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Welfare Implications of the EU's Common Organization of the Market in Bananas for EU Member States

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Abstract

The objective of this paper is to analyze the welfare effects of the European Banana Market Policy. Until 1993, EU countries had a wide variety of separate national policies, ranging from free trade (e.g. Germany) to heavily regulated markets (e.g. Spain, France). On 1 July 1993, the EU's common organization of the market in bananas came into force and established a combined quota-tariff regime with preferential access for ACP and EU suppliers. We estimate the resulting changes in the welfare of consumers, traders and the national governments for all member states of the European Union to identify the winners and losers of this change in the external trade policy. Over the period 1993 to 1998, the cumulated aggregate welfare loss of the consumers amounted to ECU 1408 mill, whereas the international banana traders gained ECU 558 mill. on the EU market. The welfare effect on the national budgets of the EU member states was also positive (ECU 783 mill.) due to higher tariff income. The resulting total deadweight loss of the European Union amounted to ECU 68 mill. As regards the distribution of the welfare effects, the former free trade countries lost welfare, whereas the formerly severely regulated countries gained. In absolute terms the biggest loser of the regime shift is Germany, the biggest winner is France.

Keywords: Common Agricultural Policy, banana market, European Banana Market Policy, import demand function, trade policy
JEL-classification: F13, F14, Q11, Q17, Q18, C20

1 Introduction

With a world market share of some 23% the European Union is the world's second biggest banana importer, following the United States (30%). Thus, the banana trade policy of the EU has a great impact on the world banana market. The largest importer among the EU countries in absolute terms is Germany (1,032,470 t), per capita consumption is highest in Sweden (16.6 kg per capita). From an EU perspective, however, the import good "banana" is quantitatively only of minor importance as banana imports account for some negligible 0.2% of total extra-EU imports. [1]

Until 1993, the EU countries had separate, widely differing national banana market policies. Germany, for example imposed virtually no restrictions on the import of bananas. The Benelux-Countries, Denmark and Ireland applied a 20% customs duty on banana imports from non-preferred, i.e. other than EU and ACP suppliers, whereas the other countries (UK, France, Italy, Spain, Portugal and Greece) heavily regulated their banana markets by the application of quota schemes. On 1 July 1993 the Council Regulation on the common organization of the market in bananas came into force and replaced the mosaic of separate national banana markets by a unified banana trade policy. The regulation established a combined quota-tariff regime with preferential access for ACP and EU suppliers. This preference scheme was mainly justified by the argument that protection of ACP banana exports would serve as development aid. However, due to its discriminatory nature against third country imports (among them also developing countries from South America) it enforced the emerging trade war between the United States and Europe. In 1996, the EU banana import regime was challenged by the United States along with Ecuador, Guatemala, Honduras and Mexico. In May 1997, a WTO panel found this import regime to be illegal because it violates WTO obligations under the General Agreement on Trade in

[1] 1998-values. Source: FAOSTAT online and UN World Trade Databank. Banana Imports of EU excluding intra- EU trade (!).

Services (GATS) and the Agreement on import licensing procedures. As the modified regime implemented by the EU still perpetuated earlier WTO violations, the WTO Dispute Settlement Body (DSB) authorized US retaliatory tariffs amounting to 191.4 million on European exports a year. Despite some modifications of the regulation its discriminatory nature still has been retained for a long time. Only recently, after a costly detour of over seven years, the European Union has finally modified its banana import regime to be acceptable for the USA and also WTO compatible (see chapter 2.2). In spite of the recent changes, however, the EU's banana import regime is still far away from being a free trade regime like that in Germany before 1993.

On the other hand, considerably doubts have been raised about the efficiency of the banana regulation as development aid policy. The declared goal to support the ACP countries ("trade as aid") seems to be hardly reached by the banana policy. Borrell (1999) states that of the huge costs this regulation imposes on European consumers only a tiny share of less than 10% actually reaches its target in the ACP countries which gives rise to the suspect that other, protectionist goals are actually pursued by the banana policy. This raises the questions for the welfare effects of the new banana market regime on the EU countries and its (re)distributional implications on a national level between the differently affected groups (consumers, banana traders and the national governments) or to put it differently and more concisely: "Cui bono?" The goal of this paper is to shed some light on these questions and to identify the actual winners and losers of the regulation from a European perspective.

In the next section of the paper we describe the former regimes of the EU countries as well as the new market organization. In section three we present the theoretical model for the calculation of the welfare effects while the method for its empirical application is described in section four. In section five we present the results of the estimation. In the final section we briefly summarize the results and conclude.

2 The banana trade regimes in the EU

2.1 Import Regulation before the EU's Common Market Regulation[2]

Before 1993, as a general policy of the EU, a common external tariff of 20% ad valorem was levied on banana imports. The Lomé Convention of 1975 provided an exception to this common external tariff. This agreement showed the commitment of the EC countries to their former colonies. The Banana Protocol of the Lomé Convention allowed preferential access of ACP bananas to the EC market in the form of a zero tariff and it guaranteed Community assistance to improve ACP competitiveness. Imports from other members of the European Community were also granted duty free entrance.

However, due to a number of exceptions, the Banana market in the European Community prior to the new regime consisted of four types of countries, namely free trade countries, tariff-imposing countries, the ACP supplied countries and countries with own production.

2.1.1 Free trade countries

Austria, Finland[3], Germany, and Sweden applied no quantitative or tariff restriction on banana imports and did not intervene in the market at all. The situation in Germany is given historically. In the Treaty of Rome under a special protocol[4], Germany was granted a duty-free quota for third country imports that

[2] see Behr and Ellinger (1993, chapter 2).
[3] According to an information from the Finish Ministry of Agriculture (July 6th, 2000) Finland imposed import tariffs of some 10% on bananas but actually did not collect them in the years before the new regime went into force. Therefore we grouped Finland among the free trade countries.
[4] Protocol No. 6 annexed to the Treaty of Rome (1956).

grew according to the German demand. Almost 100% of German banana imports consisted of Dollar Bananas, which was primarily due to their competitive advantage. The origin of Dollar bananas is Central and South America, with Ecuador, Costa Rica, Columbia and Panama being the most important suppliers (Table 3).

Austria, Finland and Sweden joined the European Union on 1 January 1995. Before 1995, the banana imports were not subjected to any restrictions as in the case of Germany. In these three countries the EU banana market regulation came into force immediately after the accession. The markets in all three countries were also dominated by the so-called Dollar bananas with market shares of almost 100% (Table 3).

2.1.2 Tariff imposing countries

This group consists of five EU member countries: Belgium, the Netherlands, Luxembourg, Denmark and Ireland. These countries did not have any additional arrangements to the general EC banana trade policy as described above. This means that they applied a 20% ad valorem tariff on third country imports while EU and ACP bananas were granted duty free access. This level of protection, however, was not sufficient for the EC and ACP bananas to attain a relevant market share. Before the EC banana regulation came into force, their market share had been only of negligible size (Table 3). The only exception is the Netherlands. Most of the bananas were imported from other EU member states, especially from Belgium. But these bananas came probably originally from Central- and South America.

2.1.3 ACP supplied countries

This group consists of Italy and the United Kingdom. Both countries applied a quota and a licensing system in order to favor specific ACP countries, namely their former colonies. The ACP bananas stem from the African, Caribbean and Pacific countries associated with the EU under the Convention of Lomé.[5]

Italy:

After the abolition of the state owned banana monopoly in 1965, a quota and a licensing system as well as a banana tax were introduced. EC and ACP imports were exempted from quota restrictions although still subject to import permits. Imports from third countries were subject to quota restrictions and to the EC common external tariff. Licenses were issued twice a month if favored suppliers could not meet demand (Osorio-Peters, 1997).

The aim of the regulation was the protection of the domestic fruit industry by keeping banana prices high, the compensation of the loss of state revenues from the banana monopoly by the collection of the banana tax, as well as the guaranteed market access for Somalian bananas. Surinam, Martinique and the Ivory Coast also benefited from the regulation (Behr and Ellinger, 1993).

Nevertheless, in 1992 the bananas traditional ACP-countries had a market share of only 7.9%, although they were preferred by the foreign trade regime. Italian banana imports had is origin mainly in Central and South America (around 86%, Table 3).

[5] The new banana market regulation differentiates between traditional and non-traditional ACP countries. The traditional ACP countries comprise 12 countries (see footnotes, Table 3). Imports from these countries are more preferred relative to imports from non-traditional ACP (cf. EU, 1993). In this section we just discuss traditional ACP countries because the banana imports of the non-traditional ACPs are negligible.

United Kingdom:

The UK import system was governed by the "Banana Trade Advisory Committee" (BTAC) which consisted of producer and import organizations. This import regime favored the former British colonies of the Winward Islands, Jamaica, Belize and Surinam. Bananas from these countries enjoyed duty-free access while those from third countries were subject to a 20% tariff and quota restrictions (Behr and Ellinger, 1993).

The BTAC estimated the demand in the UK as well as the supply from sources monthly. If supply could not meet demand, licenses for Dollar bananas importation were issued. The aim of the BTAC was a restriction of supply in order to obtain a market price that allowed covering the relatively high costs of the Caribbean producers (Behr and Ellinger, 1993).

In the years before regime shift, the preference system in favor of the ACP bananas worked rather well in United Kingdom. The market share of the ACP bananas amounted to some 64.7% in 1992, whereas the market shares of the bananas produced within the EU and the Dollar bananas made up 8.6% per origin (Table 3).

2.1.4 Countries with own production

This group includes France[6], Greece, Spain and Portugal. Domestically produced bananas (in case of France the products of the Overseas Departments and ACP countries) were favored by highly restrictive market regulations that had been accepted under Article 115 of the Treaty of Rome.

[6] In the UN World Trade Databank the shipments of banana from the Overseas Departments are treated as imports until 1995. As of 1996 imports from these departments are registered as imports from France, which is actually correct, because the Overseas Departments belong to the national territory of France. For France itself, this of course means that imports from the departments drop to zero in the statistics as of 1996. To account for this change in the statistical registration, we assumed that "imports" of France from the departments were equal to their 1995-values.

Table 1: Production and foreign trade of countries with own production

Country	year	production (in t[1])	exports (in t)	Imports (in t)	Share of imports in percent of apparent consumption [2]
Greece	1992	6,738	6	42,378	86.29
	1998	5,000	22,097	79,327	116.12
Portugal	1992	40,000	0	97,167	70.84
	1998	40,000	29,959	144,188	93.49
Spain	1992	368,100	824	144	0.04
	1998	385,200	86,528	123,139	29.19

[1] t = tons
[2] apparent consumption = production + imports - exports
Source: FAO statistical database and own computation on the basis of the FAO statistical database

France:

France maintained a managed market such that two thirds of the market were reserved for imports from French Overseas Departments and one third for African French zone countries. Imports from these protected producers accounted for 99.3% of French banana imports (Table 3). In the statistics the bananas produced in the French Overseas Department are specified as EU bananas and the bananas from the African French zone as ACP bananas (Osorio-Peters, 1997).

The "Comité Interprofessionel Bananier" (CIB) managed this system. It assessed the demand monthly and then split the quantity between domestic suppliers and ACP countries in a 2 : 1 relation. In a second step, the quantity reserved for the domestic suppliers was split between Martinique and Guadeloupe in a share of 2 : 1. The ACP quota was divided between the Ivory Coast and Cameroon. If any country could not fill its quota, the other country within this quota was allowed to increase suppliers. If that quantity was still not enough, the additional quota quantity was shifted between domestic suppliers and ACP countries.

Only if this step still failed to ensure supplies high enough to meet demand, the CIB applied to a state agency for the permission of importing third country bananas. The difference between the world market price and the French market price was compensated by the state. At the beginning of the 1990s, EU bananas and the bananas from the Overseas Departments met the complete demand. Their

market share amounted to 62% and 37%, respectively. The share of Dollar bananas was insignificant (Table 3).

Spain:

Spanish legislation from 1972 said that the Spanish market is reserved for bananas from the Canary Ireland only (Osorio-Peters, 1997). Prior to the accession of Spain to the European Community (January 1st, 1986), it had been an entirely closed marked, reserved only for the Spanish banana production in the Canary Islands. According to the Accession Treaty to the EC, the regime could have been maintained till the end of the transitional period (until January 31st, 1995). However, the implementation of the Single Market in the EC obliged the enforcement of a Common Market Organization for the banana sector including the import regime for this product in the Community.[7]

The regime led to a relatively high price level. The CIF prices were considerably higher than in France or UK. This fact was due to the high production and transportation costs. The production costs were caused by unfavorable conditions for banana cultivation as well as by inefficiencies due to lack of competition. Transportation was organized by a Canary Islands export committee that had more or less monopolistic power (Behr and Ellinger, 1993).

The Spanish market had been almost closed for imports before the common regime came into force. In 1992, the share of imports in the demand was de facto zero (Table 1).

Portugal:

Until 1995, the Portuguese market had been reserved for bananas from Madeira only. Then a global quota was introduced in order to improve the quantitative supply of the market. To continue the protection of the former colony, Madeira

[7] Source: information from the "Consejero de Agricultura, Pesca y Alimentación en la Representación Permanente de España en" in Brussels, October 20th, 2000.

received a minimum quota within the global quota as well as other support. The import licenses were publicly auctioned; the state kept the rents.

The market share of imports in consumption had risen to a level of around 70% in the last years before the common banana regulation started (Table 1). Almost all banana imports had their origin in Central and South America (Table 3).

Greece:

Until 1988, Greece had banned imports of bananas to protect the domestic production in Crete and Lokania. The European Court of Justice then ruled that Greece had to relax this restriction and to allow importation. All imported bananas, however, were subjected to a high import tax, Dollar bananas additionally to EC tariff (Behr and Ellinger, 1993).

In the pre-EU-regime time (from 1988 to 1992) the share of imported bananas had grown to 86% of the domestic demand (Table 1). In the two years after the court decision most of the imported bananas came from the ACP countries. At the beginning of the 1990s the situation changed completely. As of 1992 almost all imported bananas were Dollar bananas (Table 3).

Table 2: Banana imports of all member states (in tons, Extra-EU-Imports only)

	1992	1998
Free trade countries:		
Austria[1]		92.38
Finland[1]		59.95
Germany	1378.77	1032.62
Sweden[1]		133.27
Tariff imposing countries:		
Belgium-Luxembourg[2]	144.38	154.19
Netherlands	44.10	24.25
Denmark	57.78	9.61
Ireland	54.20	51.60
ACP supplied countries:		
Italy	886.87	488.18
United Kingdom	447.81	619.83
Countries with own production:		
France	510.47	536.36
Greece	42.28	28.97
Portugal	97.19	144.93
Spain	0.22	137.53
EU-15:	3664.09	3513.67

[1] These countries became members of the European Union on January 1, 1995.

[2] In the original data the import jumped dramatically from 1995 to 1996 and the following years. This increase is implausible because the unit value increased as well (for more details see section 3.2.3). The increase is probably caused by double counting. Therefore we correct the import quantity of 1998. The original volume of the imports exclusive intra-EU-trade from the statistics is 1,010.26.

Note: share in banana imports of one year before the new banana import regime came into force and the latest available data after the regime change are listed.

Source: own calculations on the basis of data from the UNO Foreign Trade Databank.

The EU-15 imported 3,513.67 t bananas to the amount of US$ 2,534.74 mill. in 1998. The banana is just a small product in the external trade of the European Union, its share in extra-EU imports made up only 0.4% in 1998.

Table 3: Shares in banana imports measured by quantities (in percent)

		EU produced bananas [1]	EU traded bananas [2]	Traditional ACP bananas [3]	Non-traditional ACP bananas [4]	Dollar bananas [5]
Free trade countries:						
Austria	1994	0.06	0.00	0.13	0.00	99.81
	1998	1.73	0.66	0.03	0.30	97.28
Finland	1994	0.02	0.01	0.00	0.02	99.94
	1998	0.04	0.01	0.00	0.03	99.92
Germany	1992	0.05	0.01	0.01	0.16	99.77
	1998	5.74	0.05	1.16	1.51	91.55
Sweden	1994	0.03	0.25	0.00	0.04	99.69
	1998	0.00	23.97	0.00	0.00	76.03
Tariff imposing countries:						
Belgium-	1992	0.00	3.38	0.14	1.32	95.15
Luxembourg [6]	1998	22.12	4.80	4.53	12.68	55.88
Netherlands	1992	0.12	78.06	0.10	0.64	21.09
	1998	1.83	85.08	0.47	2.87	9.75
Denmark	1992	0.00	0.06	0.06	3.58	96.30
	1998	0.04	79.23	0.00	0.00	20.73
Ireland	1992	0.03	0.47	0.08	4.99	94.43
	1998	2.93	0.35	18.67	0.31	77.73
ACP supplied countries:						
Italy	1992	2.59	4.15	7.92	2.94	82.40
	1998	25.60	7.20	3.77	2.92	60.51
United Kingdom	1992	8.62	17.87	64.70	0.17	8.64
	1998	17.88	21.93	37.98	0.55	21.66
Countries with own production:						
France	1992	62.25	0.02	36.94	0.00	0.79
	1998	43.98	1.92	45.96	0.07	8.07
Greece	1992	0.00	0.08	0.89	0.00	99.03
	1998	2.44	65.91	0.00	0.00	31.65
Portugal	1992	0.00	0.03	1.96	0.00	98.01
	1998	23.64	0.77	0.36	0.38	74.85
Spain	1992	1.28	1.28	0.00	2.95	94.50
	1998	5.73	0.72	1.05	8.64	83.86
EU-15:	1992	9.84	7.53	15.59	0.97	66.08
	1998	13.13	10.0	13.48	1.18	62.19
				in absolute terms (Mt)		
	1992	389.71	298.35	617.62	38.42	2618.34
	1998	662.92	506.61	604.46	73.85	2172.43

[1] France, the overseas departments Guadeloupe, Martinique, Guyana and Reunion, Greece, Spain and Portugal.
[2] Total EU banana imports minus "EU produced bananas"
[3] Belize, Cameroon, Cape Verde, Cote d'Ivoire, Dominica, Grenada, Jamaica, Madagascar, Somalia, St Lucia, St Vincent and the Grenadine, Suriname.
[4] all other ACP-countries, which are not called traditional ACP-countries.
[5] all Caribbean and South American countries, which are not ACP-countries

[6] In the original data the import jumped dramatically from 1995 to 1996 and the following years. This increase is implausible because the unit value increased as well (for more details see section 3.2.3). The increase is probably caused by double counting. The strong increase of the imports of Dollar-bananas accounts for the jump from 1995 to 1996. Therefore we correct the import quantities from the Dollar-area of the years 1996 to 1998. The shares of 1998 are computed on the basis of the corrected data. According to the correction Belgium-Luxembourg imported 90.5 Mt. In the original data the imports make up 946.6 Mt.
Note: Normally we report the shares one year before the regime change (1992) and the latest available (1998). For the new EU members this is 1994 and 1998.
Source: own calculations on the basis of data from the UNO World Trade Databank.

In 1998, the EU member states imported 604.5 Millions tons from the traditional ACP countries, 73.9 Millions tons from the non-traditional ACP countries and 2,172.4 Millions tons from third countries (Dollar bananas) (Table 3). This figures show that actual banana imports has not exceed the quota (Table 4) established in the Common Banana Market Regulation and its subsequent modifications in the period under investigation. The EU countries imported 1999 662.9 Millions tons of bananas produced in the EU members. Further 506 Millions tons were imported from outside of the EU and traded within the EU member states. These bananas were not produced by EU countries. The import shares reveal that the regime shift does not coursed a dramatically change. The biggest part of the bananas which are consumed in the EU came still from Central and South America (so called Dollar-bananas). Only a moderate increase of the share of the EU produced bananas and a degrease of the share of the bananas coming from the traditional ACP-countries can be observed.

2.2 The EU's Common Organization of the Market in Bananas since 1993

In accordance with the implementation of the Single Market program, the European Union (EU) introduced the common organization of the market in bananas (COMB) on 1 July 1993 (i.e. a harmonized "banana import regime"; EU, 1993). The new import regime replaced the various national banana import regimes previously in place in the EC's member States. The original system of

1993 aimed at protecting the banana producers within the EU and granting special preferences to (traditional) ACP producers which otherwise would not have been competitive at world market prices. Subsequent EU legislation, regulations and administrative measures implemented, supplemented and amended that regime. Following a ruling adopted by the Dispute Settlement Body (DSB) of the World Trade Organization (WTO) in 1997, the EU modified the banana import regime slightly in 1998 (see EU, 1998), coming into force on 1 January 1999. As some of the complaining banana producers (Ecuador, Guatemala, Honduras, Mexico and the USA) still were not satisfied with the change of EU's banana import regime, the USA and Ecuador got the authorization by the WTO to impose retaliatory tariff measures (USA) and cross retaliatory measures (Ecuador), respectively in 1999. In 2000 the EU decided for the third time to reform its banana import regime, which violated GATT/WTO law right from the beginning.

The original system of 1993 aimed at protecting the banana producers (and giving them assistance) within the EU and granting special preferences to (traditional) ACP producers which otherwise would not have been competitive at world market prices. Due to the customs union and the single market status of the EU, bananas originating within the EU *("Community or EU bananas"*) can move duty-freely within the European Union.

The COMB is a tariff quota system with three kinds of quotas according to three categories of suppliers. The original regulation of 1993 underwent one major modification in 1998 (see Table 4)[8]:

a) *Quota 1:* Imports of bananas from the twelve traditional ACP countries[9] (*"Traditional ACP bananas"*) enter *duty-free* up to the maximum quantity of

[8] For a comprehensive overview of the history of the changes of EU's banana market regime and the WTO EC Banana Dispute, see Sales and Jackson (2000) and Komura (2000)..

[9] The allocation for duty-free banana imports from the twelve traditional ACP countries – as defined in the appendix of the Council Regulation 404/93 – is as following (in tons): Belize (40,000), Cameroon (155,000), Cape Verde (4.800), Côte d'Ivoire (155,000), Dominica (71,000), Grenada (14,000), Jamaica (105,000), Madagascar (5,900), Somalia (60,000), St. Lucia (127,000), St. Vincent and the Grenadines (82,000), Suriname (38,000). The Annex to the amended

857,700 tons; originally, in 1993 this quantify was fixed for each of the 12 ACP countries, since 1999 it is only defined as an aggregate quantity.

b) *Quota 2:* Imports of non-traditional ACP bananas (*"Non-traditional ACP bananas"*) and bananas from non ACP-third countries (primarily from Latin America; *„Third country or Dollar bananas"*) are subject to a tariff quota (also referred to as the "basic tariff quota" by the EC) of, originally, 2 million tons (net weight). This tariff quota was increased to 2.1 million tons in 1994 and to 2.2 million tons as of January 1, 1995.

c) *Quota 3:* In 1995 and 1996, a volume of 353,000 tons was added to the tariff quota as a result of "consumption and supply needs" resulting from the accession of three new EC member States, Austria, Finland and Sweden. Thus, the EC's tariff quota for non-traditional ACP and third-country banana imports (Quota 2 and 3) was increased to 2.553 million tons.

Banana imports within the quota of 2.553 million tons originating from third-countries were originally levied with an in-quota *tariff* of ECU 100 per ton (since 1999, ECU 75 per ton (on "Dollar bananas"; imports out of quota with Euro 737 per ton, presently)[10], those stemming from non-traditional ACP countries are duty free (in line with EC's commitments under the Fourth Lomé Convention of 1989 and the Lomé waiver granted by the GATT to permit the EC to provide preferential treatment for products originating in ACP States from December 1994 until 29 February 2000; imports out of quota are subject to a duty of ECU 693 per ton).

Of the tariff quota referred to above, 90,000 tons are reserved for duty-free entries of non-traditional ACP bananas. This volume is bound in the EC Schedule as a

Regulation 1637/98 provides only for an aggregate quantity of 857,700 tons for traditional imports from 12 ACP states.

[10] In accordance with the EC reduction commitments as a result of the Uruguay Round, the level of the bound tariff had to be reduced step by step. Since 1 July 1995 the out-of quota tariff was reduced from ECU 850 per ton to ECU 822 per ton and on 1 July 1996 to ECU 793 per ton. The final MFN (most favored nation) rate at the end of the six-year implementation period of the Uruguay Round results will be 680 ECU per ton. In accordance with the BFA the MFN in-quota tariff rate was reduced and bound from ECU 100 per ton at ECU 75 per ton from 1 July 1995 (though it was applied from 1 January 1995).

result of the "Banana Framework Agreement" (BFA)[11]. By regulation, the EC allocated this import volume largely among specific supplying countries.

d) *Hurricane licenses:* From November 1994 to May 1996, the EC – on an ad hoc basic, to operators who "include or directly represent" a producer adversely affected by a tropical storm and are thus unable to supply the EC market - issued 281,605 tons of supplemental "hurricane licenses". Hurricane import volumes enter in addition to the 2.553 million ton tariff quota and are subject to the third-country (non-ACP) in-quota tariff (ECU 75 per ton). Hurricane licenses may be used to import bananas from any source.

A further distinctive feature of the COMB is that imports from both traditional ACP and non-traditional ACP/third-country bananas are subject to *licensing procedures* which have been criticized by several countries (in particular by the USA) as being discriminatory and therefore violating GATT law. According to Commission Regulation (EEC) 1442/93, banana imports into the EC are managed on a quarterly basis. *Import licenses* for *third-country and non-traditional ACP bananas* are allocated on the basis of several cumulatively applicable procedures, including (Regulation 404/93, Article 19)[12]:

(i) allocation of licenses based on three *operator categories* (Category A: operators that have marketed third-country and/or non-traditional ACP bananas previously - get 66.5% of import licenses for imports of bananas at in-quota rates; category B: operators that have marketed EC and/or traditional ACP bananas previously – get 30% of the licenses; category C: operators who started marketing bananas other than EC and/or traditional ACP bananas as from 1992 or thereafter ("newcomer category") – get 3.5% of the licenses);

[11] In 1994, the EC negotiated the BFA with Colombia, Costa Rica, Venezuela and Nicaragua. The BFA contains provisions concerning the size of the basic tariff quota, the in-quota tariff (ECU 75 per ton), country-specific allocations and transferability of those allocations, the 90,000 ton allocation for non-traditional ACP bananas, and export certificates. The BAF was incorporated into the EC's Uruguay Round Schedule in March 1994. The BFA came into force on January 1, 1995 and is applicable until December 31, 2002.

[12] Council Regulation 1637/98 changed this strict allocation of licenses towards the management in accordance with the method based on taking account of traditional trade flows ("traditionals/newcomers"). The Commission is responsible for implementing this procedure.

(ii) allocation of licenses according to three *activity functions* (Activity (a): "primary importer" – the purchase of green third-country bananas and/or ACP bananas from the producers, or the production, and their subsequent consignment to and sale of such products in the Community – get a weighting coefficient of 57%; activity (b): "secondary importer or customs clearer" – as owners, the supply and release for free circulation of green bananas and sale with a view of their subsequent marketing in the Community – get 15%; activity (c): "ripener" - as owners, the ripening of green bananas and their marketing within the Community – get 28%);

(iii) *export certificate* requirements for import from Costa Rica, Colombia and Nicaragua;

(iv) a two-round quarterly procedure to administer license applications.

The European Communities Common Market Organization for Bananas (COMB) was criticized right from the beginning of its implementation on 1 July 1993 as being not consistent with a series of GATT regulations.

Already in 1994, a GATT Bananas panel report found that the COMB of the EC violates GATT articles I, II and III. After the WTO came into force in 1995, the Dispute Settlement Body (DSB) circulated requests for establishment of a Panel by Ecuador, Guatemala, Honduras, Mexico and the United States (WT/DS16/1). The complaining parties considered that the COMB and related measures were inconsistent with the (i) Articles I, II, III, X, XI and XIII (in particular because the COMB discriminates between Less Developed countries – traditional ACP versus non-traditional ACP countries) of the General Agreement on Tariffs and Trade 1994 ("GATT"); (ii) Articles 1 and 3 of the Agreement on Import Licensing Procedures ("Licensing Agreement"); (iii) the Agreement on Agriculture; (iv) Articles II, XVI and XVII of the General Agreement on Trade in Services ("GATS" – because of the discriminatory license regime); and (v) Article 2 of the Agreement on Trade-Related Investment Measures ("TRIMs Agreement").

The COMB was found to be illegal by the WTO in 1997. On 22 May 1997 a WTO Bananas III panel (covering regulation 404/93, the Lomé waiver, and the BFA) ruled that the EU banana import regime violates WTO obligations under the GATT, GATS and the Licensing Agreement. In September 1997 the WTO Appellate Body upheld the panel ruling. The WTO grants the EU 15 months, until 1 January 1999, to comply with the ruling.

As a response, on 1 January 1999, the EU implemented a slightly modified regime with the Council Regulation (EC) No 1637/98. The complaining parties were not satisfied with this modification and found that the deadline for EU compliance expired. The main criticisms were the setting aside of a quantity reserved solely for ACP imports, and the allocation of licenses on a "historical" basis (i.e. reflecting past sales – the Category A operators). According to the WTO this did not eliminate the "drag-on" discrimination vis-à-vis third-country operators.

As a consequence, the United States asked for WTO authorization to impose retaliatory tariffs. On 19 April 1999, the Arbitrators appointed by the WTO Dispute Settlement Body (DSB) authorized the U.S. retaliatory tariffs amounting to $191.4 million a year, the level of damage incurred by the U.S. companies calculated by arbitrators (WT/DS27/ARB of 9 April 1999)[13]. The USA carried out this trade sanctions by imposing 100% customs duties on an equivalent amount of trade. Since 3 March 1999, the USA has now been applying these prohibitive duties to a number of products (not obviously products related to bananas or other agricultural products, like motor-bikes from Austria!) from EC Member states

[13] This figure is a compromise by WTO between the calculations presented by the USA and the critique provided by the European Communities. The USA offered four types of counterfactual exercises (comparison of the actual EC import values from the USA under the present regime with the values under a WTO-consistent regime): (i) tariff-only regime at Euro 75 per ton (US$ 326.9 mill.); (ii) first-come, first-served licensing system (US$ 619.8 mill.), (iii) fully allocated tariff quota (US$ 558.6 mill.), (iv) base US counterfactual (US$ 363.4 mill.). The EC argued that there was practically no impact at all on the banana trade between USA and the EC, however there might be some loss in case of services because of the discriminatory license system. The Arbitrators of the WTO reduced their loss calculations on two scenarios: (a) the US share of wholesale trade services in bananas sold in the EU and (b) the US share of allocated banana import licenses from which quota rents accrue.

(excluding the Netherlands and Denmark). In addition, a Carousel, whereby the products subject to sanctions would be rotated every 6 months, is now likely to be applied.

On 24 March 1999 the Arbitrators of the WTO – on the Ecuadorian request for cross retaliation – found that the level of nullification and impairment suffered by Ecuador amounted to US$ 201.6 million per year (WT/DS27/ARB/ECU of 24 March 2000). This decision authorized Ecuador to retaliate against the EU under GATS and TRIPS. In fact this is the first case dealing with the new WTO enforcement mechanism of cross retaliation (see Vranes, 2001). Ecuador asked for suspension of obligations under the TRIPS Agreement in the field of Copyright and related rights on protection of EU producers of phonograms (sound recording) and broadcasting organizations as well as industrial design. Ecuador, however, did not yet apply this retaliation measures. In fact, Ecuador can suspend paying patent fees to EU companies up to the above mentioned amount. However, as a small development aid dependent country of the EU, Ecuador, did not yet apply this retaliation.

In December 2000, the Agricultural Council of the EU adopted the Commission's proposal for a new import system or bananas[14]. It was decided to implement a transitional tariff quota regime on the basis of a "first come, first served (FCFS)" system. This system was suggested by several parties, including notably the USA. The regulation should come into force on 1 April 2001 (or 1 July). This transitional system should lead to a flat tariff in 2006 at the latest (tariff-only system thereafter). Before a flat tariff can be applied, the Commission will have to conduct negotiations with the main banana suppliers under Article XXVIII of the GATT. The new system should consist of three quotas (see also Table 4):

(i) Quota A: This would maintain both the current GATT bound quota of 2.2 million tons and the tariff rate of EURO 75 per ton.

[14] See Press release by Agriculture Commissioner Franz Fischler, Brussels 20 December 2000.

(ii) Quota B: An autonomous quota of 353,000 tons, also at a tariff rate of Euro 75/ton.
(iii) Quota C: A new third autonomous quota of 850,000 tons at a tariff rate of Euro 300/ton.

All three quotas would be open to all suppliers and managed on a "first come, first served" basis" (FCFS license system) instead of an auctioning system. ACP bananas would have a tariff preference of Euro 300 per ton both under and outside of the tariff quotas (effectively they would enter at zero in quotas "A" and "B". They would also enter at zero in quota "C" provided that the tariff within the quota did not exceed Euro 300 per ton.
Just recently, on 11 April 2001 a consensus between the US government and the Commission of the European Communities has been reached.[15] As of 2006 the European Banana Market shall be subject to a tariff only system with preferential access for ACP countries. The transitional regime, which will come into force on 1 July 2001, widely corresponds to the proposal mentioned above with the following slight modifications:
Instead of using the "first come, first served" system, the licenses shall be allocated according to historical reference values (based on the period 1994 to 1996). The US government has agreed to suspend theirs sanctions after implementation of these regulations as of 1 July 2001. In a next step (planned for the end of 2001) 100,000 tons shall be transferred from quota C to quota B. The quota C will be reserved exclusively for bananas from the ACP countries. After implementation of this second step the US sanctions shall be abolished completely. Both modifications are concessions of the EU to the USA, because more dollar bananas can enter over quota B (at a lower tariff than in quota C) and the regime, based on historical reference values grants more protection for the traditional US exporters.

[15] The regime quoted here has been adopted by the European Commission on 2 May 2001, but has not been published in the official journal yet (http://europa.eu.int/comm/trade/miti/dispute/bana.htm).

After a costly detour of over seven years the European Union has finally modified its banana import regime to be acceptable for the USA and also WTO compatible, if a "waiver" for the ACP preference regulations is granted by the WTO. In spite of the recent changes, the EU's banana import regime is still far away from being a free trade regime like that in Germany before 1993.

In our study, we analyze primarily the welfare impact of the change in the banana import regime for individual EU member states and for the EU as a whole. Our counterfactual exercise is the comparison of the welfare situation of the EU countries under the COMB with the welfare situation under the extrapolated previously existing country-specific banana market regimes. An alternative counterfactual exercise would be to compare the actual situation with a complete free trade regime, as done by Borrel (1999).

As our data basis covers the period 1993 to 1998, we cannot explicitly capture the change of the regime of 1998, coming into force in 1999. However, as there were only minor changes in quotas and tariffs we make an extrapolation for the years 1999 and 2000, based on our estimated average annual welfare effects. In order to fully evaluate the COMB, one should not only consider the consumer-side (importers) of bananas (the EU countries) but also the supply-side (producers). As the traditional ACP countries are preferred by the EU system potential welfare looses must be existent in the third-country suppliers (primarily in Latin America and in the USA). The calculation of the welfare effects on the exporting countries is beyond the scope of this paper. We will just have a look at some illustrative statistics at the end of this study (see 4.6).

Table 4: The EU Import Regime for Bananas since 1 July 1993 and modifications

Category of banana imports	**Access volume (Quotas)**	**Source/ definition**	**Tariffs applied**	**Modifications of the EC tariff quota regime under Regulations 1637/98 and 2362/98**
Traditional ACP bananas	857,700 tons (*Quota 1*)	Imports from 12 traditional ACP countries	Duty-free	- elimination of country- specific allocations (of Reg. 403/93)
Non-traditional ACP bananas	2,553,000 tons[1] (*Quota 2:* 2,200,000 tons; *Quota 3:* 353,000 tons)	Imports of traditional ACP quantities above the 857,700 tons or quantities supplied by non-traditional ACP countries.	Duty-free up to 90,000 tons. ECU 750 per ton for additional imports out-of-quota.	- elimination of country- specific allocations and "other" category totaling 90,000 tons (of Reg. 478/95). - increase in duty-free access opportunities from 90,000 tons to 240,748 tons under the "other" category of the 2.553 million tons tariff quota. - increase of preference for out-of-quota imports from 100 to Euro 200 per t.
Third-country bananas ("Dollar bananas")		Imports from any non-ACP source	ECU 100 per ton up to 2.553 million tons. Under BFA allocation of tariff quota to 4 countries plus others. ECU 850 per ton for additional imports out-of-quota (as of 1 January 1999 Euro 737 per ton).	- Euro 75 per t up to 2.553 million tons (Euro 737 per ton for out-of-quota imports). - modified country-specific allocations to 4 Members and an "others" category. - transferability of unfilled portions of country - specific allocations eliminated. increase in access opportunities by 90,000 tons to 2.553 mill. tons because of the elimination of country-specific allocations to non-traditional ACP suppliers.

[1]In the Council Regulation (EEC) 404/93 the import quota amounted 2 million tons. This tariff-quota was increased to 2.1 mill. tons in 1994 and to 2.2 mill. tons on January 1995 (*Quota 2*). In 1995 and 1996, a volume of 353,000 tons was added due to the accession of three new Member States (Austria, Finland and Sweden; *Quota 3*).

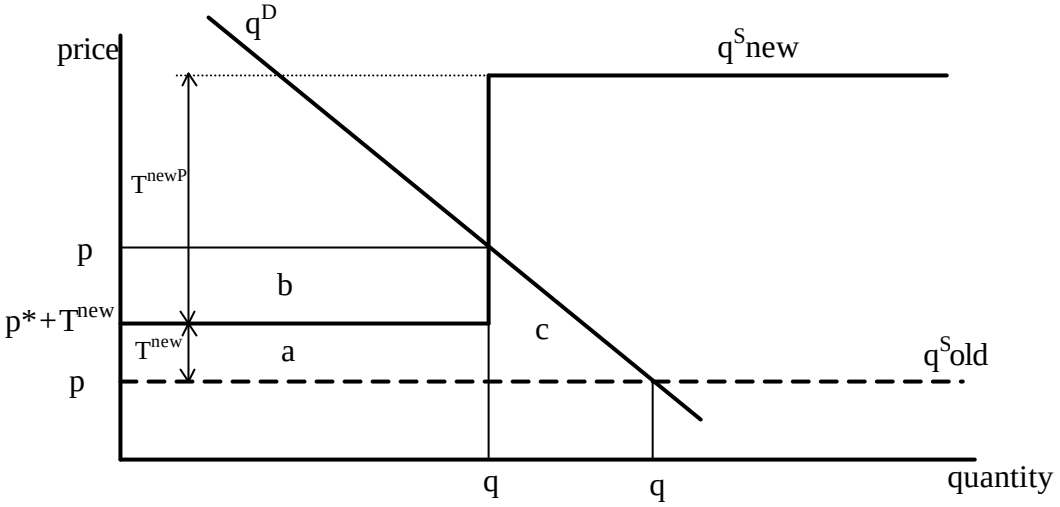
Sources: Council Regulations (EEC) No 404/93 of 13 February 1993 on the common organization of the market in bananas, Official Journal L 047, 25/02/1993, p. 0001-001. Council Regulation (EC) No 1637/98 of 20 July 1998 amending Regulation (EEC) No 404/93 on the common organization of the market in bananas, Official Journal L 210, 28/07/1998, p. 0028-0031. Commission Regulation (EC) No 478/95 of 1 March 1995 on additional rules for the application of Council Regulation (EEC) No 404/93 as regards the tariff quota arrangements for imports of bananas into the Community and amending Regulation (EEC) No 1442/93, Official Journal L 049, 04/03/1995, p. 0013-0017. Commission Regulation (EC) No 2362/98 of 28 October 1998 laying down detailed rules for the implementation of Council Regulation (EEC) No 404/93 regarding imports of bananas into the Community, Official Journal L 293, 31/10/1998, p. 0032-0045.

3 Welfare Effects of the EU Banana Market Regime

3.1 The theoretical model

Our study is the first analysis of the welfare effects of the new banana market regime for each of the 15 EU member countries. The welfare consequences are analysed for three differently affected groups: consumers, international banana traders and the government. Basically we follow the stylised model set out by Herrmann (1999). His analysis, however, refers only to Germany, which had a free trade regime before the introduction of the EU common banana market regime. Furthermore ACP and EU suppliers of bananas had (and still have) only negligible shares in the German banana market. Therefore a number of modifications are necessary to cope with the additional complexities arising form the extension of the analysis to all EU countries. We will first describe the basic methodology, which refers to the free trade case of a country that only imports dollar bananas. Building up on this special case we will then describe the modifications used for the countries with other (prior) trade regimes and non-negligible shares of EU and ACP suppliers. The essence of the welfare analysis can be best illustrated graphically.

Figure 1: Welfare effects of the new banana market regime



Source: Hermann (1999, p. 70).

q^D .... quantity demanded under the new regime (= common European banana market regime)
p ..... price under the new regime
q* ... quantity demanded under the hypothetical regime (= old regime before introduction of common European banana market regime)
p* ... price under the old regime
T ..... tariff of the new regime[16]

Assuming a situation with free trade and totally price elastic exports (small country assumption) the export supply curve for the country in question is given by the horizontal line (q^Sold) that is intersected by the demand curve (q^D) at the world price level p*. Of course, from the perspective of the country in question these exports of the banana suppliers have to be regarded as imports, which in turn equal banana consumption[17] (and in equilibrium also demand) as the country has no own banana production. Suppose now that the new banana market regime as described above is introduced. An import tariff T^{new} is imposed on import quantities up to an amount of q. On quantities in excess of this quota q a prohibitive tariff ($T^{new} + T^{newp}$) is imposed. This results in a double-kinked supply curve (q^snew) with a vertical part at q. The new equilibrium is given at the intersection of the demand curve (which is assumed as stable) and the new supply curve, resulting in a new price p and a new quantity q. As one can see the price increase from p* to p is not only due to the tariff imposed but also to the "artificial scarcity" of the banana supply as a result of the quota that enables the banana traders to sell their goods at a higher price than under a pure tariff regime. As regards the welfare effects resulting from this regime shift three differently affected groups have to be distinguished.

[16] As a (small) t is regularly associated with ad valorem tariffs (in %) we use the capital T^{new} (T^{newP}) to denote the new tariff which is expressed in Euro/quantity.
[17] Strictly speaking, the assumption that imports equal consumption is only valid if there are no own production and no exports. Basically, we neglect re-exports in our analysis, i.e. we analyse the welfare effects at the highest level of economy, where (original) exporters and importers met. Thus, we also do not attempt to pursue the welfare effects along the various marketing channels (wholesalers, retailers, etc.). For countries with a relevant size of own production, however, a

Consumers obviously incur a welfare loss (forgone consumer surplus) as a result of the price increase. It corresponds to the area (*a* + *b* + *c*) in Figure 1 and can be formally expressed as

$$? W_C = \int_{p}^{p^*} q^D(p)dp \qquad (1)$$

with ΔW_C ... Welfare effect on consumers, $q^D(p)$ ... banana demand function p ... actual price after the regime shift, p* ... hypothetical price without regime shift

The international banana traders gain as the quota system makes bananas even more scarce than under a pure tariff regime. The welfare effect on the banana traders (quota rent: ΔW_T) is given by the area (*b*) in Figure 1. Formally we have

$$? W_T = [p - (p^* + T^{new})]\, q \qquad (2)$$

In the case of auctionings of licences the governments (EU Commission) would collect this rent. Finally, we have to consider the effect on the *budget of the country's government (a)*. Compared with the situation under free trade the additional tax revenues amount to

$$? W_G = T^{new} q \qquad (3)$$

Thus the *resulting aggregate welfare effect* (ΔW) is a typical deadweight loss (area c in Figure 1) and amounts to the sum of these three components:

$$\Delta W = \Delta W_C + \Delta W_T + \Delta W_G.^{18} \qquad (4)$$

specific procedure is adopted, which takes re-exports into account and also considers the welfare effects on the producers (see section 3.2.2).

[18] Herrmann (1999) also distinguishes a European from a national view in his welfare analysis. The differences result from the fact that – as a result of the allocation of the import licences – the national banana markets are not completely covered by the according national banana traders so that part of the quota rents also accrue for foreign banana traders. Furthermore Herrmann argues that the budgetary gain does not necessarily reduce the country's financial contributions to the EU by the full amount of the additional tax revenues. As we have no exact information on market

Weather additional tariff revenues resulting from the new regime are actually welfare gains for the individual EU member states is an open question. In general tariff revenues of the EU member states are part of the EC's own budget resources and therefore transferred directly to the EU budget. However, the total gross contribution of each EU country is limited to a maximum of 1.27% of GDP. If tariff revenues increase, the residual position, namely the transfers from GNP resources can be decreased accordingly. Thus we regard additional tariff revenues as a result of the EC's new banana import regime as welfare gains of the individual EU member states.

3.2 Empirical Implementation

So far the analysis shows that the key ingredients for calculating the welfare effects are p, q p*, q* and T^{new}[19]. p and q are given by the actual development after the regime shift, T^{new} is the tariff imposed by the new regime, p* and q* are the hypothetical quantity and price under the hypothetical situation without regime shift. As in any ex-post analysis the problem is to determine the hypothetical situation, that would have occurred if no regime shift had taken place. In our case this corresponds to the estimation of the two variables p* and q*.

The heterogeneity of the countries' prior banana trade regimes de facto precludes the application of a standard procedure for all countries to calculate the welfare

shares of the banana traders and the distribution of the import licences on a national level we assume that the whole quota rents accrue to banana traders of the country in question. Furthermore as additional tariff revenues reduce the country's contribution from its other own resources we assume that the whole additional tariff revenues can be regarded as budgetary welfare gain of the government.

[19] Throughout the analysis we assume that imports of Dollar and non-traditional ACP bananas do not exceed the quota of 2.553 million tons under the new regime, so that the prohibitive tariff does not apply and the actual tariff used in the calculation amounts to €100/metric ton (since 1999, Euro 75/ton).

effects. For this reason the use of a CGE-model is nearly impossible. We therefore quantify the welfare effects with a partial-analytic approach.

3.2.1 The general procedure for the free traders

For the free trade countries (Austria, Finland, Germany, Sweden) the following standard procedure was applied:[20]

First Step: Estimation of the banana import demand function q^D

We do not intend to construct sophisticated banana import demand functions that would have to include not only the banana price, but also a measure of purchasing power and the price of a substitute. Rather we try to achieve a good fit by using a log-linear demand function that uses the price as basic explanatory variable while we attempt to capture the remaining influences by a linear trend or an AR-term. In two cases (Greece, Spain) problems in the estimation forced us to use a calibration approach. The estimated (calibrated) banana import demand functions of the EU-countries are summarised in the Appendix.

Second Step: Forecast of the hypothetical price p that would have materialised if no regime shift had taken place*

This is the most sensitive part of our analysis. The large heterogeneity between the regimes of the different countries complicates a uniform modelling approach so that – as an approximation – we forecast the price under the old regime based on "plausibility considerations" mainly by using a linear trend technique. In many of the cases the situation is "quite clear": that means one can see a clear effect due to the regime shift, e.g. constant or slightly decreasing prices up to 1992 and a sharp price increase after the introduction of the new regime as in the case of Germany (see Appendix). However, one has to bear in mind that this ad hoc

[20] The whole procedure is outlined for the case of Germany in Appendix 1.

technique can only be regarded as approximation, especially in cases where the situation is not that clear. In the appendix the estimated trend equations and the forecasted prices are summarised.

*Third Step: Forecast hypothetical quantity q**

The hypothetical quantity q* that would have materialised if no regime shift had taken place is then simulated using the estimated import demand function (step one) and the forecasted price q* (step two).

Fourth Step: Adjustment of p for exchange rate effects and calculating the according quantity

The data we use are provided in US-$. For estimating the demand function and the welfare analysis, of course, we have to use the prices in national currencies. As the exchange rates of some countries changed considerably in the period under investigation the actual price has to be adjusted for exchange rate effects. This is achieved by using the average exchange rate of the three years before the regime shift (1990-1992) resulting in a new "actual" price $\hat{p}$ and an according new "actual" quantity $\hat{q}$ which is simulated using the estimated demand function. As the hypothetical price p* is forecasted by the trend of the last years prior to the regime, this implies the use of approximately the same average exchange rate.

Fifth Step: Calculation of welfare effects

Having determined the values of p*, q* and $\hat{q}$, $\hat{p}$ we can calculate the welfare effects ΔW_C, ΔW_T, ΔW_G and the deadweight loss ΔW by using the equations (1), (2), (3) and (4).[21] As we are using (a) a log-linear form for the demand function with a trend in most cases[22] ($\ln(q) = a + b\ln(p) + c\,\text{trend}$) the solution to the integral in (1) is

[21] Of course, instead of the actual values p and q one has to use the adjusted values $\hat{p}$ and $\hat{q}$.

[22] In the case of demand functions with an AR-term we used the structural form (function without AR terms) to forecast the hypothetical quantity, so that formula (5) can also be applied in these cases (with the slight modification that the trend term is zero, i.e. c=0 in equation 5).

$$? W_C = \int_{\hat{p}}^{p^*} q^D(p)dp = \int_{\hat{p}}^{p^*} e^{a+b\ln(p)+ctrend}dp = \frac{pe^{a+b\ln(p)+ctrend}}{1+b}\Bigg|_{\hat{p}}^{p^*} \quad (5)$$

Only for the calculation of the effects on consumer welfare of Greece and Spain we used the linear approximation (see 3.2.2).

3.2.2 Specific procedure for the non-free traders

The welfare analysis and the estimation procedure described above can only be applied directly to the free trade countries, whereas for the other groups some modifications are necessary.

Accounting for the different banana market regimes before the introduction of the EC Common Banana Market Organisation in the European Countries

Free trade countries: Austria, Finland, Germany, and Sweden. As already mentioned for these countries the method described above can be applied directly.

Tariff imposing countries: Belgium, Netherlands, Luxembourg, Denmark, and Ireland applied a 20% tariff on third country imports. This effects the calculation of the welfare effects as follows: The price p* which is forecasted using a trend technique now also includes the old tariff T^{old}, i.e. $p^* = p^{**}(1 + t^{old})$ where p** is the hypothetical price without tariff.[23] Nevertheless equation (1), which gives the change in consumer welfare, can be applied without any modification, as the old tariff would also have to be paid by the consumers. However, when calculating the price effect that is due to the new tariff (and the effect that is due to the quota rents of the traders) the old tariff T^{old} has to be deducted from the forecasted price

[23] The small t denotes that the old tariff is expressed in percent of the price.

p* before adding the new tariff T^{new}. Therefore, if we calculate the welfare effects on the traders, equation (2) has to be modified as follows:

$$? W_T = [p - (p^{**} + T^{new})]\, q = [p - (p^* /(1 + t^{old}) + T^{new})]\, q \qquad (2a)$$

Finally, there is also a difference in calculating the welfare effect on the budget of the EC member states, as there are opportunity costs of the new regime in form of foregone tariff income that would have been earned if no regime shift had taken place. Therefore the hypothetical tariff income under the old regime has to be compared with the income resulting from the new regime to calculate the net effect of the regime shift on the welfare of the government. Instead of equation (3) we therefore have to use:

$$\Delta W_G = T^{new} q - t^{old} p^{**} q^* \qquad (3a)$$

ACP supplied countries: For Italy and the UK the calculation of the welfare effects is quite similar to the tariff imposing countries, if we assume a tariff equivalent to their particular regime (in %) and use this equivalent instead of t^{old} in formula (2a). For the consumers, equation (1) can again be applied directly as in the case of the tariff imposing countries. However, the calculated tariff equivalent cannot be regarded as (foregone) income of the government. For this reason the welfare effect on the government can be calculated by directly applying equation (3). The sensitive point in this analysis is the determination of the tariff equivalent. As crude approximation we chose a tariff equivalent of 20% for both France and Italy. Due to the heavily regulated regimes this value should be interpreted as a lower bound.

Countries with own production: as regards the countries with an own production (Greece, Portugal and Spain), a different approach has to be used in evaluating the welfare effects. Specifically a new group (the domestic producers) has to be

accounted for. For our analysis this means that in order to be able to calculate the welfare effect on the producers, we have to forecast a hypothetical producer price and a hypothetical production quantity.

In the case of Portugal, problems regarding the quality and availability of banana production data forced us to concentrate our analysis on the banana imports. The results of the analysis still have a considerable relevance as imports made up some 75% of the domestic consumption (in the years 1989-1997). Exports were rather low and disregarded in the analysis. Therefore the method used for the analysis of the tariff imposing countries can also be applied to Portugal, whereby we assumed a tariff equivalent of the old regime amounting to 20%. Again this value should be regarded as a very low estimate.

In the case of Spain and Greece we consider three groups: the producers, the consumers and the state. In turn we neglect the effect on the international banana traders because of the large uncertainty in the data, problems in the choice of the appropriate tariff equivalent and the location of the affected banana traders. In both cases problems in the estimation (negative estimation results such as insignificant coefficients and wrong sign) forced us to calibrate the supply and demand function where we assumed a price elasticity of both import demand and domestic production (supply) of one. A calibration technique had to be used to get "reasonable" production supply (q_{prod}) and import demand ($q_{imp)}$ functions:

$$q_{prod} = f(p_{prod}) \tag{6}$$

and an import demand function

$$q_{imp} = f(p_{imp}) \tag{7}$$

Exports (q_X) are assumed as exogenous so that domestic demand (apparent consumption) (q_C) is given by

$$q_C = q_{prod} + q_{imp} - q_X \tag{8}$$

Using the same method as in our standard analysis, we then forecast a hypothetical price for both domestically produced bananas (p_{prod}*) and imports (p_{imp}*). The price of the consumers is proxied by a weighted average of p_{prod}* and p_{imp}*. The weights used correspond to the share of q_{imp} and ($q_{prod} - q_{X)}$ in consumption q_C. Having forecasted p_{prod}* and p_{imp}* and simulated the according quantities q_{prod}* and q_{imp}* we can also calculate p_C* and q_C*. We then proceed by calculating the welfare effects using the following formulas:

Consumers: the welfare effect on consumers is again given by

$$\Delta W_C = \int_{p_C}^{p_C^*} q_C(p)dp \tag{9}$$

As we do not have an explicit demand function for q_C but derive its value from the imports (q_{imp}), domestic production (q_{prod}) and exports (q_X) as $q_C = q_{imp} + q_{prod} - q_X$ we use the linear approximation to calculate the welfare effects on the consumers:

$$\Delta W_C = q\Delta p + \Delta q\Delta p/2 = q(\hat{p} - p^*) + (\hat{p} - p^*)(\hat{q} - q^*) \tag{10}$$

Producers: the welfare effects on the producers (ΔW_P) are calculated using the well known formula

$$\Delta W_P = \int_{p_{prod}^*}^{p_{prod}} q_{prod}(p_{prod})dp_{prod} \tag{11}$$

Budget: the effect on the budget is given by the increase in the tariff revenues

$$\Delta W_G = T^{new} q_{imp} - t^{old} p_{imp} * q_{imp}^* \tag{12}$$

Actually, the second terms can be disregarded in both cases because neither Greece nor Spain imposed a tariff on bananas under the old regime.

Accounting for the Heterogeneous Import Structures

Some of the EU countries' imports were (de facto) only comprised of dollar bananas. Germany, Austria are such cases were the share of ACP and EU bananas only accounted for a negligible share of the banana import market. For these countries we assumed a share of dollar bananas of 100%. However, other countries (Netherlands, Italy, France, United Kingdom) have rather heterogeneous banana import structures with substantial market shares of ACP and EU bananas. Theoretically the bananas from the different origins cannot be regarded as homogenous goods. However, it was not possible to identify separate banana demand functions for the different banana types. Moreover price changes as a result of the regime shift led to a considerable shift in consumption from the dollar bananas (whose price increased) to the bananas favoured by the regime (whose prices remained at the old level) in some countries (especially in Denmark, Sweden). Thus one may conclude that although the different bananas are heterogeneous goods, their markets are not perfectly segmented. As we were not able to separate demand for the different banana types we simplified the analysis by using only aggregate data (total quantity, total value, average price). This actually implies assuming a homogenous import structure, comprised of a synthetic banana, which is composed of the different banana types according to their imports shares. Accordingly, we used a weighted tariff, as the different banana types are treated differently both under (part) of the old regimes and under the new regime. Although the actual regime is actually more complex, we use only two categories in the calculation of the weighted tariff: duty-free bananas (traditional ACP-bananas and EU-bananas) and bananas on which a tariff amounting to 100ECU/t was imposed (dollar bananas and non-traditional ACP-bananas).[24]

[24] Actually, non-traditional ACP bananas and dollar bananas are treated differently under the new regime (compare section 2). However, the shares of non-traditional ACP bananas are only of minor importance. Therefore this simplification has only negligible consequences for our analysis.

We are well aware that there are a number of caveats in this highly simplified approach. Additionally, there is a considerable amount of uncertainty regarding the quality of the data which further aggravates the empirical analysis. Our approach should therefore be regarded as a first approximation rather than a final step in assessing the effects of the new banana market regime. However, in many of the countries to which we applied this analysis the development of the import prices and quantities can be plausibly traced back to the new regime so that the direction and the dimension of the calculated welfare changes can be regarded as good approximations.

3.2.3 Data

Our first approach was to use data from Eurostat[25]. However, this data source suffers from a "Antwerp-effect" – i.e. imports shipped over the harbor of Antwerp are registered as Belgian imports – which makes it impossible to identify the actual origin of the banana imports. Furthermore, the time series for the new member states of the European Union (Austria, Finland and Sweden) are only available as of 1995. Therefore we shifted to the UN World Trade Databank[26] which turned out to be the best source available. It provides data on banana imports classified by origin, which enabled us to calculate the according import-quantities/values of Dollar, EU, traditional ACP and non-traditional ACP bananas. Our time series start with 1979, the latest year covered is 1998. In the cases of Spain and Greece additionally data on domestic banana production were needed. These producer data were from the FAO database, as were the trade data for these countries.[27]

[25] Source: COMEXT-database (homepage of the Austrian Institute for Economic Research).
[26] All data were taken from the homepage of the Austrian Institute for Economic Research.
[27] There are, however, a number of problems with producer data of Spain and Greece. The data on producer prices for example are incomplete (1996/1997 are missing) and the data for the production quantities seem to be set to its 1995-value as of 1996.

As regards the UN World Trade Databank a further complication has to be taken into account. In 1996 there has been a change in the registration of imports from the French Overseas Departments (Guadeloupe, Martinique, Reunion, French Guyana). Despite the fact that these Departments belong to the national Territory of France, imports from them were collected and given separately for each of the Departments in the statistics until 1995. This is even true for the case of France, whose "imports" from its own former colonies could therefore be seen in the statistics. Since 1996, however, imports from these departments are registered as imports from France. For France itself, this of course means that imports from the departments drop to zero in the statistics as of 1996. To account for this change in the statistical registration, we assumed that "imports" of France from its departments were equal to the 1995-value. For the data of the other countries this had no implications for our analysis, since we only used banana imports from the EU as an aggregate. As both France and its Overseas Departments are EU bananas, the redefinition as stated above has of course no impact on the aggregate level of imports of EU bananas.

The case of Belgium-Luxembourg poses a special problem, as imports exploded as of 1996/1997, independent of the data source used (UN World Trade data bank, FAO data, data provided by national sources[28]). This implausible increase was furthermore accompanied by a simultaneous price increase, which makes the data even more questionable. As exports also increased very sharply, a first approach was to use net imports. The calculation of net imports, however, resulted in partly negative values. To side-step this problem we finally used data from the FAO Food Balance Sheet (FAO (1999), Item: Domestic Supply), which behaved reasonably until 1995; as price we took the unit values of the imports (also from the FAO), which showed no obviously implausible behavior. This unit values were then also used to forecast the quantities for the years 1996 to 1998. Nevertheless, the calculation of Belgium should only be regarded as a rough approximation.

A further point regarding the data used has to be made here: the definition of the bananas in the UNO and FAO databases do not exactly coincide with the definition in the regulation. In the current banana regime only imports of fresh bananas (excluding plantains, fresh or dried; frozen bananas; bananas provisionally preserved; powder and flakes of bananas; bananas preserved in sugar homogenized preparations of bananas; Jams, jellies, marmalades, purées and pastes of bananas; bananas otherwise prepared or preserved; mixtures of bananas otherwise prepared or preserved; banana juice) are covered. Our data source provides only data on fresh incl. dried bananas (SITC-Rev.3: 0573) The dried bananas, however, are quantitatively only of negligible importance, so that this problem does not invalidate our estimates.

Finally, the US Dollar unit values of the bananas were converted into national currencies using the according year's average exchange rate (Source: International Financial Statistics, line "country code"__RF"). The exchange rates between the national currencies and the ECU, used to convert the welfare effects into a common currency, were taken from the Commission of the European Communities. The welfare effects are also expressed in percentage of the countries' (and the EU's) GDPs, which were taken form the International Financial Statistics (line "country code" 122"99B").

No one is more aware of the problems of the awkward data situation than us. Nevertheless, we think that the problematic data situation should not be used as an argument for abandoning the attempt to analyze the welfare effects of the banana market regime also empirically. However, when interpreting the results, which may appear in rather clear-cut numbers, one always has to remember the problematic basis, form which these results have been derived.

[28] Information of the Center of Agricultural Economics, Brussels on a request.

4 Empirical results

The impacts of the new EU banana market regime on the welfare of all member states of the European Union are quantified for the years 1993[29] to 1998. For every country the policy-induced changes of import prices, quantities and expenditures are investigated and the welfare effects on consumers, traders and the governments as well as aggregate welfare change are computed. For all countries prices, quantities and expenditures are compared with the hypothetical situation under their respective old regimes. This means that we have not investigated the additional distortions caused by the deviation of the old regime from free trade, which would be the best regime from the welfare point of view. Following the classification introduced in section 2, we split the European market into four groups, namely the free trade countries, the tariff imposing countries, ACP supplied countries, and the countries with domestic banana production.

4.1 Free trade countries

The group of free trade countries consists of Austria, Finland, Germany, and Sweden. As expected, in all four countries the import prices resulting from the new regime were higher and the import quantities lower than they would have been under the old individual regimes. For Austria, Finland and Sweden the impacts were computed just for the years 1995 to 1998 because these countries adopted the regulation with their accession to the European Union on 1 January 1995.

All countries of this group were net losers of the new banana regime in all years. The import price and the import expenditure increased considerable and the

[29] The year 1993 has to be treaded with caution, because the banana market regime came into force only on 1 July 1993. Thus, the data in 1993 reflect both the old and the new import regime; the calculated welfare effects therefore cannot be interpreted as "pure" effects of the new regime.

import quantity decreased. Consequently, consumer surplus decreased. This loss was not compensated by the gain of the traders and the government.

Among the former free trade countries Finland was the country affected most severely by the new banana regime. The new regulation raised the import price by 15.4% (1995) and 60.4% (1997) compared to the hypothetical situation without regime shift. The import quantity decreased accordingly by 10.7%, respectively 31.2%. The policy-induced expenditure increase lay between 3.1% and 10.4%. Like in all countries of this group the consumers lost substantially and the traders and the government gained. Finland suffers an aggregate welfare loss of ECU 11.8 mill. over the investigation period (1993-1998).

In absolute terms Germany suffered the largest loss. The total aggregate loss made up cumulated over 1993 to 1998 ECU 236.3 mill; consumer surplus decreased by ECU 979.9 mill. over the five years. The reason for this is that – in absolute terms – Germany is the biggest banana importer in the European Union and that its former regime was the most liberal.

Austria suffered the smallest loss both in absolute as well as in relative terms. The welfare was reduced by only ECU 13.3 mill. over the whole period. In relative terms the welfare loss varied between 0.00063 (1993) and 0.0026% of GDP (1997). Import prices, quantities and expenditures were affected less than in the other countries of this group.

Table 5: Economic impact on the **free trade countries**

		1993	1994	1995	1996	1997	1998	1993 - 1998
A	Policy-induced:							
	Price change [in %]			18.76	38.14	37.58	45.45	
	Quantity change [in %]			-17.50	-30.34	-30.02	-34.24	
	Expenditure change [in %]			-2.02	-3.77	-3.72	-4.35	
	Welfare effect on:							
	(1) Consumers [mn. ECU]			-11.96	-22.82	-22.44	-26.85	-84.07
	(2) Traders [mn. ECU]			-0.40	9.13	8.54	11.98	29.25
	(3) The Austrian budget [mn. ECU]			11.27	10.00	10.31	9.92	41.5
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]			**-1.10**	**-3.69**	**-3.59**	**-4.95**	**-13.33**
	Relative to GDP [in % of GDP]			**-0.0006**	**-0.0021**	**-0.0020**	**-0.0026**	**-0.0073**
FIN	Policy-induced:							
	Price change [in %]			15.42	58.18	60.43	60.32	
	Quantity change [in %]			-10.72	-30.41	-31.18	-31.14	
	Expenditure change [in %]			3.05	10.08	10.41	10.39	
	Welfare effect on:							
	(1) Consumers [mn. ECU]			-6.49	-22.01	-23.86	-24.82	-77.18
	(2) Traders [mn. ECU]			-1.44	12.38	13.43	13.84	38.21
	(3) The Finish budget [mn. ECU]			7.58	6.14	6.55	6.94	27.21
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]			**-0.35**	**-3.50**	**-3.89**	**-4.04**	**-11.78**
	Relative to GDP [in % of GDP]			**-0.0004**	**-0.0035**	**-0.0036**	**-0.0035**	**-0.0110**
D	Policy-induced:							
	Price change [in %]	-13.20	17.72	45.81	40.62	29.15	39.16	
	Quantity change [in %]	16.52	-16.16	-33.46	-30.81	-24.14	-30.02	
	Expenditure change [in %]	1.14	-1.30	-2.98	-2.70	-2.03	-2.62	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	86.00	-104.58	-261.43	-246.55	-191.72	-261.59	-979.87
	(2) Traders [mn. ECU]	-227.32	-11.94	114.32	99.79	37.41	95.19	107.45
	(3) The German budget [mn. ECU]	67.21	107.80	100.19	106.29	130.02	124.62	636.13
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**-74.12**	**-8.72**	**-46.92**	**-40.48**	**-24.29**	**-41.77**	**-236.3**
	Relative to GDP [in % of GDP]	**-0.0046**	**-0.0005**	**-0.0025**	**-0.0022**	**-0.0013**	**-0.0022**	**-0.0133**
S	Policy-induced:							
	Price change [in %]			9.21	36.67	29.66	33.87	
	Quantity change [in %]			-6.36	-20.79	-17.71	-19.55	
	Expenditure change [in %]			2.26	8.26	6.70	7.70	
	Welfare effect on:							
	(1) Consumers [mn. ECU]			-7.97	-34.24	-30.25	-35.96	-108.42
	(2) Traders [mn. ECU]			-5.88	17.90	14.71	18.94	45.67
	(3) Welfare effect on the Swedish budget [mn. ECU]			13.60	12.69	12.78	13.42	52.49
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]			**-0.26**	**-3.65**	**-2.75**	**-3.60**	**-10.26**
	Relative to GDP [in % of GDP]			**-0.0001**	**-0.0018**	**-0.0014**	**-0.0018**	**-0.0051**

4.2 Tariff imposing countries

This group encompasses the five countries Belgium, Luxembourg, the Netherlands, Denmark and Ireland. The results suggest that all tariff-imposing countries belong to the losers of the new banana policy. All countries had to take a loss of aggregate welfare in all years with the exception of 1993. However, the year 1993 has to be treaded with caution, because the banana market regime was in force for only six months. In the years 1994 to 1998 the import prices and the expenditures increased considerably and the quantity decreased in all countries; so the consumers lost welfare. As the prices increases exceeded the tariff imposed on the imports the traders captured quota rents and gained. Unlike in the case of the free trade countries we observe lower tariff income for the national budgets compared to the hypothetical income under the old regime in almost all years. This means that also the national budgets of these countries were negatively affected.

Belgium and Luxembourg were the most affected countries in this group. Aggregate welfare decreased by ECU 52.5 mill. over the whole period, the decrease in consumer surplus amounted to ECU 135.6 mill. The aggregate welfare loss relative to GDP lay between 0.0011% and 0.0076%.

Table 6: Economic impact on the **tariff imposing countries**

		1993	1994	1995	1996	1997	1998	1993 - 1998
BLX	Policy-induced:							
	Price change [in %]	4.09	29.85	70.39	56.84	34.87	34.00	
	Quantity change [in %]	-4.81	-27.47	-48.07	-42.50	-30.78	-30.23	
	Expenditure change [in %]	-0.92	-5.82	-11.52	-9.82	-6.64	-6.50	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	-2.55	-17.37	-37.19	-32.72	-22.57	-23.21	-135.61
	(2) Traders [mn. ECU]	-1.06	11.52	24.57	23.30	14.23	13.86	86.42
	(3) The Dutch budget [mn. ECU]	1.52	0.17	-3.41	-3.71	0.61	1.46	-3.36
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**-2.09**	**-5.67**	**-16.03**	**-13.13**	**-7.73**	**-7.89**	**-52.54**
	Relative to GDP [in % of GDP]	**-0.0011**	**-0.0029**	**-0.0076**	**-0.0062**	**-0.0036**	**-0.0035**	**-0.0249**
NL	Policy-induced:							
	Price change [in %]	12.84	39.60	54.62	45.65	43.65	53.56	
	Quantity change [in %]	-12.45	-17.40	-19.70	-16.69	-15.80	-18.20	
	Expenditure change [in %]	-1.21	15.30	24.15	21.34	20.96	25.62	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	-9.92	-30.93	-45.14	-39.70	-38.94	-49.41	-214.04
	(2) Traders [mn. ECU]	14.75	38.74	51.72	47.74	47.05	57.79	257.79
	(3) The Dutch budget [mn. ECU]	-5.40	-12.56	-13.76	-13.88	-13.68	-16.06	-75.34
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**-0.57**	**-4.76**	**-7.18**	**-5.84**	**-5.57**	**-7.68**	**-31.6**
	Relative to GDP [in % of GDP]	**-0.0002**	**-0.0017**	**-0.0024**	**-0.0019**	**-0.0018**	**-0.0023**	**-0.0103**
DK	Policy-induced:							
	Price change [in %]	0.20	61.87	71.93	61.86	73.07	92.58	
	Quantity change [in %]	-0.07	-27.97	-30.83	-27.91	-31.15	-35.96	
	Expenditure change [in %]	0.14	16.60	18.92	16.67	19.17	23.33	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	-0.05	-13.09	-16.01	-14.66	-17.35	-22.01	-83.17
	(2) Traders [mn. ECU]	0.36	12.46	15.09	14.77	16.95	20.09	79.72
	(3) The Danish budget [mn. ECU]	0.16	-2.42	-3.02	-3.53	-3.89	-4.01	-16.71
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**0.47**	**-3.06**	**-3.94**	**-3.42**	**-4.30**	**-5.92**	**-20.17**
	Relative to GDP [in % of GDP]	**0.0004**	**-0.0024**	**-0.0029**	**-0.0024**	**-0.0029**	**-0.0038**	**-0.014**
IRL	Policy-induced:							
	Price change [in %]	-8.17	32.69	36.03	45.87	31.47	27.45	
	Quantity change [in %]	5.06	-15.11	-16.33	-19.64	-14.66	-13.11	
	Expenditure change [in %]	-3.52	12.63	13.82	17.21	12.20	10.74	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	1.66	-6.19	-6.81	-9.01	-7.00	-6.06	-33.41
	(2) Traders [mn. ECU]	-0.91	5.00	6.31	8.47	6.57	5.09	30.53
	(3) The Irish budget [mn. ECU]	0.57	0.20	-0.63	-1.07	-0.68	0.05	-1.56
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**1.32**	**-0.99**	**-1.12**	**-1.62**	**-1.11**	**-0.92**	**-4.44**
	Relative to GDP [in % of GDP]	**0.0031**	**-0.0022**	**-0.0022**	**-0.0028**	**-0.0016**	**-0.0012**	**-0.0069**

4.3 ACP supplied countries

The two EC countries, formerly supplied by ACP countries, were affected less severe by the banana market policy. If we do not consider the year 1993 we find out that the aggregate welfare change is rather low. In the years 1994 and 1995 Italy had to take a loss whereas in the years 1996 to 1998 it gained a little. Only for 1993 we found a remarkable welfare gain in Italy, but – as already mentioned – this result should be interpreted with caution because the regulation came into force in the middle of 1993. This comparably high gain in 1993 accounts for the bigger part of the total welfare gain of ECU 22.6 mill. The welfare change in the United Kingdom is much lower than in Italy and apart from 1993 positive. In the aggregate the welfare of the UK was hardly affected, over the five years from 1993 to 1998 it achieved a small welfare gain of ECU 0.9 mill.

In both countries the government lost tariff revenues for their budgets in most of the years. With respect to the consequences for the consumer and traders the situation differs. In Italy consumers incurred a loss in 1994 and 1995 on the one hand and received a gain in the years 1996 to 1998 on the other hand. For the traders the situation was quite to the contrary. They gained in 1994 and 1995 and lost in the years 1996 and 1998. Import prices and expenditure developed in the same way like the welfare effect on the traders. They increased in 1994 and 1995 and decreased in the three subsequent years. The import quantities behaved inversely to the prices. In the United Kingdom the change in consumer surplus was positive whereas the change in traders rent was negative (with the exception of 1997 and 1998). The import prices and the expenditures were lower and the quantities higher than they would have been under the old regime. The differences between the prices, quantities and expenditures in both countries were rather low compared to the other groups of countries.

In contrast to overall free trade countries and the tariff imposing countries, the ACP supplied countries are overall winners of the banana market policy, whereas

their traders are the losers. The redistribution of welfare from the traders to the consumer is plausible, since the import prices decreased in both countries and in almost all years. This price reduction occurred because for the ACP supplied countries the introduction of the new regime meant a (slight) liberalization of the foreign trade policy.

Table 7: Economic impact on the **ACP supplied countries**

		1993	1994	1995	1996	1997	1998	1993 - 1998
I	Policy-induced:							
	Price change [in %]	-16.59	5.95	5.66	-6.63	-8.19	-10.59	
	Quantity change [in %]	21.65	-6.06	-5.78	7.70	9.67	12.85	
	Expenditure change [in %]	1.47	-0.46	-0.44	0.55	0.69	0.90	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	48.68	-16.09	-15.00	22.26	30.67	43.47	113.99
	(2) Traders [mn. ECU]	-35.10	16.14	20.51	-11.96	-21.48	-37.97	-69.86
	(3) The Italian budget [mn. ECU]	4.35	-2.88	-8.13	-7.70	-5.85	-1.35	-21.56
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**17.92**	**-2.83**	**-2.62**	**2.60**	**3.33**	**4.15**	22.55
	Relative to GDP [in % of GDP]	**0.0021**	**-0.0003**	**-0.0003**	**0.0003**	**0.0003**	**0.0004**	0.0025
UK	Policy-induced:							
	Price change [in %]	-23.97	-6.20	-4.08	-4.19	-2.08	-2.20	
	Quantity change [in %]	17.09	3.75	2.43	2.50	1.22	1.29	
	Expenditure change [in %]	-10.98	-2.68	-1.75	-1.80	-0.89	-0.94	
	Welfare effect on:							
	(1) Consumers [mn. ECU]	87.25	23.09	15.26	17.26	10.82	12.63	166.31
	(2) Traders [mn. ECU]	-82.39	-11.90	-3.69	-2.78	5.73	1.18	-93.85
	(3) The British budget [mn. ECU]	-5.65	-10.85	-11.24	-14.12	-16.25	-13.48	-71.59
	Aggregate welfare change:							
	Absolute terms (1+2+3) [mn. ECU]	**-0.79**	**0.34**	**0.32**	**0.36**	**0.29**	**0.33**	0.85
	Relative to GDP [in % of GDP]	**-0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	-0.0001

4.4 Countries with own production

Four members of the European Union produce bananas on their own. These countries are France, Greece, Portugal, and Spain. In France the bananas produced in the overseas departments and demanded in the European part of France were regarded as imports in the foreign trade statistics until 1995 (for details see section 3.2.3). Consequently the economic impact can be estimated with the same method

that we have used for analyzing the other groups. In Portugal the domestically produced bananas covers just less than 10% (data of 1998, see Table 1) of the demand. Therefore production can be neglected in the analysis without severely affecting the results and the welfare effects can be computed with the method we have used so far. For these two countries we report the same indicators as for all countries of the other groups.

The situation in Greece and Spain was completely different. Spain had been an almost closed market before the banana market regulation came into force (Table 1). The demand had been completely met by the domestic production. After the introduction of the new regime the import share has increased but has not exceeded a level of 40% so far. From a technical point of view the estimations can not be carried out with our standard approach and from an economic perspective, it would make no sense because the imports are small and negligible. Therefore we adopted the calibration approach described in section 3. In the Table 8 we report the change of the consumer and producer prices, and consumer and producer quantities in stead of the import prices, quantities and expenditures. Because we do not analyze the imports we compute the welfare effects on producers instead of that on the traders. Similarly, the Greek banana market was de facto a closed market until 1989. In the 90s banana imports steadily increased, but domestic production is still of a relevant size. This also precludes the use of our standard approach and requires a modified procedure as described in section 3. As a result we obtain the welfare effects on the Greek government, consumers and (again instead of the traders) on the Greek banana producers.

France and Greece are winners of the banana market regime shift, whereas the two other banana-producing countries Portugal and Spain lose welfare. In all four countries we found gains for the national budgets. In this group, the producers in Greece and Spain have to take a loss of producer surplus, whereas the traders in France and Portugal capture large quota rents.

France achieved a considerable aggregate welfare gain over the years. The gain lies between ECU 32.3 mill. and ECU 59.7 mill. Over the five years France gained ECU 314.8 mill, the highest gain of all EU countries in absolute terms. The French consumers gain because of the decrease in import prices. The banana traders obtained moderate gains due to the quota rents. Furthermore the French budget received higher tariff revenues from imports of Dollar bananas.

Greece also made a large profit from the new banana regime. It received the highest gain of welfare relative to GDP of all countries in the EU. This gain lay between 0.003% and 0.012% of GDP. The producers lost because of a decline of producer prices and consumers gained due to the decline in consumer prices. The positive effect on the consumers overcompensated the negative effect of the producers. Consumer prices declined because of cheaper imports. The Greek budget received higher tariff income compared to the old regime.

Portugal sustained the highest welfare loss relative to GDP of all EU members. The consumers lost a lot due to a sharp increase in consumer prices. The gains of the traders and of the Portuguese budget were only small.

Spain attained a small gain in aggregate welfare. On the one hand, there was a high positive change for consumer and on the other hand a small negative change for producers. The budget benefited from the increase in tariff revenues.

Table 8: Economic impact on the **countries with own production**

	1993	1994	1995	1996	1997	1998	1993 - 1998
F Policy-induced:							
Price change [in %]	-15.21	4.56	-7.66	-12.16	-7.00	-4.83	
Quantity change [in %]	8.23	-2.11	3.89	6.41	3.54	-8.03	
Expenditure change [in %]	-8.24	2.35	-4.07	-6.53	-3.71	-12.48	
Welfare effect on:							
(1) Consumers [mn. ECU]	50.77	-14.71	26.05	42.74	24.23	16.98	146.06
(2) Traders [mn. ECU]	-20.43	61.43	22.54	9.16	29.84	33.37	135.91
(3) The French budget [mn. ECU]	1.95	6.37	8.69	7.16	4.25	4.41	32.83
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**32.29**	**53.09**	**57.28**	**59.07**	**58.31**	**54.76**	314.8
Relative to GDP [in % of GDP]	**0.0030**	**0.0047**	**0.0048**	**0.0048**	**0.0047**	**0.0042**	0.0262
EL Policy-induced:							
Consumer price change [in %]	-16.47	-12.19	-9.56	-11.45	-12.11	-11.35	
Consumer quantity change [in %]	0.03	0.24	0.45	0.07	0.03	0.05	
Producer price change [in %]	-4.44	-4.09	-3.59	-4.04	-4.04	-4.04	
Producer quantity change [in %]	-0.11	-0.36	-0.48	-0.92	-0.75	-0.75	
Welfare effect on:							
(1) Consumers [mn. ECU]	6.32	2.18	1.49	3.59	5.21	3.96	22.75
(2) Producers [mn. ECU]	-0.81	-0.70	-0.60	-0.65	-0.65	-0.60	-4.01
(3) The Greek budget [mn. ECU]	3.91	3.73	1.79	2.08	2.61	1.81	15.93
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**9.42**	**5.20**	**2.68**	**5.02**	**7.17**	**5.16**	34.65
Relative to GDP [in % of GDP]	**0.0120**	**0.0062**	**0.0030**	**0.0052**	**0.0068**	**0.0048**	0.038
P Policy-induced:							
Price change [in %]	82.78	119.80	131.06	103.55	115.92	122.06	
Quantity change [in %]	-36.71	-44.97	-47.01	-41.67	-44.22	-45.39	
Expenditure change [in %]	15.69	20.96	22.43	18.74	20.44	21.26	
Welfare effect on:							
(1) Consumers [mn. ECU]	-21.29	-35.93	-50.98	-56.33	-80.01	-108.20	-352.74
(2) Traders [mn. ECU]	16.64	25.03	34.13	36.42	54.23	69.77	236.22
(3) The Portuguese budget [mn. ECU]	3.72	6.07	8.86	14.53	15.72	23.38	72.28
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**-0.92**	**-4.82**	**-7.99**	**-5.39**	**-10.06**	**-15.04**	-44.22
Relative to GDP [in % of GDP]	**-0.0013**	**-0.0065**	**-0.0099**	**-0.0063**	**-0.0112**	**-0.0158**	-0.051
E Policy-induced:							
Consumer price change [in %]	-25.22	-22.72	-19.13	-21.43	-23.85	-24.55	
Consumer quantity change [in %]	15.22	9.01	18.25	15.89	26.08	21.53	
Producer price change [in %]	-33.82	-52.87	-48.78	-40.00	-40.00	-40.00	
Producer quantity change [in %]	-39.83	-44.21	-29.40	-45.24	-19.94	-26.54	
Welfare effect on:							
(1) Consumers [mn. ECU]	49.31	35.18	26.49	28.11	35.16	37.66	211.91
(2) Producers [mn. ECU]	-50.52	-61.42	-57.38	-51.98	-50.37	-49.98	-321.65
(3) The Spain budget [mn. ECU]	8.49	16.37	15.59	18.62	17.00	17.81	93.88
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**7.29**	**-9.87**	**-15.30**	**-5.25**	**1.80**	**5.49**	-15.84
Relative to GDP [in % of GDP]	**0.0018**	**-0.0024**	**-0.0036**	**-0.0011**	**0.0004**	**0.0011**	-0.0038

4.5 Welfare impact on all groups and the EU

The changes in the banana market policy resulted in a total aggregate welfare loss in the EU countries of ECU 67.6 mill. over the investigation period from 1993 to 1998. In 1993, 1995, 1996 and 1998 we found a moderate loss. In the other two years the EU countries gained a little. In these years the loss of the consumers was more than compensated by the gains of the traders and the national governments. In 1993, the first year of the regime, the aggregate welfare change of the banana traders in the EU was - in contrast to most of the member states - negative, mainly because of the large loss in Germany. The changes in aggregate welfare relative to GDP fluctuate between -0.00018% (1993) and 0.00031% (1994). These very small values are not surprising because of the quantitatively negligible weight of the bananas in total consumption of an industrialized economy.

The consumers are the big losers of the new banana market regime. Over the period 1993 to 1998 they incurred a total aggregate welfare loss of ECU 1,407.7 mill. The big winners of the banana market policy are the traders and producers. Their gains amounted to ECU 557.8 mill. over the total period. On average national budgets were also favored by the new banana market policy; their additional tariff revenues made up ECU 782.3 mill.

The governmental budgets were affected positively each year, the highest gain occurred in 1994, the smallest in 1995. The consumers lost in each year with the exception of 1993. The traders achieved a welfare gain in every year, except 1993. In the year 1998 the consumer suffered the biggest welfare loss (ECU 443.4 mill), the traders received their biggest gain (ECU 252.6 mill) and the government the biggest tariff income (ECU 168.9 mill).

Table 9: Economic impact on the **four groups**

	1993	1994	1995	1996	1997	1998	1993 - 1998
Free trade countries:							
Welfare effect on:							
(1) Consumers [mn. ECU]	86.00	-104.58	-288.08	-325.63	-268.27	-349.22	-1249.78
(2) Traders [mn. ECU]	-227.32	-11.94	106.59	139.20	74.09	139.95	220.57
(3) The national budgets [mn. ECU]	67.21	107.80	132.85	135.12	159.66	154.90	757.54
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**-74.12**	**-8.72**	**-48.64**	**-51.31**	**-34.52**	**-54.36**	-271.67
Relative to GDP [in % of GDP]	**-0.0046**	**-0.0005**	**-0.0021**	**-0.0022**	**-0.0015**	**-0.0022**	-0.0131
Tariff imposing countries:							
Welfare effect on:							
(1) Consumers [mn. ECU]	-10.86	-67.58	-105.15	-96.09	-85.86	-100.68	-466.22
(2) Traders [mn. ECU]	13.14	67.71	97.69	94.28	84.80	96.83	454.45
(3) The national budgets [mn. ECU]	-3.15	-14.61	-20.82	-22.19	-17.65	-18.55	-96.97
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**-0.87**	**-14.48**	**-28.28**	**-24.00**	**-18.71**	**-22.41**	-108.75
Relative to GDP [in % of GDP]	**-0.0001**	**-0.0022**	**-0.0040**	**-0.0033**	**-0.0025**	**-0.0028**	-0.0149
ACP supplied countries:							
Welfare effect on:							
(1) Consumers [mn. ECU]	135.92	7.00	0.26	39.51	41.49	56.10	280.28
(2) Traders [mn. ECU]	-117.49	4.25	16.82	-14.74	-15.76	-36.78	-163.7
(3) The national budgets [mn. ECU]	-1.31	-13.73	-19.38	-21.81	-22.11	-14.83	-93.17
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**17.13**	**-2.49**	**-2.30**	**2.96**	**3.62**	**4.49**	23.41
Relative to GDP [in % of GDP]	**0.0010**	**-0.0001**	**-0.0001**	**0.0002**	**0.0002**	**0.0002**	0.0014
Countries with own production:							
Welfare effect on:							
(1) Consumers [mn. ECU]	85.12	-13.28	3.05	18.12	-15.41	-49.60	28
(2) Traders [mn. ECU]	-55.11	24.34	-1.31	-7.06	33.05	52.55	46.46
(3) The national budgets [mn. ECU]	18.08	32.54	34.93	42.39	39.58	47.41	214.93
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**48.09**	**43.60**	**36.67**	**53.45**	**57.22**	**50.37**	289.4
Relative to GDP [in % of GDP]	**0.0030**	**0.0026**	**0.0021**	**0.0029**	**0.0030**	**0.0025**	0.0161
European Union[1]							
Welfare effect on:							
(1) Consumers [mn. ECU]	296.18	-178.44	-389.92	-364.09	-328.05	-443.39	-1407.71
(2) Traders [mn. ECU]	-386.79	84.36	219.79	211.68	176.18	252.55	557.77
(3) The national budgets [mn. ECU]	80.83	112.00	127.58	133.51	159.49	168.93	782.34
Aggregate welfare change:							
Absolute terms (1+2+3) [mn. ECU]	**-9.77**	**17.91**	**-42.54**	**-18.90**	**7.62**	**-21.91**	-67.59
Relative to GDP [in % of GDP]	**-0.0002**	**0.0003**	**-0.0007**	**-0.0003**	**0.0001**	**-0.0003**	-0.0011

[1] 1993 and 1994: EU-12, 1995 to 1998: EU-15 (incl. the new members Austria, Sweden and Finland).

Among the groups of countries the biggest losers are the former free trade countries. Their total loss amounted to ECU 271.7 mill. over the six years. The biggest loss could be observed in 1993. In this year the free trade countries (consisting only of Germany) lost 0.0046% of GDP. The countries with own production received the biggest gain. Their gain amounted to ECU 289.4 mill. These countries won between 0.0025% and 0.003% of GDP. The ACP supplied countries achieved a small gain of some ECU 23.41 mill. The tariff imposing countries belong also to the losers. Their aggregate surplus decreased by ECU 108.8 mill, due to a high loss for consumers (higher import prices) and the budget (lower tariff income).

In a recent paper, Borrell (1999) estimated the aggregate loss in the European Union as being much higher. He found a loss of US$ 2 billion in consumer welfare per year. This loss is significantly higher than the results of our study (ECU 234.7 million per year) because Borrell compared the EU banana regime with a situation of free trade for the whole European banana market. In contrast to Borrell we compared the welfare in the current situation with the old external trade regimes and estimated the welfare policy induced changes. Thereby we can also identify some winners of the regime shift which partly compensate the welfare losses.

The EU's Common Market Organization for bananas (COMB) has been slightly modified in 1998, coming into force in 1999 (see Table 4). In order to roughly estimate the welfare impact in 1999 and 2000, we can take our estimates of the period 1998, in which the EU as a whole suffered a welfare loss of some ECU 22 mill. per year. If one assumes that the slight tariff reduction for within the quota-imports from non-traditional ACP and third-country suppliers from ECU 100 per ton to Euro 75 per ton mitigated the negative welfare impact by the equal relative amount (25%), an extrapolation of the 98 average value would then lead to a welfare loss of the EU amounting to some ECU 16.5 mill. in 1999 (= 0.75*22). Taking the same value for the year 2000, the cumulated welfare loss over the

whole history of the COMB (1993 to 2000) for the aggregate EU makes up some ECU 100 mill. (or cumulated – 0.0012 per cent of EU-GDP). Similar calculations for the three differently affected groups suggest a cumulated welfare loss for European consumers of ECU 2073 mill. over the period 1993 to 2000, a gain of the traders amounting to ECU 937 mill. and a gain of the governments of some ECU 1036 mill. Thus, one can see that while the aggregate deadweight loss is negligibly small, a considerable redistribution of welfare form the consumers to the state and the traders has taken place. Additionally a welfare redistribution within the EU took place: the formerly most liberalized countries lost whereas the formerly severely regulated countries won.

The reform of the COMB proposed in 2000 and coming into force in 2001 with a the perpetuation of the tariff-quota system (with tariff reductions according to the EC commitments of the Uruguay Round) in the transitional period until 2006 (thereafter a tariff-only system) will basically have the same impact on the EU member states as the existing COMB. Only after 2006 – thanks to the Uruguay Round concessions – one can expect that the banana imports more an more converge to a free market system.

4.6 The world-wide impact of the EU's banana import regime – some illustrative figures

The COMB of the EU was and still is harmful for the world trade in bananas. As we demonstrated explicitly in the previous chapters (see also Table 9 for the overall results), this regime was counterproductive in particular for EU consumers. Due to the comprehensive assistance program of the EU the domestic producers were subsidized and the former colonies in the traditional ACP countries were preferred in importing bananas. Winners were the operators (traders) of banana licenses (and/or producers) and the states (or the EU budget as a whole). Whether the tariff revenues of around ECU 140 mill. per year were

enough to subsidize the EU producers is question, we cannot answer here. Whether the trade preferences for the traditional ACP banana suppliers are a good substitute for a direct development aid policy is also an open question. Nevertheless, for the first time our study calculated explicitly the welfare impact of the COMB for the EU member states and for the EU as a whole. In addition to the direct welfare losses the EU suffered from this system, one must add the losses due to the retaliatory measures (trade sanctions) implemented by the USA (US$ 191.4 mill. per year) and potentially by the other complainants at WTO (the cross retaliation measures of Ecuador US$ 201.6 mill. per year, although the latter is not binding for the EU; and the others not yet authorized for such measures).

In order to get a full picture of the harmfulness of the COMB for world trade we have also to consider the producer side, in particular the potential welfare losses which occurred in the non-traditional ACP and in the third-countries. We can make a rough back-on-the envelope estimation by starting from the WTO calculations of the costs of impairments the complainants. In case of the USA not lost trade gains were the basis for such calculations but the lost service business of US fruit companies (like Chiquita and Del Mol). In the case of Ecuador the calculation was based on lost market shares of those bananas distributed in the EU by Ecuadorian service suppliers. However, WTO based its calculation on an the wrong assumption, that Ecuador's exports to the EU peaked in 1992. Actually, the peak was in 1997 (WT/DS27/ARB/ECU, p. 35)! If we start with the trade losses of Ecuador, we can approximately derive the potential losses for the other complainants (Guatemala, Honduras; and Costa Rica, Colombia, Mexico, Nicaragua and Panama).

Table 10: The World Market for Bananas in 1999

	Leading suppliers (producers)		**Leading exporters**		**Leading importers (consumers)**		**Exports minus pro-duction**	**Apparent con-sumption**[1]	
	Mio. tons	Rank	Mio. tons	Rank	Mio. tons	Rank	Mio. tons	Mio. tons	Rank
India	11,000	1	8	18	-		-10,992	10,992	1
Ecuador	6,392	2	3,966	1	-		-2,426	2,426	6
Brazil	5,528	3	81	11	0	10	-5,447	5,447	2
China,	4,410	4	68	13	481	3	-4,341	4,822	3
Philippines	3,561	5	1,320	4	-		-2,241	2,241	7
Indonesia	3,166	6	76	12	0	9	-3,090	3,090	5
Costa Rica	2,101	7	2,523	2	22	5	422	400	14
Mexico	1,737	8	174	8	0	12	-1,563	1,563	9
Thailand	1,720	9	7	17	-		-1,713	1,713	8
Colombia	1,570	10	1,856	3	41	4	286	245	16
Burundi	1,511	11	-		-		-1,511	1,511	10
Vietnam	1,243	12	10	16	-		-1,233	1,233	11
Cameroon	990	13	165	9	-		-825	825	13
Honduras	861	14	155	10	5	7	-706	1,010	12
Panama	750	15	593	5	0	11	-157	157	18
Guatemala	733	16	536	6	0	8	-197	187	17
Dominican Rep.	432	17	67	14	-		-365	365	15
Nicaragua	75	18	36	15	8	6	-39	47	19
12 traditional ACP countries	1,975	(7a)	677	(4a)	0	(12a)	-1,298	1,298	(9a)
EU-15 (excl. Intra-Trade)	426	(17a)	28	(15a)	3,119	(2)	-398	3,517	(4a)
USA	11	19	419	7	4,295	1	408	3,888	4
World	58,849		14,673		14,047		-44,176	58,233	

[1] Apparent consumption = production + imports – exports.
Source: FAO-Statistics On-line.

The world market for bananas exhibits the following supply-demand characteristics (see Table 10):

1) Not all leading producers are leading exporters. Ecuador is the second largest producer and the largest exporter. India and Brazil are the first and third largest producers, but rank as exporters only 18 and 11. The 12 traditional ACP countries produce together less than Costa Rica. As exporter, however, this country group ranks before Panama.

2) Measured by apparent consumption, India is the largest consumer of bananas, followed by Brazil, China, the United States and EU-15.

3) The leading importers of bananas are the USA, closely followed by EU-15.

4) Some countries export more than they produce. These countries are Costa Rica, the USA and Columbia. This indicates that these countries are more traders than producers or that they are heavily involved in the license trading.

5) Looking at the general export performance, one can see the following development:

(a) The traditional ACP countries (*"Traditional ACP bananas"*) which are preferred by EU's banana import regime, exhibit a mixed picture: Four out of twelve ACP countries could double their export volumes from 1992 to 1999; Surinam's exports stagnated, whereas in seven countries exports decreased dramatically. Overall the world market share of ACP-12 declined steadily from 7% in 1992 to 4.6% in 1999 (see Figure 1a). What a success of the COMB as an instrument of development aid!

(b) The major part of the non-traditional ACP countries (*"Non-traditional ACP bananas"*) and the third-countries (mainly in Latin America; *"Third country"* or *"Dollar bananas"*) performed not so bad at all: Out of the eight Latin American countries (Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama) five countries could improve their exports from 1992 to 1999. Only Honduras, Nicaragua and Panama suffered as decline in the same period. The three countries with the largest export market shares are Ecuador (it increased from 23.1% in 1992 to 27% in 1999 with a peak of 30.7% in 1997), Costa Rica (slight increase from 15.4% in 1992 to 17.2% in 1999) and Colombia

(stagnation: 12.3% in 1992 and 12.7% in 1999; see Figure 1a). The (as a rule smaller) world market share of the other Latin American countries declined over the last decade, the most distinctively that of Panama (from 8% in 1992 to 4% in 1999), Honduras (from 8.4% to 1.1%), whereas the performance of Mexico (1.7% and 1.2%) and Nicaragua (1% and 0.3%) declined less dramatically (see Figure 1a).

(c) The export performance of the USA did actually steadily improve since 1992 from an export volume of 338 mill. tons to 419 mill. tons in 1999. The USA world export market share declined steadily from 3.6% in 1992 to 2.9% in 1999 (see).

6) The general world market share situation is a mirror image of the banana market situation in the EU, because the EU is the second largest world importer of bananas.

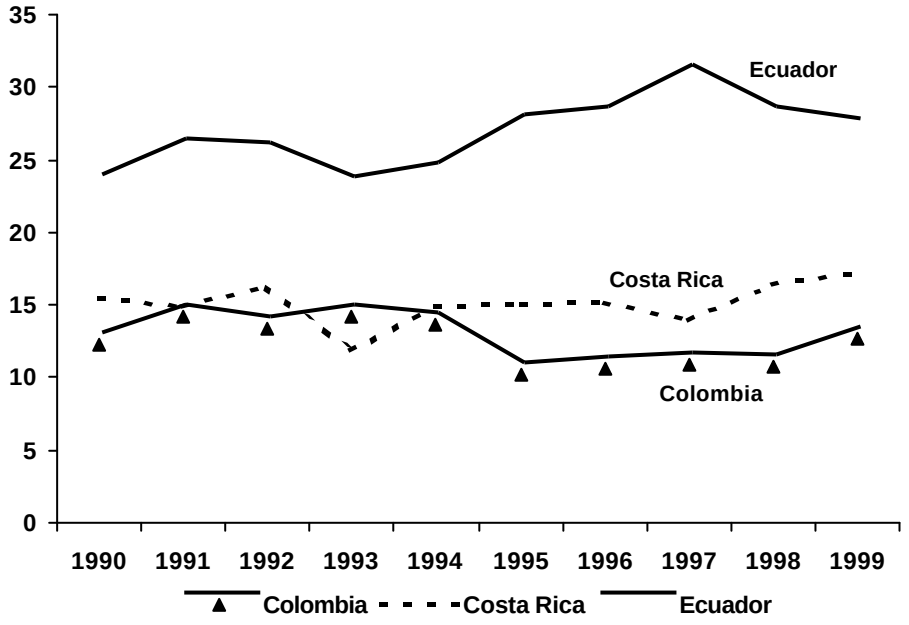


Figure 2: Latin American banana exporters (large, increasing world market shares in %)

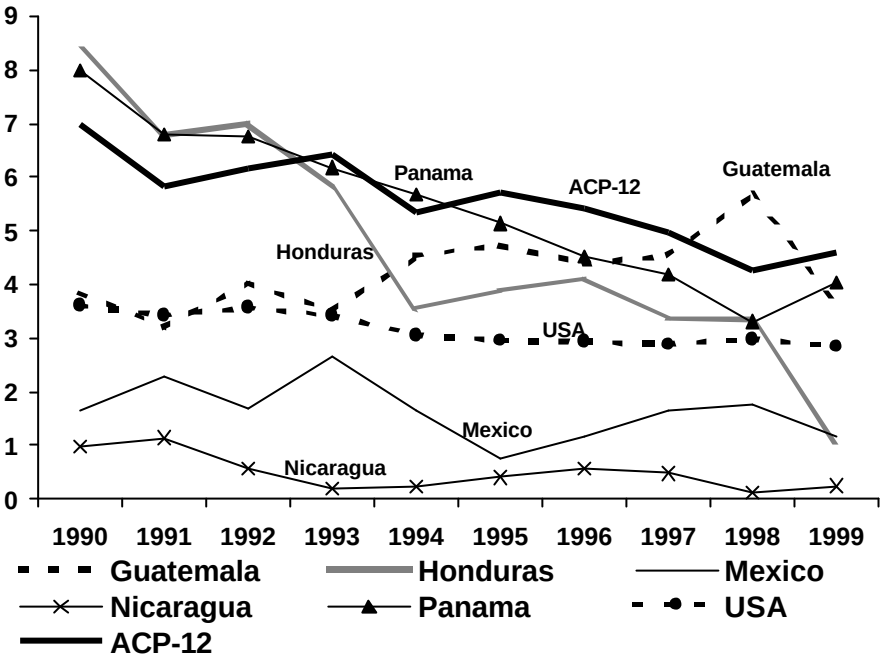


Figure 3: Latin American banana exporters+USA+ACP-12 (small, declining world market shares in %)

If the COMB would have really improved the export performance of the preferred 12 traditional ACP countries (which it did not) and clearly hampered the market position of the non-traditional ACP countries and the Latin American third-country suppliers, the welfare calculation were relatively easy. One could make the assumption that without a change in the banana import regime of the EU, c.p. the market shares should. have been at least kept on the levels before 1993. Then one could evaluate the difference of the actual volumes exported now with the unit value at the beginning of the regime change. Theoretically, there should be welfare gains in the 12 ACP countries and losses in the other countries. Unfortunately, the picture is – as demonstrated before - rather mixed. Should the declining world market share of the ACP-12 indicate a welfare loss of that country group? Why did WTO calculate the costs of impairment for Ecuador as being 201.6 mill. US$ per year, although this country could improve its world

market share in the last decade? The same is true for the other large suppliers Costa Rica and Colombia. Only the other Latin American suppliers lost market shares.

5 Conclusions

Until 1993, the EU countries had separate, widely differing national banana market policies. On 1 July 1993, the EU's common organization of the market in bananas came into force and replaced the mosaic of separate national banana markets by a unified banana trade policy. The regulation established a combined quota-tariff regime with preferential access for ACP and EU suppliers. In this paper we analyze the welfare effects of the new banana market regime from a European perspective, i.e. the impact on the EU countries and its (re)distributional implications on a national level between the differently affected groups (consumers, banana traders and the national governments).

Due to the formerly heterogeneous banana market regime the effects vary widely among the countries. According to the former market organization four groups can be distinguished, namely the free trade countries (Austria, Finland, Germany, Sweden), the tariff imposing countries (Belgium, Luxembourg, Denmark, Ireland, the Netherlands), ACP supplied countries (Italy, United Kingdom) and the countries with domestic banana production (France, Greece, Portugal, Spain).

The impacts of the new banana market regime on the welfare of all member states of the European Union are quantified over the period 1993 to 1998. For every country the policy-induced changes in import prices, quantities and expenditures are investigated and the welfare effects on consumers, traders and the governments as well as aggregate welfare change are computed. For all countries prices, quantities and expenditures are compared with the simulated hypothetical situation under their respective old regimes.

All free trade countries were net losers of the new banana regime in all years. The consumer surplus decreased. This loss has not been compensated by the gain of the traders and the government, resulting in a typical deadweight loss. The import price and the import expenditure increased considerably while the import quantity decreased. The quota restriction led to a decrease in the banana supply. Therefore the traders could increase their price by more than the tariff yielding large quota rents for them.

All tariff-imposing countries belong to the losers of the new banana policy as well. All countries had to take a loss of aggregate welfare in all years with the exception of 1993. However, the results for the year 1993 have to be treated with caution, because the banana market regime was in force only six months of the year 1993 (July-Dec.). In the years 1994 to 1998 the consumers lost and the traders won. In contrast to the free trade countries we observe lower tariff income for the national budgets compared to the (hypothetical) old regime in almost all years. In the years 1994 to 1998 the import prices and the expenditures increased considerably and the quantity decreased in all countries of this group.

The two former ACP supplied countries were less effected by the banana market policy. We find out that the aggregate welfare change is moderate. In both countries the government lost tariff income for their budgets in almost all years, the consumers received a gain and the traders incurred a loss. The redistribution of welfare from the traders to the consumer is plausible since the import prices decrease in both countries and in almost all years. This price reduction occurred because for the ACP supplied countries the introduction of the new regime meant a (slight) liberalization of the foreign trade policy.

In countries which have their own production the situation is different. France and Greece are winners of the banana market regime shift, whereas the two other banana-producing countries Portugal and Spain lose welfare. In all four countries we found gains for the national budgets. In Greece and Spain the producers have

to take a loss of producer surplus. The traders in France lose, whereas the traders in Portugal win. The consumers win in Greece, Spain and France and lose in Portugal.

The results show that the aggregate welfare loss of the consumers in the EU totals ECU 1408 mill. over the period 1993 to 1998. The gain for the international traders on the EU market and the EU producers amounts to ECU 558 mill. The national budgets of the EU member states' gained ECU 782 mill. due to the increase in tariff income. Consequently, in total about ECU 68 mill. welfare were lost in the European Union. The welfare effects relative to the GDP as well as for each consumer are very low. In percentage of GDP the aggregate welfare loss of the whole EU over the period 1993 to 1998 amounts to less than 0.001 percent each year. The welfare loss per consumer and year on average amounts to ECU 0.7 percent of GDP. We also calculated the welfare effects over the period 1993-2000 by extrapolating the 1998-value for the years 1999 and 2000. This approximation yields a cumulated deadweight loss of some 100 mill. ECU for the total EU over the whole period.

An additional negative impact on welfare from a European point of view arises from the penalty tariffs, which have been already mentioned in the introduction. A complaint of the United States (together with Ecuador, Guatemala, Honduras and Mexico) at the WTO resulted in a decision which allows the United States to impose tariffs amounting to US$ 191.4 million on European exports to the United States. Due to the recent consensus between the USA and the EU to solve the banana dispute, these sections will be abolished soon.

Despite some modifications of the regulation its discriminatory nature still has been retained for a long time. Only recently, after a costly detour of over seven years, the European Union has finally modified its banana import regime to be acceptable for the USA. In spite of the recent changes, however, the EU's banana

import regime is still far away from being a free trade regime and thus, still implies negative welfare effects for the European Union.

Given the legal problems, the doubts concerning the effectiveness of the trade policy as aid policy, and the results of our study European policy-makers have to ask themselves whether to continue a policy that causes huge costs for consumers and fails to reach its declared goal for the sake of the European banana traders which are the only ones, who have greatly benefited from the Common Banana Market Regulation.

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7 Appendices

Appendix 1: Estimation in the case of Germany

Before the common banana regime came into force there had been no restrictions on banana imports. At that time Germany imported almost only Dollar-bananas. After the regime shift in 1993 we can observe a sharp increase in the import price of the Dollar-bananas. Nevertheless the share of imports from other countries remained negligible.

First Step: Estimation of the banana import demand function q^D

$$\mathrm{LOG}(q^D) = 13.157 - 1.080*\mathrm{LOG}(p) + 0.058*TREND + u_t \qquad \text{(A1)}$$

(121.24) (-3.577) (7.057)

Adjusted R-squared: 0.832 F-statistic: 38.026 Durbin-Watson: 1.290

Estimation period: 1983 to 1998; t-values of the coefficients in parentheses.

Second Step: Forecast of the hypothetical price p^* *that would have materialised if no regime shift had taken place*

$$p^* = 1.272 - 0.024*TREND + u_t \qquad \text{(A2)}$$

(18.762) (-2.950)

adjusted R-squared: 0.412 F-statistic: 8.702 Durbin-Watson: 1.102

Estimation period: 1981 to 1992; t-values of the coefficients in parentheses.

The resulting forecast of the price compared to the exchange rate adjusted import price $\hat{p}$ (see fourth step) is illustrated in Figure 4.

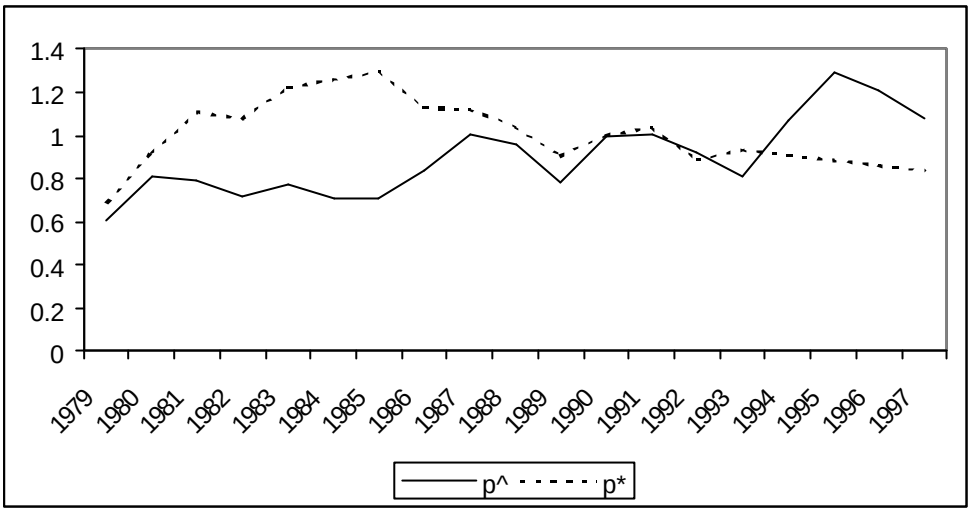

Figure 4: exchange rate adjusted import price ($\hat{p}$) and hypothetical import price (p^*) in Germany

*Third Step: Forecast hypothetical quantity q**

In the third step the hypothetical import quantity q^* is forecasted using the estimated import demand function (A1) and the forecasted price p^* from (A2).

$$LOG(q^*) = 13.157 - 1.080*LOG(p^*) + 0.058*TREND \quad \text{(A3)}$$

Estimation period: 1979 to 1998.

The hypothetical import quantity q* and the import quantity $\hat{q}$, forecasted with the exchange rate adjusted price $\hat{p}$ (see fourth step), are shown in .

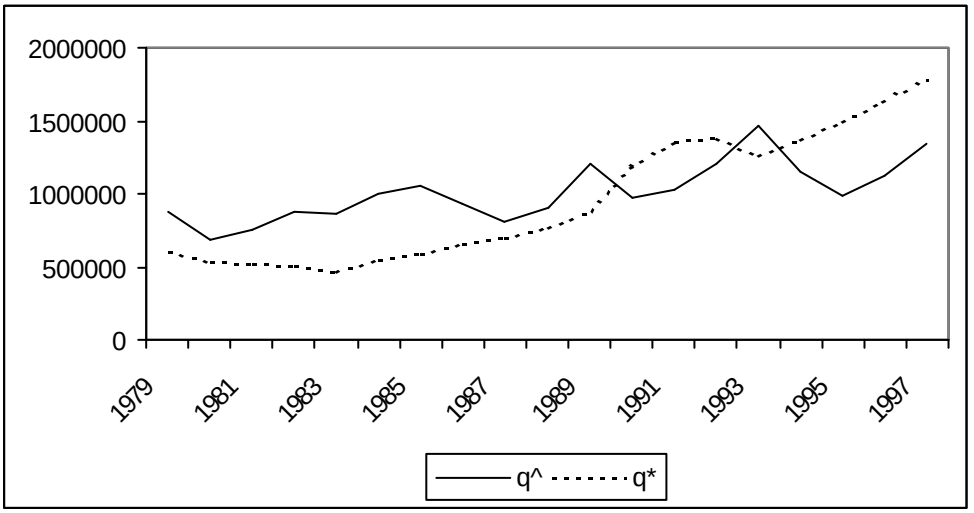

Figure 4: simulated import quantity ($\hat{q}$) and hypothetical import quantity (q^*) in Germany

Fourth Step: Adjustment of p for exchange rate effects and calculating the according quantity

The actual price over the period 1993 to 1997 is adjusted using the average exchange rate of the period 1990 to 1992 in order to screen the price development for pure exchange rate effects that are not due to the new regime. In the case of Germany the exchange rate only hardly changed, so that the adjusted level shown in Figure 4 and the actual level almost coincide.

Fifth Step: Calculation of welfare effects

Table 11: Welfare effects on Germany

Economic Variable	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Import price for bananas p [DEM/kg]	0.81	1.07	1.29	1.21	1.08	1.13
Hypothetical import price for bananas p^* [DEM/kg]	0.933	0.909	0.885	0.860	0.8362	0.812
Tariff – new regime [DEM/kg]	0.18	0.18	0.19	0.18	0.19	0.18
Hypothetical import price for bananas incl. new tariff $p^* + t^{new}$ [DEM/kg]	1.11	1.09	1.07	1.04	1.03	0.99
Price increase "caused" by traders: $p - (p^*+t^{new})$	-0.30	-0.02	0.22	0.17	0.05	0.14
Policy-induced impact on the import price for bananas [%]	-13.20	17.72	45.81	40.62	29.15	39.16
Imports of bananas q [t]	1,460,576	1,145,604	991,797	1,126,080	1,348,971	1,361,073
Hypothetical imports of bananas q^* [t]	1,253,499	1,366,398	1,490,611	1,627,433	1,778,338	1,944,999
Policy-induced impact on imports of bananas [%]	16.52	-16.16	-33.46	-30.81	-24.14	-30.02
Import expenditures for bananas [mn. DEM]	1,183.07	1,225.80	1,279.42	1,362.56	1,456.89	1,538.01
Hypothetical import expenditures for bananas [mn. DEM]	1,169.71	1,241.95	1,318.73	1,400.35	1,487.10	1,579.35
Policy-induced impact on the import expenditures for bananas [in %]	1.14	-1.30	-2.98	-2.70	-2.03	-2.62
Welfare Effects of the new banana trade regime [mn. DEM]						
Consumers	166.50	-201.31	-489.92	-470.91	-376.54	-515.06
Traders	-440.10	-22.99	214.23	190.59	73.47	187.44
Budget	130.11	207.52	187.75	203.01	255.36	245.38
Aggregate welfare change [mn. DEM]	**-143.49**	**-16.78**	**-87.94**	**-77.31**	**-47.70**	**-82.25**

Economic Variable	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Welfare Effects of the new banana trade regime [mn. ECU]						
Consumers	86.00	-104.58	-261.43	-246.55	-191.72	-261.59
Traders	-227.32	-11.94	114.32	99.79	37.41	95.19
Budget	67.21	107.80	100.19	106.29	130.02	124.62
Aggregate welfare change [mn. ECU]	**-74.12**	**-8.72**	**-46.92**	**-40.48**	**-24.29**	**-41.77**
Welfare Effects of the new banana trade regime [% of GDP]						
Consumers	0.0053	-0.0060	-0.0142	-0.0131	-0.0103	-0.0136
Traders	-0.0139	-0.0007	0.0062	0.0053	0.0020	0.0050
Budget	0.0041	0.0063	0.0054	0.0057	0.0070	0.0065
Aggregate welfare change [% of GDP]	**-0.0045**	**-0.0005**	**-0.0025**	**-0.0022**	**-0.0013**	**-0.0022**

Appendix 2: Estimated demand functions

Free trade countries	
A	$LOG(q^D) = 13.616 - 1.119*LOG(p) + 0.023*TREND + u_t$ (39.530) (-6.800) (2.663) (estimation period: 1993 to 1998) adjusted R-squared: 0.791 F-statistic: 29.377 Durbin-Watson: 1.416
FIN	$LOG(q^D) = 11.283 - 0.791*LOG(p) + 0.742*DUMMY94 + 0.058*TREND + u_t$ (63.645) (-3.87) (4.773) (6.683) (estimation period: 1979 to 1998) adjusted R-squared: 0.842 F-statistic: 34.817 Durbin-Watson: 0.861
D	$LOG(q^D) = 13.157 - 1.080*LOG(p) + 0.058*TREND + u_t$ (121.24) (-3.577) (7.057) (estimation period: 1983 to 1998) adjusted R-squared: 0.832 F-statistic: 38.026 Durbin-Watson: 1.290
S	$LOG(q^D) = 11.978 - 0.746*LOG(p) + 0.079*TREND + u_t$ (58.594) (-4.412) (10.803) (estimation period: 1983 to 1997) adjusted R-squared: 0.905 F-statistic: 72.036 Durbin-Watson: 0.852
Tariff imposing countries	
BLX	$LOG(q^D) = 14.745 - 1.230*LOG(p) + 0.047*TREND + [AR(1)=0.437]$ (11.651) (-2.898) (1.565) (1.266) (estimation period: 1980 to 1995) adjusted R-squared: 0.759 F-statistic: 16.769 Durbin-Watson: 1.718
NL	$LOG(q^D) = 11.396 - 0.464*LOG(p) + 0.048*TREND + [AR(1)=0.473]$ (131.555) (-2.463) (6.026) (2.057) (estimation period: 1980 to 1998) adjusted R-squared: 0.871 F-statistic: 41.40 Durbin-Watson: 1.838
DK	$LOG(q^D) = 11.048 - 0.680*LOG(p) + 0.049*TREND + u_t$ (69.697) (-4.480) (5.758) (estimation period: 1985 to 1998) adjusted R-squared: 0.709 F-statistic: 16.869 Durbin-Watson: 1.475

Tariff imposing countries (continued)	
IRL	$LOG(q^D) = 9.692 - 0.579*LOG(p) + 0.033*TREND + u_t$ (42.107) (-3.812) (4.468) (estimation period: 1979 to 1998) adjusted R-squared: 0.490 F-statistic: 10.136 Durbin-Watson: 1.456
ACP supplied countries	
I	$LOG(q^D) = 19.325 - 1.080*LOG(p) + 0.088*TREND + u_t$ (8.068) (-2.752) (3.391) (estimation period: 1986 to 1998) adjusted R-squared: 0.443 F-statistic: 5.769 Durbin-Watson: 1.991
UK	$LOG(q^D) = 11.758 - 0.576*LOG(p) + 0.078*TREND + u_t$ (176.70) (-11.097) (33.80) (estimation period: 1979 to 1998) adjusted R-squared: 0.989 F-statistic: 880.173 Durbin-Watson: 1.251
Countries with own production	
FR	$LOG(q^D) = 13.592 - 0.479*LOG(p) + 0.018*TREND + [AR(1)=0.638]$ (58.60) (-4.10) (1.916) (2.669) (estimation period: 1980 to 1998) adjusted R-squared: 0.881 F-statistic: 45.584 Durbin-Watson: 2.118
EL[1]	Estimated import demand function: $LOG(q_{imp}) = 15.984 - 1* LOG(p_{imp}) + u_t$ (estimation period: 1989 to 1998) Estimated domestic supply function: $LOG(q^S) = 3.394 + 1* LOG(p^P) + u_t$ (estimation period: 1979 to 1998)
P	$LOG(q^D) = 10.832 - 0.758*LOG(p) + 0.278*TREND + u_t$ (8.820) (-1.927) (6.209) (estimation period: 1989 to 1998) adjusted R-squared: 0.837 F-statistic: 34.433 Durbin-Watson: 0.862
E[1]	Estimated import demand function: $LOG(q_{imp}) = 16.440 - 1* LOG(p_{imp}) - 6.539*DUMMY93 + u_t$ (estimation period: 1989 to 1998) Estimated domestic supply function: $LOG(q_{prod}) = 8.848 + 1* LOG(p_{prod}) + u_t$ (estimation period: 1979 to 1998)

[1] Equations of demand and supply were calibrated assuming price elasticities of demand resp. supply of one percent.

Note: q^D ... import quantity, p ... import price, DUMMY94 ... dummy-variable of the year 1994
For E, EL: q_{imp} .. import quantity, p_{imp} .. import price, q_{prod} .. quantity produced p_{prod} .. producer price, t-values in parentheses .

Appendix 3: Price Trends and Forecasts[1]

Free trade countries	
A	$p^* = 7.725 - 0.062*TREND + u_t$ (13.744) (-0.972) (estimation period: 1979 to 1994) adjusted R-squared: -0.004 F-statistic: 0.945 Durbin-Watson: 0.602
FIN	$p^* = 2.931 + 0.002*TREND + u_t$ (6.124) (0.049) (estimation period: 1987 to 1994) adjusted R-squared: -0.166 F-statistic: 0.002 Durbin-Watson: 2.136
D	$p^* = 1.272 - 0.024*TREND + u_t$ (18.762) (-2.950) (estimation period: 1981 to 1992) adjusted R-squared: 0.412 F-statistic: 8.702 Durbin-Watson: 1.102
S	$p^* = 3.260 + 0.082*TREND + u_t$ (10.850) (2.580) (estimation period: 1981 to 1994) adjusted R-squared: 0.303 F-statistic: 6.656 Durbin-Watson: 1.449
Tariff imposing countries	
BLX	$p^* = 19.663 - 0.283*TREND + u_t$ (4.579) (-0.731) (estimation period: 1988 to 1992) adjusted R-squared: 0.151 F-statistic: 0.535 Durbin-Watson: 2.263
NL	$p^* = 0.810 + 0.012*TREND + u_t$ (5.644) (0.908) (estimation period: 1988 to 1992) adjusted R-squared: -0.046 F-statistic: 0.825 Durbin-Watson: 2.781
DK	$p^* = 3.846 - 0.048*TREND + u_t$ (15.877) (-1.629) (estimation period: 1981 to 1992) adjusted R-squared: 0.131 F-statistic: 2.654 Durbin-Watson: 1.068
IRL	$p^* = 0.320 - 0.0002*TREND + u_t$ (11.061) (-0.077) (estimation period: 1981 to 1992) adjusted R-squared: -0.099 F-statistic: 0.006 Durbin-Watson: 0.836
ACP supplied countries	
I	$p^* = 470.717 + 26.962*TREND + u_t$ (9.480) (4.153) (estimation period: 1979 to 1992) adjusted R-squared: 0.556 F-statistic: 17.250 Durbin-Watson: 0.594
UK	$p^* = 0.440 + 0.0005*TREND + u_t$ (14.290) (0.164) (estimation period: 1984 to 1992) adjusted R-squared: -0.138 F-statistic: 0.027 Durbin-Watson: 1.062
Countries with own production	
F	As no clear price trend before the new regime could be identified we forecasted the hypothetical price using the small decrease from 92 to 93, which was assumed to continue on a diminishing scale.
EL	As no clear price trend before the new regime could be identified we forecasted the hypothetical price as follows: p_{prod}: the average producer price of the period 1991-1992 was used as forecast for the period 1993-1998. p_{imp}: it was assumed that the price without regime shift would have been higher by 20% than the actual (exchange rate adjusted) level. This is based on the fact that the Greek market opened up with the new regime, so that one can assume that prices have dropped with the new regime. However, as the price level of bananas generally increased in Greece after 93 we assumed, that this increase would have been even stronger without regime shift.

Countries with own production (continued)	
P	As no clear price trend before the new regime could be identified, the average import price of the period 1991-1992 was used as forecast for the period 1993-1998.
E	As no clear price trend before the new regime could be identified we forecasted the hypothetical price as follows: p_{prod}: a constant price of 70PTE/ECU was forecasted for the period 1993-1998, which is approximately equal to the average producer price of the period 1989-1992 p_{imp}: the average import price of the period 1990-1992 was used as forecast for the period 1993-1998.

[1] In general we forecast the hypothetical price using a linear trend. Only in cases where this approach led to unrealistic results we had to use alternative procedures as taking the average of the last years before the regime shift (see Table).
Note: q^D ... import quantity, p ... import price, DUMMY94 ... dummy-variable of the year 1994
For E, EL: q_{imp} .. import quantity, p_{imp} .. import price, q_{prod} .. quantity produced p_{prod} .. producer price, t-values in parentheses .

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