised exports to 400,000 tonnes, but there will be no limit on the export of C sugar. However, when the judgment of the WTO panel will be confirmed, it is expected that EU sugar exports will decrease significantly, providing Brazil the opportunity to take over EU export markets. Currently, the five largest importers of EU sugar are Algeria, Syria, Israel, United Arab Emirates and Egypt (European Commission, 2003a). According to table 8.2 three of these countries are already large importers of Brazilian sugar, which makes it likely that Brazil will expand on these export markets.

An interesting observation is that the European sugar industry has already taken a strategic position by buying shares in Brazilian sugar mills. This implicates that many European sugar companies acknowledge the good perspectives of the Brazilian sugar industry and anticipate an international market situation with lower trade barriers. For example, several French sugar beet companies have acquired Brazilian companies in the

[1] http://europa.eu.int/comm/agriculture/agrista/2003/table_en/4331.pdf .

last 4 years. Cosan (a Brazilian company) coordinated three of them and the other three were coordinated by a joint venture among Cosan, the French company Union SDA (Union Sucreries et Destilleries de l'Aisne - important producer of beet root and derivatives in France and in the Czech Republic) and Sudden (an international sugar trade), as the FDA Group (Franco Brasileira Açúcar e Álcool). The FDA Group is now the biggest producer of sugar and alcohol in Brazil with 10% of the total mill capacity of sugar cane. The Group has become the largest individual producers, with over 22 million tonnes of ground sugar cane, sugar exports amounting to 1.6 million tonnes and 80 million litres of alcohol. Like other companies in this industry, the FDA Group is directing their operations towards the international market of traditional commodity products (sugar) and towards developing new products and distribution channels for international clients (Zylbersztajn, Jank and Nasser, 2004). Other examples of European investments in the Brazilian sugar industry are the Louis Dreyfus group and Europe´s largest sugar/alcohol company Eridania Béghin-Say. The latter operates 26 sugar plants in France, Italy and Hungary, and is part of the French consortium Origny-Naples (Pinazza and Alimandro, 2004).

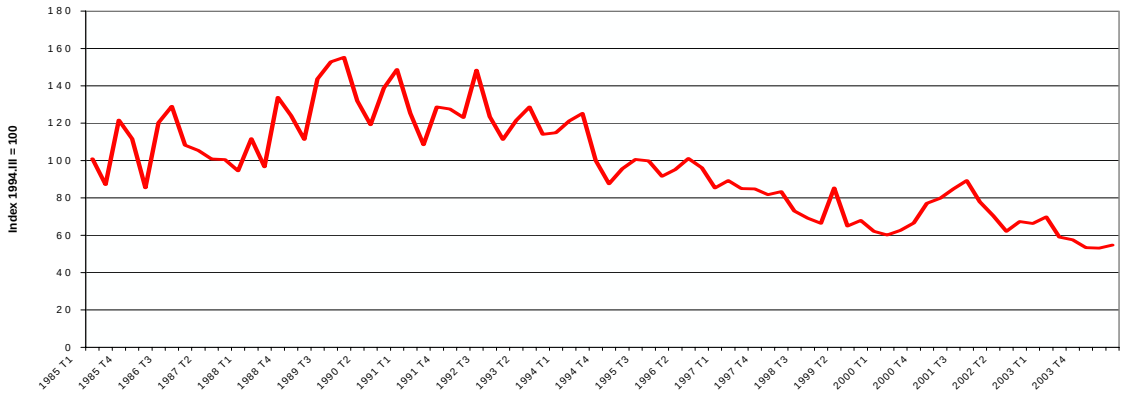


Figure 8.3 Sugar export profitability in Brazil (1994-III = 100)
Source: Funcex apud IPEA (2004).

8.5 Alternatives and outlook for sugar production and export

Due to the current developments in the EU and the WTO the market prospect of Brazilian sugar is bright. Next to that, individual countries' commitments to increase the use of environmental friendly energy sources could lead to a growing export market for ethanol. Therefore market, analysts think Brazil will continue to increase both its ethanol and sugar production. The industry has already announced investment plans up to USD6 billion until 2010, with area planted with sugar cane expanding to 7.5 million hectare and increasing the number of mills with 40 in 2007 (FO Licht, 2004).

As regards sugar, it is expected that the focus in the future will lie more on raw sugar. On the one hand price difference between raw and white sugar decline and thus

processing margins get smaller and on the other hand some major importing countries (Saudi Arabia, Dubai and Algeria) have increased their refining capacity, which creates opportunities for raw cane sugar exporters (Rabobank, 2004: 70). However, Russia intends to increase its domestic beet production so that Brazil will have to continue searching for new sugar markets.

As regards ethanol, several countries (e.g. Japan and Germany) have already indicated that they want to increase the use of ethanol as an alternative fuel. Because of its flexibility to diversify between raw sugar, white sugar, anhydrous ethanol and hydrous ethanol Brazil could easily anticipate changes in the respective markets. Moreover, the potential for expansion of sugar cane production in Brazil is enormous: there are large reserves of agricultural land, and research into and development of new technologies will help to improve the average yields per hectare and lower production costs significantly. About 45% of the Brazilian cultivated area is suitable for mechanization and the sugar companies are very rapidly adopting new technology. The period of strong governmental intervention clearly left a tradition of research, both on the industry and on farm agricultural production with visible effects in terms of efficiency gains. For instance, production costs are low, averaging around USD170 per ton among the most efficient mills in Sao Paulo, considering the exchange rate of BRL2.30 per dollar. Even in the less efficient areas in the Northeast, sugar cane is produced against relatively low costs: in Australia production costs average USD270 per ton, in Thailand USD310 and in Europe USD500 per ton (Schouchana and Widonsck, 2001).[1] Figure 8.4 below summarises the competitive factors for sugar production in Brazil.

Agriculture	*Industry*
Soils	Multipurpose plants
Rain and water availability	Low cost and co-generation of energy.
No need of irrigation	Full use of sugar cane
Re-utilisation of the by-product (vinhoto)	Local knowledge centres in sugar-alcohol
High yields	Technology and management up-dated industry
Genetic technology	

Figure 8.4 Brazilian competitive factors for sugar production
Source: MAPA, 2004.

8.6 Conclusions

The sugar and fuel ethanol industry is one of the most important sectors for Brazilian agribusiness exports. Brazil is the world's largest and most competitive producer of sugar and ethanol, and the leading sugar and ethanol exporter. Sugar production in Brazil has increased strongly since the 1970s when the Pro-alcohol programme encouraged the production of sugar cane for fuel ethanol as alternative source for car petrol. At present government intervention in the sugar market in Brazil is very modest: market forces determine prices for sugar and fuel ethanol, and thus sugar cane production. The EU sugar

[1] LMC data on the 2001/2002 crop showed an average world production cost for the raw sugar of USD243.4/t, as against the average price in the Brazilian centre-southern region of USD126.3/t.

trade reform is expected to allow Brazil to expand on third country markets, although Brazilian analysts are rather sceptical about the opportunities that might come from this unilateral policy reform. EU-based sugar companies, on the other hand, have already bought shares in Brazilian sugar mills, indicating their trust in the country's advantages as sugar producer and as producer of (fuel) ethanol in a world with less trade barriers. Further restructuring and expansion of the Brazilian sugar industry will enhance the competitiveness of Brazilian sugar industry.

The output levels of sugar and ethanol will be determined by different factors: the international prices of sugar and oil; the exchange rate; the efficiency of producing both sugar and fuel alcohol, and world demand for environmentally friendly bio-fuels (also influenced by government policy). Estimations about future levels of Brazilian sugar production are therefore difficult to make. The OECD foresees a sugar production growth towards 29.8 million tonnes (in 2008) and an export growth towards 18.5 million tonnes (OECD, 2003). However, analysts of the American agribusiness giant Cargill expect that in 2014 Brazil will provide 60% of the world market with production increasing to 49 million tonnes and exports to 37.1 million tonnes (Agra Europe, 2004). Such projections indicate that Brazil is expected to increasingly dominate the international sugar market.

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Interviews

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Appendix 1 An overview of the Computational Model

A1.1 Introduction

This appendix provides an overview of the basic structure of the global CGE model employed for our assessment of the sugar reforms. The GULA[1] model is implemented in GEMPACK - a software package designed for solving large applied general equilibrium models. The model is solved as an explicit non-linear system of equations, through techniques described by Harrison and Pearson (1994). More information can be obtained at the following URL - http://www.monash.edu.au/policy/gempack.htm. The reader is referred to Hertel (1996: http://www.agecon.purdue.edu/gtap/model/Chap2.pdf) for a detailed discussion of the basic algebraic model structure represented by the GEMPACK code. While this appendix provides a broad overview of the model, detailed discussion of mathematical structure is limited to added features, beyond the standard GTAP structure.

The model is a standard multi-region computable general equilibrium (CGE) model. See Van Tongeren et al., (2001) for a review and assessment of the features of applied agricultural trade models. Social accounting data are based on Version 6 (pre-release 5) of the GTAP dataset (McDougall 2001).

A1.2 General structure

The general conceptual structure of a regional economy in the model is represented in appendix 2. Within each region, firms produce output, employing land, labour, capital, and natural resources and combining these with intermediate inputs. Firm output is purchased by consumers, government, the investment sector, and by other firms. Firm output can also be sold for export. Land is only employed in the agricultural sectors, while capital and labour (both skilled and unskilled) are mobile between all production sectors. Capital is fully mobile within regions.

All demand sources combine imports with domestic goods to produce a composite good, as indicated in the figure, following the well-known Armington approach.

A1.3 Modelling of agricultural supply and land markets

The standard version of GTAP represents land allocation that assumes various types of land are imperfectly substitutable. That is, land is imperfectly mobile across alternative uses. In order to model the agricultural supply response in such a way that it is consistent

[1] Gula is the Bahasa Indonesia word for sugar.

with existing econometric evidence, we have made some specific enhancements to the model, following the work on the OECD GTAPEM model (see Huang et al., 2004)

The revised model covers several types of land more or less suited to various crops. The crops include sugar, grains, oilseeds and other crops. The model distinguishes different types of land in a nested 3-level CET structure.[1] In this way the degree of substitutability of types of land can be varied between the nests. It captures to some extent agronomic features. In general it is assumed that it is relatively easier to change the allocation of land within the Cereal, Oilseed and Protein group, while it is more difficult to move land out of this group into a lower nest, such as into vegetables.

A 1.3.1 Factor Substitution

Factor demand in the standard GTAP model is modelled as a two level process. Primary factors are a CES aggregate of labour, capital, land and natural resources which are combined in fixed proportions with intermediate inputs (Leontief). That is, there is no substitution between intermediate inputs and primary factors of production, while substitution between primary factors is possible. This assumption, common in many computable general equilibrium models, is often used because it reduces considerably the number of parameters required. However, in the context of this analysis, we explicitly model substitutability between purchased farm input intermediates, and between the aggregate intermediates and farm-owned inputs.. The parameters are calibrated to elasticities of substitution taken from the OECD PEM model (Hertel and Keeney 2003).

A 1.3.2 Segmented factor markets: agriculture/non-agriculture

If labour were perfectly mobile across domestic sectors, we would observe equalized wages throughout the economy for workers with comparable endowments. This is clearly not supported by evidence. Wage differentials between agriculture and non-agriculture can be sustained in many countries (especially developing countries) through limited off-farm labour migration (Harris and Todaro 1970). Returns to assets invested in agriculture also tend to diverge from returns to investment in other activities.

To capture these stylized facts, we incorporate segmented factor markets for labour and capital by specifying a CET structure that transforms agricultural labour (and capital) into non-agricultural labour (and capital). This specification has the advantage that it can be calibrated to available estimates of agricultural labour supply response.

We separate market clearing conditions for agriculture and non-agriculture and thus have separate market prices for each of these sets of endowments. The economy-wide endowment of labour (and capital) remains fixed, so that any increase in supply of labour to manufacturing has to be withdrawn from agriculture, and the economy-wide resources constraint remains satisfied. The parameters of this function are calibrated to fit estimates of the elasticity of labour supply reported in OECD (2001). The same procedure is applied to capital.

[1] This is a relatively recent feature of PEM. Earlier versions had a 2-level structure.

A1.4 Taxes and policy variables

Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modelled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where relevant (as indicated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

Trade policy instruments outside sugar are represented as import or export taxes/subsidies. The data on tariffs are taken from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules and from the UNCTAD/World Bank WITS dataset. The mapping of these protection data to bilateral trade data has been a joint effort by the Centre d'études Prospectives et d'information Internationales (CEPII) and the International Trade Centre (WTO/ITC). This database is used to convert tariffs applying to trade in products measured at a very disaggregate level (HS6) into their ad valorem equivalent. The underlying import protection measures include ad valorem tariffs, specific tariffs, quota, tariff rate quota regimes, and anti-dumping duties. An important feature of the dataset is the inclusion of existing trade preferences. See Bouët et al. (2004) for a comprehensive documentation.

A1.5 Agricultural quotas

In the sugar sector in the EU we are dealing with a combination of output quota, which constrain production of sugar beets, bilaterally allocated import quota and ordinary import tariffs. An output quota places a restriction on the volume of production. If such a supply restriction is binding, it implies that consumers will pay a higher price than they would pay in case of an unrestricted interplay of demand and supply. We formulate output quota as a complementarity problem. This formulation allows for endogenous regime switches from a state when the output quota is binding to a state when the quota becomes non-binding. In addition, changes in the value of the quota rent are endogenously determined. Similarly, we model sugar import quota for sugar as a complementarity problem. The modelling of this class of non-continuous policy instruments has been greatly facilitated by the latest release of GEMPACK.

A1.6 Trade and transportation costs

International trade is modeled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by composite services purchased from a global trade services sector, where the

composite 'international trade services' activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data, as reported in version 6 of the GTAP dataset.

A1.7 The composite household and final demand structure

Final demand is determined by an upper-tier Cobb-Douglas preference function, which allocates income in fixed shares to current consumption, investment, and government services. This yields a fixed savings rate. Government services are produced by a Leontief technology, with household/government transfers being endogenous. The lower-tier nest for current consumption is also specified as a Cobb-Douglas. The regional capital markets adjust so that changes in savings match changes in regional investment expenditures. (Note that the Cobb-Douglas demand function is a special case of the CDE demand function employed in the standard GTAP model code. It is implemented through GEMPACK parameter files.)

A1.8 Trade

The basic structure of demand in constant returns sectors is Armington preferences. In Armington sectors, goods are differentiated by country of origin, and the similarity of goods from different regions is measured by the elasticity of substitution.

A1.9 Regions in the model

The GULA model divides the world into distinguishes 12 regions, which are aggregated from the 87 GTAP regions. These are in turn built up from statistics on 226 individual countries or composite regions. The database does not allow us to distinguish all individual countries in the various grouping such as EBA and ACP. The mapping between regions and countries is provided in Appendix 4. We have treated the EU as one regional block and have chosen to concentrate on the enlarged EU27, i.e. a European Union including Bulgaria and Romania.

A1.10 Sectors in the model

Each regional economy in the model distinguishes 7 activities or sectors, focusing on crops and livestock. These are aggregated from the 57 original GTAP sectors. Appendix 3 provides details.

A1.11 Additional data

We have supplemented the database with data on sugar production, consumption and trade in physical units (tonnes) from the ISO Sugar Yearbook 2002 databases. This source provides data for the 63 ISO member countries as well as data for other countries. The ISO statistics have been mapped to the GTAP regional classification.

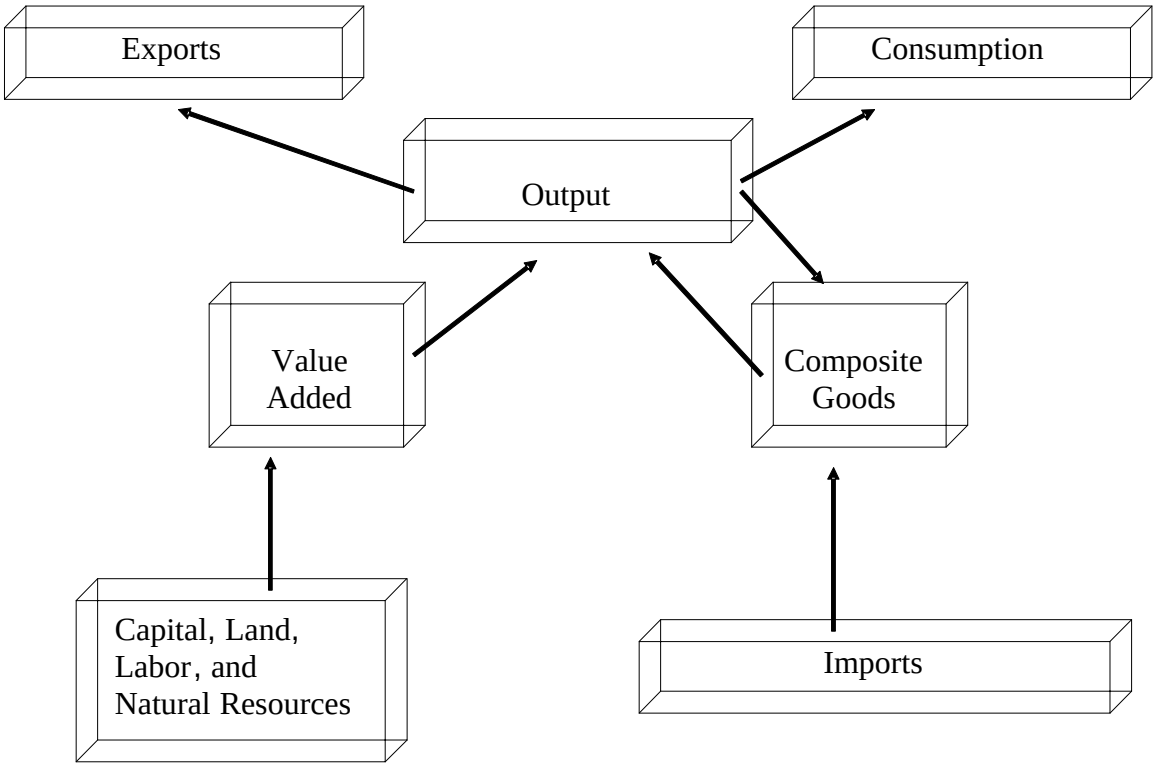
A1.12 Closure

A model needs to be 'closed' by specifying the variable a as either endogenous, i.e. values are determined by the model, or exogenous, i.e. predetermined outside the model. The macroeconomic closure of the GULA model is such that investments accommodate any change in regional savings. Regional savings include domestic savings and inflow of capital from abroad. The latter is captured by allowing the regional trade balances (and hence the savings-investment balance) to adjust. A global bank assures that global savings equal investments and the regional allocation of funds is governed by the movement of expected relative returns to capital.

It is important to realise that the closure specifies as exogenous the regional endowments of capital, land and labour. Exogenous amounts of arable land at the regional level means that additional production of one specific crop can only be realised from reallocating land from other crops. This assumption can be relaxed by introducing an explicit ladsupply function, which relates the amount of supplied arable land to the overall returns to land. Such a long-term structure is, however, not endeavoured in this study.

The model's numeraire is a global factor price index, which is set to unity. All prices are expressed relative to this numeraire.

Appendix 2 The Flow of Production



Appendix 3 Sector

GULA Sector (7)	GTAP sector (57)
Sugar cane, sugar beet:	sugar cane; sugar beet.
Sugar:	sugar.
Grains:	paddy rice; wheat; cereal grains nec.
Oil Seeds:	oil seeds.
Other crops:	vegetables; fruit, nuts; plant based fibers; crops nec.
Livestock and- products:	cattle, sheep, goats, horses; animal products nec; raw milk. *Meat:* cattle, sheep, goats, horses; meat products nec; dairy products.
Other Food and Agriculture:	wool, silk; worm cocoons; Vegetable oils and fats; processed rice; food products nec; beverages and tobacco products.
Rest of the economy:	forestry; fishing; coal; oil; gas; minerals nec; textiles; wearing apparel; leather products; wood products; paper products; publishing petroleum; coal products; chemical, rubber, plastic prods; mineral products nec; ferrous metals; metals nec; metal products; motor vehicles and parts; transport equipment nec; electronic equipment; machinery and equipment nec; manufactures nec; electricity; gas manufacture, distribution; water; construction; trade; transport nec; sea transport; air transport; communication; financial services nec; insurance; business services nec; recreation and other services; pubAdmin/defence/health/education; dwellings.

Appendix 4 Region aggregation scheme

	Sugar model regions (12)	*GTAP regions (87)*	*Member regions (226)*
EU27		European Union 27	Austria; Belgium; Denmark; Finland; France; Germany; United Kingdom; Greece; Ireland; Italy; Luxembourg; Netherlands; Portugal; Spain; Sweden; Bulgaria; Cyprus; Czech Republic; Hungary; Malta; Poland; Romania; Slovakia; Slovenia; Estonia; Latvia; Lithuania.
ACP	ACP sugar protocol countries	Rest of Oceania	American Samoa; Cook Islands; Fiji; French Polynesia; Guam; Kiribati; Marshall Islands; Micronesia, Federated States of Nauru; New Caledonia; Norfolk Island; Northern Mariana Islands; Niue; Palau; Papua New Guinea; Samoa; Solomon Islands; Tokelau; Tonga; Tuvalu; Vanuatu; Wallis and Futuna.
		India	India.
		Rest of Free Trade Area of the Americas	Antigua and Barbuda; Bahamas; Barbados; Dominica; Dominican Republic; Grenada; Haiti; Jamaica; Puerto Rico Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Trinidad and Tobago; Virgin Islands, U.S.
		Rest of the Caribbean	Anguilla; Aruba; Cayman Islands; Cuba; Guadeloupe; Martinique; Montserrat; Netherlands Antilles; Turks and Caicos; Virgin Islands, British .
		Rest of South African Customs Union	Lesotho; Namibia; Swaziland.
		Malawi	Malawi.
		Tanzania	Tanzania, United Republic of
		Zimbabwe	Zimbabwe.
		Rest of Southern African Development Community	Angola; Congo, the Democratic Republic; of the Mauritius; Seychelles.
		Madagascar	Madagascar.
		Uganda	Uganda
EBA	EBA (non ACP) countries	Rest of Southeast Asia	Brunei Darussalam; Cambodia; Lao People's Democratic Republic; Myanmar; Timor Leste.
		Bangladesh	Bangladesh
		Rest of South Asia	Afghanistan; Bhutan; Maldives; Nepal; Pakistan

		Mozambique	
		Zambia	
		Rest of Sub-Saharan Africa	Benin; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African Republic; Chad; Comoros; Congo; Cote d'Ivoire; Djibouti; Equatorial Guinea; Eritrea; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Liberia; Mali; Mauritania; Mayotte; Niger; Nigeria; Reunion; Rwanda; Saint Helena; Sao Tome and Principe; Senegal; Sierra Leone; Somalia; Sudan; Togo.
BRA	Brazil	Brazil	
DC	Sugar dev countries no prefs	Botswana	
		South Africa	
		United States of America	
		New Zealand	
		Japan	
		Korea	
		Canada	
		Mexico	
		Switzerland	
		Rest of EFTA	Iceland; Liechtenstein; Norway.
RUS	Russian Federation & PR China	China	China
CHN		Russian Federation	Russian Federation
MENA	Middle East & North Africa	Turkey	Turkey
		Rest of Middle East	Bahrain; Iran, Islamic Republic of; Iraq; Israel; Jordan; Kuwait; Lebanon; Palestinian Territory, Occupied; Oman; Qatar; Saudi Arabia; Syrian Arab Republic; United Arab Emirates; Yemen.
		Morocco	Morocco
		Tunisia	Tunisia
		Rest of North Africa	Algeria; Egypt; Libyan Arab Jamahiriya
IDN	Indonesia	Indonesia	Indonesia
THAUS	Thailand &Australia	Australia	Australia
		Thailand	Thailand
ROW	All other countries	Hong Kong	Hong Kong
		Taiwan	Taiwan
		Rest of East Asia	Macau; Mongolia; Korea, Democratic People's Republic of
		Malaysia	Malaysia
		Philippines	Philippines
		Singapore	Singapore
		Viet Nam	Viet Nam
		Sri Lanka	Sri Lanka
		Rest of North America	Bermuda; Greenland; Saint Pierre and Miquelon.
		Colombia	Colombia
		Peru	Peru
		Venezuela	Venezuela

Rest of Andean Pact	Bolivia; Ecuador.
Argentina	Argentina
Chile	Chile
Uruguay	Uruguay
Rest of South America	Falkland Islands (Malvinas); French Guiana; Guyana; Paraguay; Suriname.
Central America	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama.
Rest of Europe	Andorra; Bosnia and Herzegovina; Faroe Islands; Gibraltar; Macedonia, the former Yugoslav Republic of; Monaco; San Marino; Serbia and Montenegro.
Albania	Albania
Croatia	Croatia
Rest of Former Soviet Union	Armenia; Azerbaijan; Belarus; Georgia; Kazakhstan; Kyrgyzstan; Moldova, Republic of; Tajikistan; Turkmenistan; Ukraine; Uzbekistan.