



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



ELSEVIER

Agricultural Economics 20 (1999) 105–120

AGRICULTURAL
ECONOMICS

An economic assessment of the Common Market Organization for bananas in the European Union

Hervé Guyomard*, Catherine Laroche, Chantal Le Mouël

*Institut National de la Recherche Agronomique (INRA), Unité d'Economie et de Sociologie Rurales (ESR) de Rennes,
65 rue de Saint-Brieuc, 35042, Rennes cedex, France*

Received 3 September 1996; received in revised form 5 October 1998; accepted 19 November 1998

Abstract

The main objective of this paper is to provide some estimates of how the world banana market has been affected by the Common Market Organization (CMO) for bananas established in the European Union (EU) on 1 July 1993, and modified in April 1994. We quantify the effects of the new EU regulation on world and EU prices, on the structure of EU imports from Latin American countries, African, Caribbean and Pacific (ACP) countries and EU regional suppliers, on the pattern of consumption in the various EU member states, and on consumers' and producers' welfare using a static partial equilibrium model of the world banana market. Simulation results suggest that the two key variables in determining the effects of the CMO are the size of the tariff quota on dollar and non-traditional ACP bananas and the capacity of ACP countries to exhaust their ACP contingent share. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: Banana; European Union; Tariff quota; Welfare

1. Introduction

On 1 July 1993, the European Union (EU) adopted a unified banana policy as part of the completion of the Single European Market (SEM). Before that date, EU member states pursued their own trade regimes. The EU domestic market was thus compartmentalized, allowing Germany to import bananas duty free as a consequence of concessions secured when the Treaty of Rome was signed in 1957 and six other countries (France, Greece, Italy, Portugal, Spain, and the United Kingdom) to protect African, Caribbean and Pacific (ACP) and EU producers through a preferential access

to high prices as well as to a quota and a 20% tariff on bananas from other sources, mainly Latin America.¹ The standard regime, i.e., a common external tariff of 20% on banana imports, ACP and EU exporters being exempt from this duty, applied to only five member states (Belgium, Denmark, Ireland, Luxembourg, and The Netherlands). The overall effect of these disparate arrangements was to raise the cost to the EU consumer of all bananas and to cause prices to be different in each country, and higher than the world market price (see, e.g., Borrell and Cuthberston, 1991; Matthews, 1992; Read, 1994).

*Corresponding author. Tel.: +33-2-99-28-5387; fax: +33-2-99-28-5380; e-mail: hguyomar@roazhon.inra.fr

¹The 'German regime' was the one applied in Austria, Finland and Sweden as well before they joined the EU.

The SEM of 1992 provided the impetus to eliminate internal EU border restrictions since it would be no longer possible to enforce Article 115 of the Treaty of Rome to prevent intracommunity trade. However, as noted by Borrell and Yang (1992), a Common Market Organization (CMO) for bananas in the EU is particularly difficult to define since the EU has to face competing obligations and objectives. Firstly, the CMO must be consistent with all aspects of the SEM. Secondly, it must be compatible with the General Agreement on Tariffs and Trade (GATT), particularly with the objective of maintaining or improving market access. Thirdly, EU commitments giving a preferential access to bananas produced in ACP countries under the Lomé IV Convention must be honored.² Finally, and perhaps most importantly, contradictory interests of EU regional suppliers and EU consumers are an obvious consideration.

The CMO for bananas, as defined in July 1993 (Official Journal of the European Communities, 1994) and revised in April 1994 in Marrakech as part of GATT negotiations, ensures free trade within the EU. Trade provisions of the new regime still allow *traditional* ACP bananas to enter duty free up to 857 700 t.³ Bananas from Latin America and other third world countries are subject to a 75 ECU per ton levy within a quota of 2 million tons in 1993 (2.1 million tons in 1994 and 2.2 million tons in 1995 for the EU with 12 member states, increased up to 2.553 million tons following the enlargement of the EU to Austria, Finland and Sweden).⁴ ACP imports beyond traditional levels, i.e., *non-traditional* imports, enter duty free up to 90 000 t, but count against the quota. Over-quota tariffs are 750 ECU

per ton for non-traditional ACP bananas and 850 ECU per ton for other suppliers, i.e., ‘dollar’ zone suppliers. The tariff quota is managed through a system of import certificates: 66.5% of these certificates are allocated to operators who marketed third country and non-traditional ACP country bananas between 1989 and 1991 (category A operators); 30% of these certificates are allocated to operators who marketed EU or traditional ACP bananas between 1989 and 1991 (category B operators); and 3.5% of these certificates are reserved to newcomers (category C operators).⁵ The allocation of import licenses to operators is determined on the basis of the quantities of bananas marketed, weighted according to the three marketing activities, i.e., primary import (57%), secondary import (15%) and ripening (28%). In addition, following the so-called Framework Agreement (Council Regulation 3290/94 of 22 December 1994), part of the tariff quota is divided up into specific national quotas allocated to four Latin American countries, Costa Rica receiving 23.4% of the quota, Colombia 21.0%, Nicaragua 3% and Venezuela 2.0%.⁶ EU producers are guaranteed a minimum income through a deficiency payment of up to 854 000 t. This volume is divided between the various EU regional suppliers, but quantities are transferable.⁷ The compensation is designed to offset the loss of income resulting from the new regime and the removal of the protection these producers enjoyed under their former national regime. Other elements of the regulation are mainly the setting of common quality and marketing standards for all bananas, and the creation of a Management Committee.

Squaring the circle is not easy. The EU regulation represents a compromise solution which does not satisfy many actors. As a result, it has been the target of complaints from several sources, including EU

²Protocol 5 of the Lomé IV Convention states that “... no ACP country shall be placed, as regards access to its traditional markets and its advantages on those markets, in a less favorable situation than in the past or at present.”

³Ivory Coast 155 000 t, Cameroon 155 000 t, St. Lucia 127 000 t, Jamaica 105 000 t, St. Vincent and the Grenadine 82 000 t, Dominica 71 000 t, Somalia 60 000 t, Belize 40 000 t, Surinam 38 000 t, Grenada 14 000 t, Madagascar 5900 t, and Cape Verde 4800 t.

⁴It is worth mentioning that there was no modification of Council Regulation 404/93 to take account of the accession of Austria, Finland and Sweden to the EU. In 1995, 1996 and 1997, the Commission used its prerogative to open an additional tariff quota of 353 000 t.

⁵As noted by, e.g., Swinbank (1996), traditional shippers of ACP and EU bananas are allocated with 30% of the import licenses with the clear intent that the ‘extra’ profits they could earn by shipping dollar zone bananas or selling the import licenses to dollar zone shippers should be used to cross-subsidize their ACP or EU operations.

⁶In return, these four suppliers agreed to take no further action on a GATT panel against the EU banana regime.

⁷Canary Islands 420 000 t, Guadeloupe 150 000 t, Martinique 219 000 t, Madeira 50 000 t and Crete 15 000 t.

member states, ACP and Latin American countries, distribution and marketing companies and the United States (for a synthesis of these complaints, see Thagesen and Matthews, 1997). Germany argues that the new policy will increase the price of bananas on the German market. For the five EU member states which applied the common external tariff of 20%, it is also possible that the level of protection will increase under the new regime. Latin American producers also have challenged the CMO arguing that the latter implied a significant loss of their market share in the EU and that the system of quotas prevented them from increasing their exports in the future. Furthermore, they fear that a restrictive policy in the EU means more bananas on the world market and hence, a decrease in the world price. Following the Uruguay Round Framework Agreement, the market share and the ‘advantages’ reserved to ACP countries have been reduced with respect to the proposal of July 1993. ACP producers now fear that they are not competitive enough on the EU market with respect to dollar bananas and argue that Lomé IV Convention commitments are not honored.

In April 1996, the United States along with Guatemala, Honduras, Mexico and Ecuador filed a second complaint to the World Trade Organization (WTO) over the EU banana regime, claiming the system is unfair to Latin American producers by favoring bananas from ACP countries. These five countries mainly challenged the conformity with WTO rules of the category B licenses and of the system of calculating reference quantities. The WTO Appellate Body issued its report in September 1997. To a large extent, it upheld all of the unfavorable (at least from the EU Commission’s point of view) findings of the Panel report issued in May 1997, the licensing system, the activity function rules (i.e., the allocation of import certificates to primary importers, secondary importers and ripeners) and several aspects of the Framework Agreement being considered inconsistent with non-discrimination and national treatment provisions of the GATT and of the GATS (General Agreement on Trade and Services). Contrary to the panel, the Appellate Body finds that the Lomé Waiver does not cover Article XIII of the GATT on the allocation and management of tariff quotas. Nevertheless, it also indicates that the EU can provide tariff preferences for traditional and non-traditional ACP exports covered by the

Lomé Waiver.⁸ Finally, it does not rule out the size of the tariff quota as bound in the Uruguay Round (2.2 million tons for the EU with 12 member states) and the income support to EU domestic producers. In order to comply with the WTO ruling, the Commission has proposed a series of changes to the regime, including the abolition of the system of reserving 30% of import certificates to category B operators and the suppression of the system of granting a share of the tariff quota on a country-by-country basis. The Commission intends to make up for the loss to ACP suppliers by granting them direct aid and proposes to open an additional tariff quota of 353 000 t, at a duty of 300 ECU per ton, to take account of the accession of Austria, Finland and Sweden which joined the EU in 1995.⁹ At the present time, many elements of the 1998 Commission proposal to bring the regime in line with the WTO ruling are still uncertain, and further reflection will be necessary as to their exact meaning and implications.

The main purpose of this paper is to compare the EU pre-CMO banana policy with the EU banana policy of ‘1993–1994’ in order to analyze the various effects of the ‘1993–1994’ CMO and to determine ‘the likely losers and winners’. We quantify the effects of the EU regulation on world and EU prices, on the structure of EU imports from Latin American countries, ACP states and EU regional suppliers, and on the pattern of consumption in the various EU member states. The welfare analysis allows us to determine the likely losers and winners from the CMO. The model used is a competitive static partial equilibrium model of the world banana market. The adopted modeling framework follows those of existing models of the world

⁸The Appellate Body “reverses the findings of the Panel that the Lomé Waiver waives any inconsistency with Article XIII:1 of the GATT 1994 to the extent necessary to permit the European Communities to allocate tariff quota shares to traditional ACP States”, but it “upholds the findings of the Panel that the European Communities is ‘required’ under the relevant provisions of the Lomé Convention to: provide duty-free access for traditional ACP bananas, provide duty-free access for 90 000 t of non-traditional ACP bananas, provide a margin of tariff preference in the amount of 100 ECU per ton for other non-traditional ACP bananas, allocate tariff quota shares to the traditional ACP States in the amount of their pre-1991 best-ever export volumes, ..., provide preferential tariff treatment for non-traditional bananas, ...”.

⁹For a first analysis of the Commission proposal, see Tangermann (1998).

banana trade (Matthews, 1992; Borrell and Yang, 1990, 1992; Read, 1994). Relative to these models, the main ‘originality’ of our modeling framework lies in the world market clearing mechanism. More precisely, as the preferential access provided by the EU to some exporting countries actually plays an active role in determining the world banana price equilibrium, both before and after the CMO implementation, these favored trade flows are explicitly taken into account in the market clearing process.

This paper is organized as follows. Section 2 outlines the multi-country banana trade model used to evaluate the price, production, consumption, trade and welfare impacts of the ‘1993–1994’ CMO for bananas in the EU. Section 3 analyzes the empirical results. Attention is focused on two key elements, i.e., the capacity of ACP countries to exhaust their ACP contingent shares and the size of the tariff quota on dollar and non-traditional ACP bananas. Section 4 concludes.

2. A policy simulation model of the world banana market

The simulations reported in this paper are carried out with a single-commodity, multi-country partial equilibrium model of the world banana market. The model includes four importing zones within the EU and the Rest of the World (ROW). On the export side, it distinguishes between EU regional suppliers, preferred exporters and other exporters. The type of importer *i* is defined on the basis of its status in the pre-CMO regime. Countries of type *a* (France, Greece,

Portugal and Spain) provided a preferential access to their favored suppliers (French overseas territories, i.e., Guadeloupe and Martinique, in the case of France, Crete in the case of Greece, Madeira in the case of Portugal, and the Canary Islands in the case of Spain) at a fixed price and used a quota to limit their imports from other sources. Countries of type *b* (Italy and the United Kingdom) provided a preferential access to some ACP suppliers (Somalia in the case of Italy, and Belize, Jamaica, Surinam and the Windward Islands in the case of the United Kingdom) and protected their market by a quota on dollar bananas in addition to the 20% common external tariff. Countries of type *c* (the three Benelux countries, Denmark and Ireland) applied the 20% tariff on dollar zone imports and otherwise allowed for the unrestricted access of bananas. In countries of type *d* (Austria, Finland, Germany and Sweden), bananas entered free of duty. In the same way, the type of an exporter *j* is defined on the basis of its status in the pre-CMO regime. EU regional suppliers are denoted by *x*, preferred ACP exporters are denoted by *y*, and non-preferred exporters, mainly Latin American countries, are denoted by *z*. Trade is assumed to be free in the ROW. Importing and exporting zones distinguished in the model are shown in Table 1.

2.1. Model outline

In very general terms, the model consists of seven demand equations and seven supply equations which are written as constant-elasticity functions. Import CIF prices in importing countries and export FOB prices in exporting countries are linked by constant

Table 1
Importing and exporting zones distinguished in the model

Importer <i>i</i>		Exporter <i>j</i>	
Country	Type	Country	Type
France	<i>a</i>	French overseas territories	<i>x</i>
Greece, Portugal, Spain	<i>a</i>	Canary Islands, Crete, Madeira	<i>x</i>
Italy	<i>b</i>	Somalia	<i>y</i>
United Kingdom	<i>b</i>	Jamaica, Windward Islands	<i>y</i>
Benelux, Denmark, Ireland	<i>c</i>	Cameroon, Ivory Coast	<i>y</i>
Germany	<i>d</i>	Other ACP countries	<i>y</i>
Austria, Finland, Sweden	<i>d</i>		
Rest of the World	<i>e</i>	Other countries (dollar zone)	<i>z</i>

Note: The type of an importer *i* or an exporter *j* is defined on the basis of its status in the pre-CMO regime.

Table 2
Notations and variable definitions

Symbol	Definition
D_i^i	The quantity demanded by importer i ($i = a, b, c, d, e$)
p^i	The CIF import price in country i
t_i	The ad-valorem tariff applied by country i
T_i	The fixed levy applied by country i
η_i	The price elasticity of import demand in country i
a_i	The constant parameter of the import demand function for country i
S_j	The quantity supplied by exporter j ($j = x, y, z$)
px_j	The FOB export price in country j
ε_j	The price elasticity of export supply in country j
b_j	The constant parameter of the export supply function for country j
c_j^i	The cost coefficient between imports of country i and exports of country j , i.e., $p^i = px_j + c_j^i$
\bar{p}_j^i	The support (CIF import) price offered by importer i to exporter j
\bar{D}_j^i	The quantity imported by country i from supplier j when the latter benefits from a price support from country i
\bar{p}	The common CIF import price on the EU market in the CMO regime
D_j^i	The quantity imported by country i from supplier j
S_j^i	The quantity exported by supplier j to country i
Q	The tariff quota on dollar and non-traditional ACP bananas in the CMO regime

margin equations. The market-clearing equation guarantees the supply–demand equilibrium on the world market. Notations are detailed in Table 2.

2.1.1. Modeling the pre-CMO policy

In order to duplicate the workings of national banana policies in the pre-CMO regime, three demand markets in the EU are distinguished, i.e. quota-protected markets (type a and b countries), tariff-protected markets (type c countries) and non-protected markets (type d countries).

The highest support price offered by a type a or b importer i to a type x or y favored supplier j is denoted \bar{p}_j^i . This support price is fixed and it determines the import price for all bananas on this quota-protected market i . Hence, $\bar{p}_j^i = \bar{p}^i, \forall j$. Import demand functions of quota-protected countries of type a or b may thus be written as:

$$D^a = a_a (\bar{p}^a)^{\eta_a} \quad (1)$$

$$D^b = a_b (\bar{p}^b)^{\eta_b} \quad (2)$$

For tariff-protected member states of type b, import demand functions are:

$$D^c = a_c (p_z^c (1 + t_c))^{\eta_c} \quad (3)$$

For free of duty member states of type c and for the ROW, import demand functions are simply:

$$D^d = a_d (p_z^d)^{\eta_d} \quad (4)$$

$$D^e = a_e (p_z^e)^{\eta_e} \quad (5)$$

In the same way, three groups of exporting countries are distinguished on the supply side: EU regional suppliers x, preferred ACP producers y and non-preferred exporters z (more simply, dollar zone exporters).

Let us first consider the case of an EU regional supplier j which benefits from an export support price at level \bar{p}_j^1 (i.e., $\bar{p}_j^1 = \bar{p}_j^1 - c_j^1$) from various importers $i, i \in I(j)$ where $I(j)$ represents the subset of type a and b importers i which guarantee a fixed support price to this supplier j . At this stage, it is useful to order importing countries i according to the price they offer to supplier j such that $\bar{p}_j^1 > \bar{p}_j^2$ means that the highest-price countries come first. Therefore, if at price level \bar{p}_j^1 , imports of country 1 from supplier j (i.e., \bar{D}_j^1) are greater than the export supply of country j (i.e., $b_j (\bar{p}_j^1 - c_j^1)^{\varepsilon_j}$), then the shortfall on market 1 will be made up by imports from other preferred suppliers (if any), ACP countries (if they are competitive with respect to dollar bananas at this price level) and/or Latin American suppliers. On the contrary, if at this price level \bar{p}_j^1 , the export supply of country j exceeds import demand of country 1, the latter will import from this preferred supplier only. The ‘residual’ export supply of country j will be exported to other markets, first to other price-supported markets at decreasing

prices $\bar{p}_j^2, \dots, \bar{p}_j^{1(j)}$, and second to non-price-supported markets if country j is competitive with respect to dollar banana suppliers. The export supply function of an EU regional supplier x in the pre-CMO regime may thus be written as (import prices on non-price-supported markets are also ordered, and we assume that: $p_x^e - c_x^e < p_x^d - c_x^d < p_x^c - c_x^c$):¹⁰

$$\begin{aligned} S_x &= b_x(\bar{p}_x^1 - c_x^1)^{\varepsilon_x} \quad \text{when } \bar{D}_x^1 \geq S_x^1 = b_x(\bar{p}_x^1 - c_x^1)^{\varepsilon_x} \\ S_x &= b_x(\bar{p}_x^2 - c_x^2)^{\varepsilon_x} \quad \text{when } \bar{D}_x^1 + \bar{D}_x^2 \geq (S_x^1 + S_x^2) \\ &= b_x(\bar{p}_x^2 - c_x^2)^{\varepsilon_x} \geq \bar{D}_x^1 \\ S_x &= \dots \\ S_x &= b_x(p_x^c - c_x^c)^{\varepsilon_x} \quad \text{when } \sum_{i \in I(x)} \bar{D}_x^i + D_x^c \\ &\geq \sum_{i \in I(x)} S_x^i + S_x^c = b_x(p_x^c - c_x^c)^{\varepsilon_x} \geq \sum_{i \in I(x)} \bar{D}_x^i \\ S_x &= \dots \\ S_x &= b_x(p_x^e - c_x^e)^{\varepsilon_x} \quad \text{when } \sum_{i \in I(x)} S_x^i + S_x^c + S_x^d + S_x^e \\ &= b_x(p_x^e - c_x^e)^{\varepsilon_x} \geq \sum_{i \in I(x)} \bar{D}_x^i + D_x^c + D_x^d \end{aligned} \quad (6)$$

Export supply functions of ACP countries are obtained in a similar way:¹¹

$$\begin{aligned} S_y &= b_y(\bar{p}_y^1 - c_y^1)^{\varepsilon_y} \quad \text{when } \bar{D}_y^1 \geq S_y^1 = b_y(\bar{p}_y^1 - c_y^1)^{\varepsilon_y} \\ S_y &= \dots \\ S_y &= b_y(p_y^e - c_y^e)^{\varepsilon_y} \quad \text{when } \sum_{i \in I(y)} S_y^i + S_y^c + S_y^d + S_y^e \\ &= b_y(p_y^e - c_y^e)^{\varepsilon_y} \geq \sum_{i \in I(y)} \bar{D}_y^i + D_y^c + D_y^d \end{aligned}$$

Finally, the export supply function of dollar zone producers is simply:

$$S_z = b_z(px_z)^{\varepsilon_z} \quad (8)$$

The world market equilibrium equation defines the world FOB price of bananas, i.e.,

$$\begin{aligned} a_a(\bar{p}^a)^{\eta_a} + a_b(\bar{p}^b)^{\eta_b} + a_c((px_z + c_z^c)(1 + t_c))^{\eta_c} \\ + a_d(px_z + c_z^d)^{\eta_d} + a_e(px_z + c_z^e)^{\eta_e} = S_x + S_y + S_z \end{aligned} \quad (9)$$

¹⁰Obviously $\bar{p}_x^i = \bar{p}^i, \forall i$ and $p_x^k = p^k, \forall k = c, d, e$.

¹¹Obviously $\bar{p}_y^i = \bar{p}^i, \forall i$ and $p_y^k = p^k, \forall k = c, d, e$.

where S_x, S_y and S_z are given by Eqs. (6)–(8), respectively.

The model simultaneously determines the world FOB price of bananas (Eq. (9)), the CIF import prices of bananas in type c, d and e importing countries (via margin equations), the exported quantity by each supplier j (Eqs. (6)–(8)), and the imported quantity by each purchaser i (Eqs. (1)–(5)).

2.1.2. Modeling the CMO policy

In order to simplify the presentation, we will only consider the case where the tariff quota in the EU on dollar banana imports is binding. The export supply function of dollar zone producers is still given by Eq. (8) and the import demand function of the ROW remains Eq. (5). The supply–demand equilibrium equation on non-EU markets defines then the world FOB price of dollar bananas, i.e.,

$$D^e + Q = S_z, \text{ i.e., } a_e(px_z + c_z^e)^{\eta_e} + Q = b_z(px_z)^{\varepsilon_z} \quad (10)$$

Import demand functions in the various EU member states depend on the common demand price p in the EU, i.e.,

$$D^i = a_i(p)^{\eta_i}, \quad i = a, b, c, d \quad (11)$$

Under the assumption that the deficiency payment is perceived as coupled and that it exactly offsets the support price decrease, export supply functions of EU regional suppliers x may be written as:¹²

$$\begin{aligned} S_x &= b_x(\bar{p}_x^1 - c_x^1)^{\varepsilon_x} \quad \text{when } \bar{D}_x^1 \geq S_x^1 = b_x(\bar{p}_x^1 - c_x^1)^{\varepsilon_x} \\ S_x &= \dots \\ S_x &= b_x(p - c_x^c)^{\varepsilon_x} \quad \text{when } \sum_{i \in I(x)} \bar{D}_x^i + D_x^c \\ &\geq \sum_{i \in I(x)} S_x^i + S_x^c = b_x(p - c_x^c)^{\varepsilon_x} \geq \sum_{i \in I(x)} \bar{D}_x^i \\ S_x &= b_x(p - c_x^d)^{\varepsilon_x} \quad \text{when } \sum_{i \in I(x)} S_x^i + S_x^c + S_x^d \\ &= b_x(p - c_x^d)^{\varepsilon_x} \geq \sum_{i \in I(x)} \bar{D}_x^i + D_x^c \end{aligned} \quad (12)$$

¹²We assume the same price order as in the pre-CMO regime. We will relax the assumption of an exact compensation of the support price decrease in the empirical analysis. It is adopted here for simplicity.

Export supply functions of ACP countries are:

$$\begin{aligned}
 S_y &= b_y(p - c_y^l)^{\varepsilon_y} \quad \text{when } D_y^l \geq S_y^l = b_y(p - c_y^l)^{\varepsilon_y} \\
 S_y &= \dots \\
 S_y &= b_y(p - c_y^d)^{\varepsilon_y} \quad \text{when } \sum_i S_y^i = b_y(p - c_y^d)^{\varepsilon_y} \\
 &\geq \sum_{i=1}^{I-1} D_y^i \quad (13)
 \end{aligned}$$

The demand–supply equilibrium equation in the EU defines then the common demand price p on EU markets, i.e.,

$$\sum_{i=a,b,c,d} D^i = Q + S_x + S_y \quad (14)$$

2.2. Model initialization

Value and volume bilateral trade flows (i.e., exports of supplier j to importer i and imports of purchaser i from exporter j) are based on FAO and EUROSTAT data. FOB and CIF unit values are derived from these volume and value data. Base period data used for the calibration correspond to a 1989–1991 average and is given in Table 3. Although most recent data related to the pre-CMO situation (i.e., 1992) is available, a 1989–1991 average has been chosen for one reason. 1992 figures clearly show that dollar banana imports in the EU increased substantially in 1992 (see Table 6 below). Even if the German Unification may explain a part of this increase, some observers have raised the question of whether the dollar banana supplies flooded the market in 1992, as it is generally expected when a quota is to be introduced (EuroPA and Associates, 1995; Rastoin and Loeillet, 1995). In fact, if import licenses are allocated on the basis of past quantities, each importer has an incentive to import more in order to stake claim to future quota rents. Therefore, as 1992 data cannot be considered as ‘representative’ of the pre-CMO market situation due to this ‘speculative’ trade, the 1989–1991 average has been chosen for the base period. However, it is important to note that all empirical results depend on the choice of the base period. It is clear that the impact of the CMO is closely related to the status of the tariff quota level, i.e., lower, equal or higher than EU dollar banana imports in the pre-CMO situation.

Supply and demand elasticities used in the simulation exercises are shown in Table 4. Following Borrell and Yang (1992), the price elasticity is set at 1.0 for EU regional suppliers and ACP countries while it is set at 2.0 for dollar zone producers. The responsiveness of export supply to prices in the dollar zone is thus assumed to be very high, mainly because (i) plantations do not operate at the limit of output capacity, (ii) the proportion of fruit rejected on quality grounds can be varied within limits, and (iii) the banana vessels on voyages to export ports in Central and South America can usually make up shortfalls which occur in any one location from adjacent sources of supply (FAO, 1986). In the case of EU regional and ACP suppliers, the availability of land is not so great and supply elasticities have been set at half those of dollar zone producers. Import demand elasticities range between -0.3 for the ROW to -1.0 for Italy and the United Kingdom. For some EU member states (Denmark, France, Italy and the United Kingdom), it has been possible to estimate econometrically import price demand elasticities. For other countries, elasticity estimates are derived from the literature. The FAO study (FAO, 1986) estimated price elasticities of demand at retail ranking from -0.11 (United States) to -0.84 (the Netherlands), with a weighted price elasticity for the countries analyzed in the study of -0.30 . Islam and Subramaniam (1988) found price elasticities of import demand ranking between -0.3 and -0.4 . The Overseas Development Institute (Davenport and Page, 1991) and Kersten (1995) used an EU demand elasticity of -0.5 while Matthews (1992) used a slightly lower value of -0.4 .

3. Simulating the impact of the EU common market organization for bananas

The model was first run to generate base estimates of price, net export and net import levels under the pre-CMO policy for the base period (baseline scenario). A second run of the model was made to generate the levels of the same endogenous variables if the ‘1993–1994’ CMO policy was enacted (CMO scenario).

The baseline scenario represents an attempt to structurally duplicate the base period price and quantity data observed under the pre-CMO policy regime. In order to save space, the results of this first scenario

Table 3
Base period data used for the model calibration (quantities in tons, prices in ECU per ton)

Exporter j	Importer i								Total	FOB unit value
	France	South of the EU (except Italy)	Italy	United Kingdom	Benelux, Denmark, Ireland	Germany	Austria, Finland, Sweden	Rest of the World		
French overseas territories	291944	12	261	1323	41	81	0	0	293 662	403
Canary Islands, Crete, Madeira	45	414348	1	11	0	480	0	0	414884	560
Cameroon, Ivory Coast	170226	107	7953	2759	290	92	0	0	181427	254
Somalia	0	12897	28763	0	124	0	0	0	41783	272
Jamaica, Windward Islands	179	7269	23600	276395	105	125	0	0	307672	433
Other ACP countries	0	122	0	51697	58	0	2842	0	54718	294
Other countries	15325	98566	371874	60601	364589	1162468	355118	4408705	6837246	211
Total	477719	533319	432452	392786	365208	1163245	357959	4408705		
CIF unit value (20% tariff on dollar bananas included)	709	624	521	648	460	477	511	292		

Table 4
Import demand and export supply elasticities used in the simulation exercises

Demand		Supply	
Country	Elasticity	Country	Elasticity
France ^a	−0.7 (−0.70 [22.08])	French overseas territories	1
South of Europe ^c (Greece, Portugal and Spain)	−0.7	Canary Islands, Crete and Madeira	1
Italy ^a	−1.0 (−1.07 [5.31])	Somalia	1
United Kingdom ^a	−1.0 (−1.09 [5.13])	Jamaica and Windward Islands	1
Benelux, Denmark and Ireland ^{a, b}	−0.4 (−0.73 [3.53])	Cameroon and Ivory Coast	1
Germany, Austria, Finland and Sweden ^c	−0.4	Other ACP countries	1
Rest of the World ^c	−0.3	Other countries, i.e., dollar producers	2

^a In brackets, econometric estimates with the associated *t*-Student.

^b Estimation for Denmark only.

^c Assumed.

are not presented. They are available from the authors upon request. The important point to note is that the baseline scenario solutions are within <2% of observed values in the base period. Accordingly, the empirical results of the CMO scenario are directly compared to the observed data for the base period. Detailed simulation results for the CMO scenario are shown in Table 5. Panel (a) depicts the impact of the CMO upon EU member states, panel (b) describes the effects upon ACP exporting countries and EU regional suppliers, and panel (c) shows the impact upon dollar zone producers and the Rest of the World market.

Before going through the details of the various effects of the CMO policy, the following remark is necessary. The CMO scenario assumes that the direct aid to EU producers is fully coupled or, in other words, that the effective price taken into account by these producers in their profit-maximizing program is the FOB price plus the direct aid per ton. Furthermore, the direct aid is set ex-ante. As a result, exports from EU producers would increase (respectively, decrease) if the final equilibrium effective price is greater (respectively, lower) than the initial support FOB price.¹³

It is of interest to first analyze the effects of the CMO on the EU market as a whole. The tariff quota of 2.553 million tons on dollar and non-traditional ACP bananas would lead the EU banana market to expand by 72 415 t and the average price in the EU to increase

by 2.1 ECU, total imports increasing by around 1.95% compared to the base period and the CIF common price in the EU being 0.4% higher than the average price in the base period. The welfare effect for the EU on the move from the pre-CMO regime to the '1993–1994' CMO policy would encompass a welfare gain for EU consumers of 10.82 million ECU. A limited number of studies have examined the economic consequences of the '1993–1994' CMO for bananas in the EU. Their conclusions differ. For Borrell (1994), the CMO would lead to a welfare loss of 560 million ECU for EU consumers. Similar conclusions are drawn by Kersten (1995) who states that EU consumers would suffer from a welfare loss of 916 million ECU. By contrast, Read (1994) finds that EU consumers would benefit from a 90 million ECU welfare gain. Differences arise because different choices are made concerning the base year import levels against which the tariff quota is compared, whether or not changes in marketing margins are taken into account, and the use of different price data (Thagesen and Matthews, 1997). In particular, it appears that if our model was calibrated with 1991 or 1992 data, pre-CMO imports in the EU from the dollar zone would be higher than the tariff quota of 2.553 million tons. As a result, EU consumers would suffer from a welfare loss with respect to the 1991 or 1992 base periods.

Import and price changes vary significantly among EU member states. Consumers in type c and d countries would suffer from a substantial welfare loss to the extent that the common price under the CMO policy is expected to be much higher than corresponding pre-CMO prices. In type c countries, the price is estimated

¹³ Guyomard et al. (1997) simulate the effects of the '1993–94' CMO under the alternative assumption that the direct aid to EU producers offsets exactly the (support) FOB price cut.

Table 5

Main effects of the '1993–94' Common Market Organization for bananas in the European Union (tariff quota of 2.553 million tons for the EU with 15 member states, deficiency payment to EU producers set ex-ante)

	Base data		Simulation results		
	Imports (tons)	CIF import average price (ECU/ton)	Imports (tons)	CIF common price in the EU (ECU/ton)	Welfare change (million ECU)
<i>Panel a. Impact upon EU importing countries</i>					
France	477719	709	567727	554.05	81.18
Greece, Portugal, Spain	533319	624	579604	554.05	38.90
Italy	432452	521	406654	554.05	–13.94
United Kingdom	392786	648	460109	554.05	40.05
Benelux, Ireland, Denmark	365208	460	338829	554.05	–33.18
Austria, Finland, Sweden	357959	511	346563	554.05	–15.17
Germany	1163245	477	1095616	554.05	–87.02
EU	3722688	552	3795103	554.05	10.82
	Base data		Simulation results		
	Exports (tons)	FOB export average price (ECU/ton)	Exports (tons)	FOB export average price (ECU/ton)	Welfare change (million ECU)
<i>Panel b. Impact upon exporting countries (ACP and EU territories)</i>					
French overseas territories	293662	403	309279	217.05	6.46
Canary Islands, Crete and Madeira	414884	560	464842	420.05	29.67
Somalia	41783	272	55616	362.05	3.40
Jamaica and Windward Islands	307672	433	225284	317.05	–30.10
Cameroon and Ivory Coast	181427	254	123607	173.05	–12.34
Other ACP countries	54718	294	63475	341.05	2.78
Total	1294146		1242103		–0.13
	Base data		Simulation results		
	Exports (tons)	FOB export average price (ECU/ton)	Exports (tons)	FOB export average price (ECU/ton)	Welfare change (million ECU)
<i>Panel c. Impact upon dollar banana producers and the Rest of the World</i>					
Dollar zone exports (tons)					
To the EU	2428541		2553000		
To the ROW	4408705		4371599		
Total	6837246		6949600		
Dollar zone FOB average price (ECU/ton)	211		212		

to increase by 20.5% and consumers would suffer from the adoption of the regime by more than 33 million ECU. The principal loser would be the type d countries, in particular Germany, with the new policy causing prices to increase by 16.2% and consumers' welfare to decrease by 87 million ECU. One type b country, namely Italy, would also suffer from the CMO policy by around 14 million ECU. This result may be explained as follows. The objective of the pre-CMO policy in Italy was to protect the market for Somalian exports, but the latter's share was small (6.7% in the base period) and the bulk of the market was supplied by dollar bananas. As a result, the pre-

CMO CIF import price in Italy was much lower than in the other type b country (i.e., the United Kingdom) or in type a countries, and the CMO policy leads thus to an increase in the Italian price. As expected, the estimated changes in banana imports in the United Kingdom and in type a countries are positive. As a result, consumers' welfare increases in these EU member states. The principal beneficiary would be France where prices would decrease by 21.9%, imports increase by 18.8% and consumers' surplus expand by 81 million ECU. On balance, there would be a relatively small increase in EU consumers' surplus of 11 million ECU.

Table 6
EU banana imports by origin, 1989–1994, in tons (EU with 12 member states)

Origin	1989	1990	1991	1992	1993	1994
EU regional suppliers	808815	826292	780593	794784	743334	645174
ACP countries, incl.	544439	621863	602776	689713	748106	722546
Belize	26580	24040	19616	28493	38517	46980
Cameroon	56071	77628	115841	110714	146901	154034
Ivory Coast	85159	95159	116425	146265	161257	148880
Dollar banana producers	1716932	2024253	2389713	2412897	2153263	1963883
					(1)	(2)
Not determined					68344	118738
Total	3070186	3472408	3773082	3897394	3713047	3450341

Source: European Commission, DG VI, Report on the Operation of the Banana Regime, 1995. For the years 1989–1991, European Commission data differ slightly from EUROSTAT data (COMEXT database) used in this study (see Table 3).

(1) The CMO came into effect on 1 July 1993. Imports from the dollar zone were equal to 1.18 million tons for the first semester of 1993. The quota for the second semester of 1993 was set at 1.1 million tons, but imports were slightly lower than this quantity (966 000 t).

(2) The tariff quota was set at 2.1 million tons for 1994 and 2.2 million tons for 1995 for the EU with 12 member states.

The model projects a world FOB price of bananas of 212 ECU per ton in the dollar zone (+0.5% compared to the base period level). The decrease in ROW imports from the dollar zone is almost negligible (−0.8%). Total exports of dollar bananas increase (from 6.837 million tons to 6.950 million tons) as the tariff quota in the EU opens imports of dollar bananas more than the total of pre-CMO national policies: the level of 2.553 million tons is greater than base period imports of dollar bananas in the EU (2.429 million tons).¹⁴ The over-quota tariff is clearly prohibitive. As a result, over-quota imports equal zero.

As compensation to EU producers applies to a maximum quantity of bananas much higher than pre-CMO exports of EU regional suppliers (854 000 t to compare with the highest level of shipment over the past 10 years, 659 836 t in 1992), EU producers are guaranteed ‘effective’ prices (i.e., price plus direct aid per ton) greater than the support prices they received in the pre-CMO regime. The quantity exported to the EU by community regional suppliers increases by 5.3% for French overseas territories and 12.0% for the Canary Islands, Crete and Madeira.

The CMO allows traditional ACP bananas to enter the EU duty free up to 857 700 t. Simulation results presented in Table 5, panel (b), show that ACP countries would not be able to totally exhaust this con-

tingent, traditional ACP exports decreasing from 585 600 to 467 982 t. In that particular case, the choice of 1991 or 1992 as the base year would not change this conclusion to the extent that observed values for these years are still much lower than the contingent limit (see Table 6).

The new EU banana regime is based on a tariff quota for dollar and non-traditional ACP bananas and on the concept of partnership between trade in EU and ACP bananas on the one hand and dollar bananas on the other hand (European Commission, 1994). It is generally recognized that ACP countries are less efficient than Latin American suppliers (Hallam and McCorriston, 1992). Furthermore, dollar bananas are commonly perceived as being of better and more regular quality than bananas from other sources. A fixed percentage (30%) of the tariff quota is thus allocated to operators (category B operators) on the basis of their past trade in EU and ACP traditional bananas in order to keep the trade in these bananas alive. Our simulation results suggest that ACP countries would have difficulties in taking full advantage of the new EU regulation in penetrating EU markets, and particularly type c and d country markets where pre-CMO import shares of ACP producers were almost negligible. This is confirmed, at least partially, by figures shown in Table 6 although traditional ACP banana exports to the EU have considerably increased in 1993 and 1994 compared with the base period levels (+162 506 and +136 946 t, respectively), the order of

¹⁴As noted before, empirical results closely depend on the choice of the base period for comparison.

magnitude of increases being much lower if 1992 is used as the comparison year (+32 833 t from 1992 to 1994, i.e., +4.8%).

Empirical results presented in Table 5 do not take into account the increase in productivity and production observed in some ACP countries after the implementation of the CMO. According to FAO (1994), new investments made in 1992 would allow some ACP countries (Belize, Cameroon, and Ivory Coast) to fulfill their share of the global ACP contingent. This result may also be explained by complementary factors. Firstly, some ACP producers may have used receipts on selling licenses as a ‘coupled’ transfer which have increased the profitability of their exports with respect to dollar bananas on the EU market. Secondly, the devaluation of the CFA Franc has clearly improved the competitiveness of some ACP countries, Cameroon and Ivory Coast in particular. The consequences of a productivity increase in some ACP countries may be analyzed by reducing exogenously production costs in these countries, i.e., by increasing their relative efficiency with respect to dollar bananas (and hence, also with respect to other ACP countries and EU suppliers). In the model, this possibility is implemented by adding an exogenous shifter in supply equations for the three considered ACP countries so that Belize, Cameroon and Ivory Coast could exhaust their contingent share. Results of this scenario, called ‘CMO scenario + productivity increase in some ACP countries’, are shown in Table 7.

The single EU banana price is estimated to be 4.9% lower in the ‘modified’ CMO scenario than in the

‘initial’ CMO scenario (527.1 ECU per ton and 554.1 ECU per ton, respectively), while EU consumers’ welfare gains are now as large as 115.6 million ECU. Total EU banana imports are increasing by 121 400 t with respect to corresponding import levels in the ‘initial’ CMO scenario. By comparing columns 3 and 4 of Table 7, one easily verifies that EU imports from ACP countries increase by a smaller amount than export increases of Belize, Cameroon and Ivory Coast. This result is due to the fact that other ACP countries now face a relative competitive disadvantage compared with the three ACP countries where productivity has just increased. As a result, exports from other ACP countries will diminish in the ‘modified’ CMO scenario with respect to the ‘initial’ CMO scenario.

The analysis of this section clearly shows that two key factors in determining the effects of the CMO for bananas in the EU are, (i) the capacity of traditional ACP countries to exhaust their share of the traditional ACP contingent and (ii) the size of the tariff quota relative to the quantity of dollar and non-traditional ACP bananas imported in the pre-CMO situation. In practice, these two points are closely linked.

The sensitivity of selected endogenous variables to the size of the tariff quota is illustrated by Table 8. Rather than going through the details of results, they are explained with the aid of Fig. 1 which depicts the EU market in the CMO regime. The EU import demand is denoted $D^{UE}(p)$. It depends on the CIF import price in the EU, p . In order to simplify the presentation, the export supply function of EU territories and the export supply function of traditional

Table 7

Impact of a productivity increase in some ACP countries on CMO scenario simulation results

	Base year (average 1989–90–91)	‘Initial’ CMO scenario	‘Modified’ CMO scenario ^a
<i>Exports (in million tons) to the EU from</i>			
The dollar zone	2.429	2.553	2.553
ACP countries, including	0.586	0.468	0.629
Cameroon, Ivory Coast	0.181	0.124	0.313
Jamaica, Windward Islands	0.308	0.225	0.206
Somalia	0.042	0.056	0.051
Other ACP countries (including Belize)	0.055	0.063	0.058
Total EU imports (in million tons)	3.723	3.795	3.917
EU consumers’ welfare change (million ECU) w.r.t. the base year	–	+10.8	+115.6
CIF import price in the EU (ECU/ton)	552	554.05	527.1
FOB export price from the dollar zone (ECU/ton)	211	212.3	212.3

^a CMO scenario + productivity increase in some ACP countries (Belize, Cameroon and Ivory Coast).

Table 8

Impact of the size of the tariff quota on selected endogenous variables (CMO scenario)

Tariff quota change	Tariff quota size (million tons)	CIF import price in the EU (ECU/ton)	ACP exports to the EU (million tons)	FOB export price of dollar bananas (ECU/ton)	EU total imports (million tons)	EU consumers' welfare change w.r.t. base period level (million ECU)
–5%	2.425	571.28	498373	210.50	3722804	–54.32
–4.88%	2.429 (1)	570.79	497521	210.55	3724782	–52.51
–4%	2.451	567.74	492127	210.87	3737356	–41.03
–3%	2.476	564.35	486156	211.22	3751412	–28.29
–2%	2.503	560.72	479746	211.62	3766664	–14.54
–1%	2.527	557.51	474082	211.97	3780283	–2.36
0%	2.553	554.05	467982	212.34	3795103	+10.82
+1%	2.579	550.62	461919	212.72	3809991	+23.97
+2%	2.604	547.33	456125	213.08	3824370	+36.59
+3%	2.630	543.94	450135	213.45	3839392	+49.69
+4%	2.655	540.69	444410	213.10	3853899	+62.26
+5%	2.681	537.34	438493	214.18	3869054	+75.31
+17.5%	3.000	497.90	368878	218.68	4060464	+233.20

This level of the tariff quota corresponds to base period (1989–91) EU imports from the dollar zone and non-traditional ACP countries.

ACP countries are aggregated. The corresponding export supply function is denoted by $S_{x+y}^{UE}(p)$. Let us first assume that the tariff quota on dollar and non-traditional ACP bananas is set at level Q . In that case, equilibrium occurs at point E^* where the export supply function curve of EU territories and traditional ACP countries and the residual demand curve of the EU (i.e., $D^{UE}(p) - Q$) intersect. The equilibrium CIF import price of bananas is p^* , domestic consumption

is D^{UE*} and exports of EU territories and traditional ACP countries are S_{x+y}^{UE*} . Let us now assume that the tariff quota increases from, say, Q to \tilde{Q} . Equilibrium now occurs at point \tilde{E} where the export supply function curve of EU territories and traditional ACP countries and the new residual demand curve (i.e., $D^{UE}(p) - \tilde{Q}$) intersect. The CIF import price decreases from p^* to \tilde{p} and total imports increase from D^{UE*} to $D^{UE\tilde{E}}$. There is a decrease in imports from EU

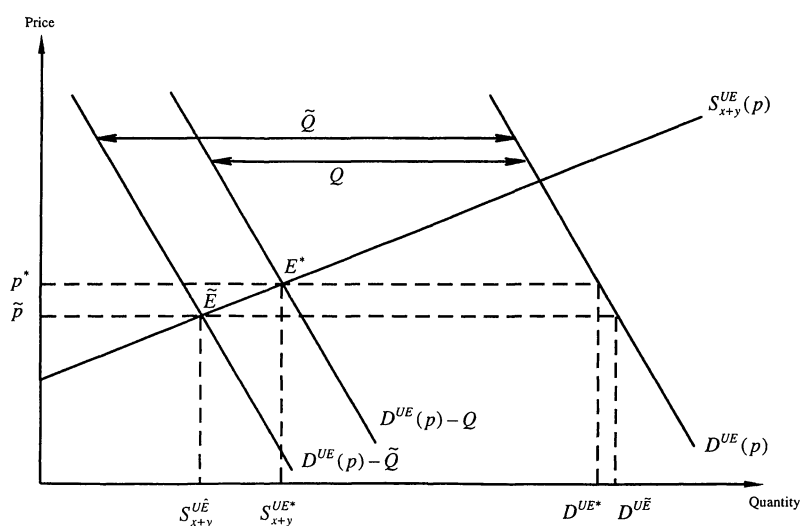


Fig. 1. Impact of the size of the tariff quota on EU market equilibrium characteristics.

territories and ACP countries since they now face a lower price. The decrease in imports from EU territories and preferred ACP suppliers is lower than the increase of the tariff quota so that total consumption in the EU increases. Of course, the opposite case which corresponds to a quota cut from initial level Q leads to an increase of imports from EU territories and preferred ACP suppliers and to a decrease of total consumption in the EU.

4. Concluding comments

Along with the realization of the Single European Market, the EU introduced a Common Market Organization for bananas which has suppressed the disparate national policies applied in the pre-CMO regime. The purpose of this paper was to analyze the principles of the new EU banana regulation and its consequences on prices, imports, exports, and consumers' and producers' welfare.

The empirical analysis uses a single-commodity, multi-country partial equilibrium model of the world banana market. Simulation results suggest that if the tariff quota set at 2.553 million tons (for the EU with 15 member states) is entirely used, consumption in the EU would increase with respect to 1989–1991 base period data. However, the impact of the CMO on EU consumers varies in each member state according to the national policy applied in the pre-CMO situation, the previously highly protected markets benefitting from a price decrease and the North of Europe (Benelux, Denmark and Ireland), Germany and the three new member states suffering from a substantial price increase. The main loser would be Germany and the main winner would be France. Consumers' welfare gains in previously highly protected markets and consumers' welfare losses in previously lightly protected countries would be nearly of the same order of magnitude. As a result, EU consumers as a whole would experience a 11 million ECU welfare gain (again with respect to 1989–1991 base period data). The impact of the CMO on the world FOB price of dollar bananas and on ROW consumers would be almost negligible.

A complementary scenario illustrates the sensitivity of empirical results to the ability of ACP countries to exhaust their ACP contingent share. According to

European Commission estimates, three ACP countries (Belize, Cameroon and Ivory Coast) would be able to fulfill their contingent share, thanks to new investments done in 1992 and other factors favoring their relative competitiveness. Simulation results show then that ACP country exports to the EU would increase compared with pre-CMO levels. In that case, EU consumers' welfare gain would increase by nearly 116 million ECU with respect to 1989–1991.

Following the WTO Appellate Body report, the European Commission has proposed to abolish the system of reserving 30% of importing licenses to traders selling EU and traditional ACP bananas and to compensate ACP producers by providing them a 10-year aid program to help them modernize their industries. Although the amount of the direct aid has not yet been determined, a sum of 45 million ECU per year is being discussed.¹⁵ This proposal can be considered as a first step in the direction recommended by many economists as it replaces the cross-subsidy of ACP suppliers through the 30% special allocation of importing licenses by a less distortionary mechanism of direct aid (Tangermann, 1998).

It was beyond the scope of this paper to provide a comprehensive analysis of the impacts of the 1998 European Commission proposal. Furthermore, the proposal may not even be sufficient to comply with the WTO ruling. This point is clearly illustrated by the declaration of US special agricultural trade negotiator, Peter Sher, who considers that the "proposal (...) continues to discriminate against US and Latin American exporters" (quoted in *Agra Europe* (London), 16 January 1998). The United States along with five Latin American banana producing countries (Ecuador, Guatemala, Honduras, Panama and Mexico) would request a 'fast-track' WTO panel to examine the legality of the EU planned reforms to its banana regime (*Agra-Europe*(London), 31 July 1998). At this stage, it is worth mentioning that the Lomé Convention expires at the end of the decade. The EU must still address the question of the most efficient way to provide trade preferences, whether by the upholding of the existing set of Lomé preferences or by the implementation of a trade and aid approach including tariff preferences (Raboy et al., 1995; McQueen,

¹⁵EU producers would be compensated through an increase in the deficiency payment they receive.

1998). However, a comprehensive analysis of the impacts of the Lomé Convention on ACP suppliers, in terms of production costs, trade flows, market shares, . . . , is missing. The banana export industry in ACP countries is at a competitive disadvantage with respect to dollar zone producers. Our results clearly show the necessity of new arrangements aimed at improving the competitiveness of ACP states since the acute dependence of many ACP countries upon the exports of bananas to the EU means that any change of the European policy is of critical importance to these economies.¹⁶

Obviously, the analysis incorporates certain simplifying assumptions and empirical results are subject to several caveats.

To our knowledge, all the models of the world banana market have assumed perfect competition, essentially due to the tractability of this hypothesis. Hallam and McCorrison (1992) and Read (1994) take issue with the Borrell and Yang (1992) estimates of the effects of different scenarios for the EU banana regime arguing that results may be biased as the Borrell and Yang model does not consider the effects of market structure and market power. Unfortunately, they do not provide an alternative model in which perfect competition assumptions would be relaxed. Incorporating imperfect competition into international trade models is a formidable challenge. Even if the importance of capturing market structure in trade policy modeling is now well recognized, all empirical work on industrial organization and trade suffers from the difficulty in modeling oligopoly in a satisfactory way (on this point, see, for example, McCorrison and Sheldon, 1993 who discuss the problem of using conjectural variations to measure oligopolistic interactions). The question arises now as to how our results may differ when perfect competition assumptions are relaxed. On this point, it is particularly important to note that 'non-competitive' behaviour of dollar importers has no

impact on the EU banana import market equilibrium under the condition that the tariff quota is constraining. Empirical evidence suggests that the tariff quota is fully used.

This paper does not address the question of the quota rent and of its allocation between exporting countries, traders and importing countries. It also does not address the problem of license transfer between operators. The tariff quota is the main policy instrument of the new EU regulation. A pertinent analysis of the quota rent problem does need a careful modeling of all the operators involved in the banana industry and of all the aspects of the market structure. Clearly, the market structure is the crucial point here which is important to represent correctly in order to obtain consistent estimates of the rent sharing. There is an important need for further research in this area.

Acknowledgements

The authors are grateful to the European Commission for support. However, the opinions expressed are those of the authors and are not intended to reflect those of the European Commission.

References

- Agra-Europe (London) Ltd., various issues.
- Borrell, B., Yang, M.C., 1990. EC Bananarama 1992. WPS 523, International Economics Department, The World Bank, Washington, DC.
- Borrell, B., Cuthberston, S., 1991. EC Banana Policy 1992, Picking the Best Option. Centre for International Economics, Canberra.
- Borrell, B., Yang, M.C., 1992. EC Bananarama 1992. The Sequel, The EC Commission Proposal. WPS 958, International Economics Department, The World Bank, Washington, DC.
- Borrell, B., 1994. EU Bananarama III. Policy Research Working Paper 1386, International Economics Department, International Trade Division, The World Bank, Washington, DC.
- Davenport, M., Page, S., 1991. Europe: 1992 and the Developing World. Overseas Development Institute, London.
- EuroPA and Associates, 1995. Commentary and Analysis on Bananarama III. Paper prepared for the CBEA, March 1995.
- FAO, 1986. The World Banana Economy 1970–1984. Economic and Social Development Paper 57.
- FAO, 1994. Perspectives à moyen terme du commerce mondial de la banane. Comité des Produits, Groupe Intergouvernemental sur la Banane, Kingston, 18–22 July (in French).

¹⁶At this stage, it is important to note that Article 2 of the Lomé Convention Banana Protocol relates to EU assistance for improving ACP competitiveness with respect to production, harvesting, handling, internal transport and trade promotion. In practice, and as far as ACP exporters are concerned, the European Commission proposal should be analyzed with respect to Article 1 of the Lomé Convention Banana Protocol which states that no ACP exporter should be treated less favorably in its traditional EU markets than in the past or at present.

- Guyomard, H., Laroche, C., Le Mouél, C., 1997. Impacts of the Common Market Organization for Bananas on European Union Markets, International Trade, and Welfare. Working Paper, INRA-ESR, Rennes.
- Hallam, D., McCorriston, S., 1992. Fair Trade in Bananas? Report 239, Agricultural Economics Unit, University of Exeter.
- Islam, N., Subramaniam, A., 1988. Agricultural exports of developing countries: estimates of income and price elasticities of demand and supply. *J. Agric. Econom.* 40, 221–231.
- Kersten, L., 1995. Impact of the EU banana market regulation on international competition, trade and welfare. *Eur. Review Agric. Econom.* 22, 321–335.
- Matthews, A., 1992. The European Community's Banana Policy after 1992. Discussion Paper 13, Institut für Agrarpolitik und Marktforschung, University of Giessen.
- McCorriston, S., Sheldon, I.M., 1993. Incorporating Industrial Organization into Agricultural Trade Modelling. Paper presented at the Conference on Agricultural Markets: Mechanisms, Failures, Regulations, Toulouse, 21–23 October.
- McQueen, M., 1998. Lomé versus free trade agreements: the dilemma facing the ACP countries. *The World Economy* 21, 421–443.
- Official Journal of the European Communities, 1994. Regulations 3224/94 and 3290/94.
- Raboy, D.G., Simpson, T.L., Xu, B., 1995. A transition proposal for Lomé convention trade preferences: the case of the EU banana regime. *The World Economy* 18, 565–581.
- Rastoin, J.L., Loeillet, D., 1995. Le marché mondial de la banane: globalisation ou fragmentation. Paper presented at the SFER conference on Globalisation des économies agricoles et alimentaires: situation et perspectives, Montpellier, 16–17 October (in French).
- Read, R., 1994. The EC internal banana market: the issues and the dilemma. *The World Economy* 17, 219–235.
- Swinbank, A., 1996. Capping the CAP? implementation of the Uruguay round agreement by the European union. *Food Policy* 21, 393–408.
- Tangermann, S., 1998. EU Banana Reform: An Improvement? Agra-Europe (London) Ltd., 6 February, A/1-A/3.
- Thagesen, R., Matthews, A., 1997. The EU's common banana regime: an initial evaluation. *J. Common Market Studies* 35, 615–627.