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An Empirical Assessment of the Expected Impact of Some of the Options Considered for the Reform of the Internal Aspects of the Common Market Organization for Bananas

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Working Paper 06/13

TRADEAG is a Specific Targeted Research Project financed by the European Commission within its VI Research Framework. Information about the Project, the partners involved and its outputs can be found at http://tradeag.vitamib.com

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1. Introduction

On 1 January 2006 the European Union (EU) introduced a new import regime for bananas, removing the quota for imports occurring under MFN conditions, setting the MFN tariff equal to 176 €/t[1] and expanding the duty-free quota reserved for imports from ACP countries to 775,000 t. In addition, from 1 January 2006 the EBA initiative has been fully implemented for bananas.

In the Fall of 2005 the Commission decided to start the review process leading to a reform of the domestic aspects of the Common Market Organization (CMO) for bananas; an *ad hoc* Inter-Service Steering Group (ISG) was appointed to produce the mandated "impact analysis", with the aim of identifying the objectives of the reform, suggesting alternative policy options to achieve those objectives and offering a comparative analysis of their impact.

In April 2006 the ISG produced a "Consultation Document" (EU Commission, 2006) in which it outlined the context and objectives of the reform of the domestic aspects of the CMO for bananas and identified four policy options.

This report presents the results of a study conducted for the ISG. Although conducted independently, the study has been designed and carried out in close cooperation with the Services of the Commission. Its aim is to simulate the expected impact of some of the alternative policy options which have been identified, providing the ISG with additional elements on which to base its assessment.

This report describes the characteristics of the model developed and presents the results obtained. Because of its nature, the analysis of the results of the simulations which have been generated has been kept to a minimum.

The next section presents the structure of the model, the data used and the assumptions made. In section three the results of the simulations performed are presented. Section four contains an assessment of the sensitivity of the results obtained to the assumptions made with respect to some of the exogenous parameters used in the model.

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* : This study has been conducted for the European Commission "*Impact Analysis Steering Group for the reform of the internal aspects of the CMO for bananas*".

[1] A 75 €/t tariff was imposed within the quota which was eliminated, while the out of quota MFN tariff was 680 €/t.

2. The model

The model used is a revised and expanded version of the one used in Anania (2006). It differs from the previous one in two ways: the five EU banana producing member states are modelled individually and there is a more detailed representation of the domestic policy instruments currently in place in the EU.

The model used is a single commodity, spatial, partial equilibrium, mathematical programming model (Takayama and Judge, 1971), which considers five sources of domestic supply within the EU, fourteen exporting and eight importing countries/regions (Table 1). EU domestic production takes place in France (Martinique and Guadalupe), Spain (Canary islands), Portugal (Madeira), Greece (Crete) and Cyprus.

The base model time reference is 2002.

Import demand and export supply functions, as well as domestic supply functions in the EU, are assumed to be linear, or to be well approximated by linear functions in the portion relevant for the simulations conducted. Import demand and export supply functions in the base year are obtained from observed imported and exported quantities, observed import and export prices, and import demand and export supply price elasticities at the equilibrium in each country/region (Table 1); analogously, supply functions in the EU are obtained from observed quantities produced and relevant prices, and supply elasticities. The values of the elasticities used are exogenously determined; they are based on those used in other studies (Arias *et al*., 2005; Guyomard, Laroche and Le Mouël, 1999; Kersten, 1995; Spreen *et al.*, 2004; Vanzetti *et al.*, 2005). Sensitivity analyses with respect to some of the values of the elasticities used have been performed and the results obtained have proved to be robust.[2] The sources for the data in the model are the FAOSTAT and COMTRADE databases, the World Bank and the European Commission.

The representation of the EU-15 import regime in the 2002 base model includes:

(a) quota A/B: a 2,653,300 t import quota, with all imports occurring on a non-preferential basis subject to a 75 €/t tariff (ACP exports can enter quota A/B duty-free);

(b) quota C: a 750,000 t quota allocated to duty-free imports from ACP countries only;

(c) an out-of-quota MFN import tariff of 680 €/t (380 €/t for imports from ACP countries).

The 2002 base model calibration appears satisfactory (Table 1). The simple average percentage difference, in absolute value, between observed and predicted exports in 2002 is 5.3%;

[2] The results of the sensitivity analyses are presented in section 4.

the analogous value for imports is 4.8%. If the exports- and imports-weighted average per cent differences, in absolute value, are considered instead, the average differences drop to 2.7% and 2.6%, respectively.

In the 2002 base model solution both EU-15 Tariff Rate Quotas - quotas A/B and C - are binding; ACP exports to the EU-15 equal the C quota (750,000 t) and those by non-ACP countries equal the A/B quota (2,653,000 t).

Simulations for all policy scenarios considered have been generated with reference to three time horizons:

- 2007, the first year in which the market effects of the adjustments in production decisions as a result of the recent change in the EU import policy regime can be assessed (the new regime was introduced on 1 January 2006 and announced immediately before this date);
- 2009, when it is assumed that the Economic Partnership Agreement (EPA) between the European Union and the ACP countries will be in place; and
- 2013, which has been identified as an adequate time horizon to assess the medium term implications of the policy changes considered.

The 2002 base model has been "extended" to 2007:

(a) by modelling the 2004 enlargement of the EU-15 to the 10 new member states;

(b) by modelling the introduction of the EU tariff-only import regime introduced on 1 January 2006;

(c) by modelling the implementation of the EBA initiative;

(d) by modelling the changes in import demand and export supply functions in all countries/regions resulting from expected shifts in domestic demand and supply functions; and

(e) by assuming a €/$ exchange rate equal to 1.15.[3]

The 2004 EU enlargement has been modelled by removing barriers to trade between the 10 new member states and the EU-15 and by extending the import regime in place in the EU-15 to the new member states. Because of the provisions of the accession agreement, the CMO for bananas does not apply in Cyprus until 2009; hence, domestic policies for bananas in the model are assumed to apply in Cyprus only in the 2009 and 2013 scenarios.

[3] This is the exchange rate the EU assumes in its medium term forecasts for 2007; the exchange rate in 2002 was 0.9456. For the new member states it has been assumed that the exchange rates between their currencies and the US dollar change with the €/$ exchange rate (i.e. their exchange rates with respect to the Euro will remain constant).

Table 1 - Base model input data and model calibration (2002).

Country/Region	Base Net imports[1] (000 t)	*Estimated Net imports (000 t)*	Base Net exports (000 t)	*Estimated Net exports (000 t)*	Import prices ($/t)	Export prices[2] ($/t)	Export supply price elasticities	Import demand price elasticities	Domestic demand income elasticities
EU-15	4059,7	*4193,5*			588,6			-0,50	0,5
Czech Republic	99,6	*103,0*			495,7			-0,75	1
Slovakia	46,0	*46,4*			458,4			-0,80	1
Poland	232,0	*233,4*			446,3			-0,80	1
Hungary	101,6	*75,5*			391,5			-0,75	1
Other EU new member states	60,3	*60,8*			549,3			-0,80	1
USA	3490,4	*3411,0*			272,4			-0,40	0,4
Other importers	4510,3	*4433,9*			375,0			-0,80	0,5
Spain			407,3	*407,3*		681,5	1,0		
France			358,9	*358,9*		519,7	1,0		
Portugal			21,9	*21,9*		584,7	1,0		
Greece			2,4	*2,4*		719,8	1,0		
Cyprus			10,5	*13,3*		257,5	1,0		
Ivory Coast			256,0	*247,5*		289,1	1,5		0,5
Cameroon			238,4	*231,1*		217,1	1,5		0,5
Dominican Republic, Belize and Suriname			179,2	*171,7*		404,5	1,0		0,5
Jamaica, Windward Islands and other ACP non-EBA countries			156,2	*97,0*		455,1	1,0		0,5
ACP EBA exporters			2,6	*2,6*		205,1	1,5		0,5
Ecuador			4199,2	*4318,8*		223,0	1,3		0,5
Colombia			1418,1	*1347,8*		283,7	1,3		0,5
Costa Rica			1873,2	*1863,2*		264,3	1,0		0,5
Panama			403,9	*399,4*		270,9	1,0		0,5
Honduras			437,2	*441,2*		246,4	1,5		0,5
Brazil			241	*266,9*		156,1	1,0		0,5
Guatemala			974,0	*981,8*		221,7	1,5		0,5
Other MFN exporters			1327,9	*1338,5*		186,4	1,0		0,5
EBA non-ACP exporters			47,1	*46,1*		190,6	1,5		0,5

[1]: For EU-15 apparent consumption (imports + domestic production - exports).
[2]: For Spain, France, Portugal and Greece farm gate prices, including basic aid; for Cyprus farm gate price.

MFN imports are subject to a 176 €/t tariff only (they are not subject to any quantitative limitation); ACP countries are granted preferential duty-free access within a 775,000 t TRQ (out-of-quota ACP exports to the EU are subject to the MFN tariff).

Banana exports from EBA countries are assumed to enter the EU tariff-free and are not subject to any quantitative limitation.

Import demand and export supply functions shift according to expected changes, *ceteris paribus*, in the quantities produced and consumed in each country/region. Consumption has been assumed to change over time based on the per cent yearly change in population between 1990 and 2003, and the per cent yearly change in per capita income between 1997-1999 and 2000-2002 (in both cases the data source is the World Bank); the values used for domestic demand income elasticities are provided in Table 1. Production in each country/region is assumed to change over time in line with the observed per cent yearly change in banana yields between 1991-1993 and 2000-2002 (FAOSTAT).[4] Some of the parameters governing these shifts have been judged to be unsustainable over time; in particular, this was the case for (a) negative and (b) very high rates of change in yields, and (c) for extreme (both, positive and negative) rates of change in per capita incomes. As a result, per cent yearly yield changes above 5% have been replaced by 5%, and below 0% by 0%; per cent yearly per capita income changes above 7% have been replaced by 7%, and below -3% by -3% (Table 2).[5]

Observed yield changes between 1991-1993 and 2000-2002 are positive in Spain (+1.05% a year), France (+3.13%) and Cyprus (+5.65%), negative in Portugal (-2.75%) and Greece (-1.12%). If the period considered is long enough to allow medium term structural trends to be captured, trends in banana production in the EU are consistent with the observed signs for the changes in yields. In fact, between 1994 and 2005 banana production in France and Spain shows a clear positive trend,[6] while the opposite is true in Greece and Portugal; France and Spain being, by far, the most important banana producers in the EU, a positive trend is shown by total EU production of bananas as well (Figures 1-5).

In the 2009 and 2013 simulations it is assumed that the EPA is concluded and implemented. This means that ACP banana exports enter the EU duty-free and are not subject to any quantitative

[4] FAOSTAT is the source used for production and consumption in 2002 in all countries/regions as well.
[5] The use of the observed per cent changes in population and per capita income for the EBA countries, both ACP and non-ACP ones, would have had a marked negative effect on their export supply over time, leading to decreased or no exports. In order to make these countries more responsive to the structural change associated with the implementation of the EBA initiative than could be predicted on past performance, the rates of change of both variables for ACP and non-ACP EBA exporters have been set equal 0.
[6] The positive trend in France is the net result of trends in opposite directions in Martinique and Guadalupe (production increases in the former and declines in the latter).

restriction.

With respect to the developments in the WTO Doha Development Agenda round of negotiations, three alternative assumptions regarding its implications for market access are considered in the simulations:

(a) that no agreement is reached;

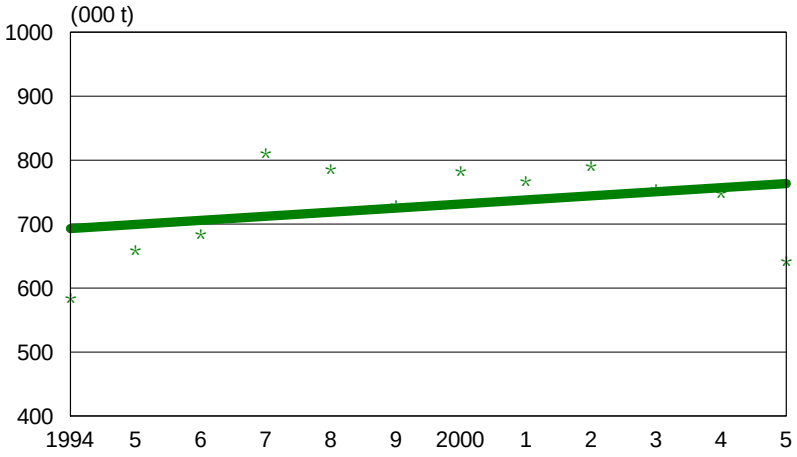
(b) that an agreement is reached which includes the EU November 2005 proposal for market access (this means a 45% reduction of the EU MFN tariff); and

Table 2 - Time shift parameters.

	unadjusted per cent yearly increase in			***adjusted* per cent yearly increase in***		
Country	***population***	***per capita income***	***yields***	***population***	***per capita income***	***yields***
Spain			1,05			1,05
France			3,13			3,13
Portugal			-2,75			**0**
Greece			-1,12			**0**
Cyprus			**5,65**			**5**
Ivory Coast	2,7	**-3,28**	2,38	2,7	**-3**	2,38
Cameroon	2,5	-2,6	**-8,28**	2,5	-2,6	**0**
Dominican Republic, Belize and Suriname	1,6	4,34	0,36	1,6	4,34	0,36
Jamaica, Windward Islands and other ACP non-EBA countries	2	-0,25	**-1,17**	2	-0,25	**0**
ACP EBA exporters	**2,5**	**0,37**	**-0,24**	**0**	**0**	**0**
Ecuador	1,8	**-4,16**	2,3	1,8	**-3**	2,3
Colombia	1,8	**-6,54**	0,02	1,8	**-3**	0,02
Costa Rica	2,1	**13,75**	0,26	2,1	**7**	0,26
Panama	1,7	4,62	**-0,51**	1,7	4,62	**0**
Honduras	2,8	6,83	**-8,84**	2,8	6,83	**0**
Brazil	1,4	**-11,57**	0,45	1,4	**-3**	0,45
Guatemala	2,6	2,11	**8,03**	2,6	2,11	**5**
Other MFN exporters	1,7	1,04	1,77	1,7	1,04	1,77
EBA non-ACP exporters	**2**	**5,11**	**-2,12**	**0**	**0**	**0**
EU-15	0,3	2,08		0,3	2,08	
Czech Republic	-0,1	0,97		-0,1	0,97	
Slovakia	0,1	1,08		0,1	1,08	
Poland	0	4,35		0	4,35	
Hungary	-0,2	2,93		-0,2	2,93	
Other EU new member states	-0,5	3,54	**5,49**	-0,5	3,54	**5**
USA	1,2	5,04	3,17	1,2	5,04	3,17
Other importers	1,1	0,44	3,44	1,1	0,44	3,44

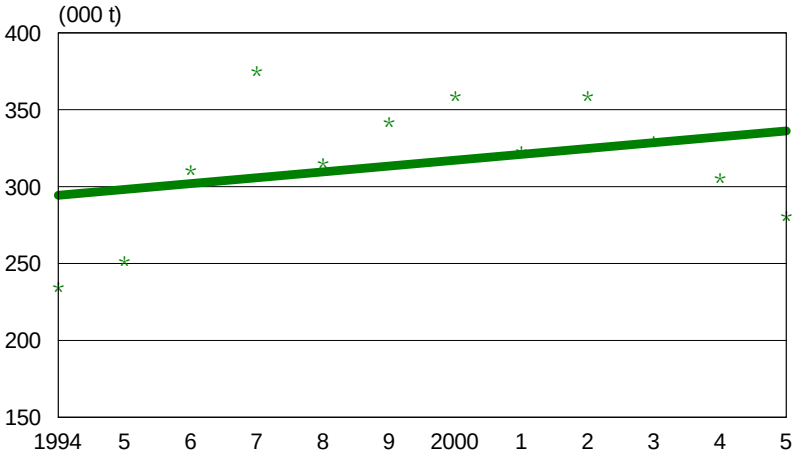
*: per cent yearly yield changes above 5% replaced by 5%, below 0% by 0%; per cent yearly per capita income changes above 7% replaced by 7%, below -3% by -3% . ACP and non-ACP EBA countries per capita income and population per cent yearly changes have been set equal to zero in order to make them more responsive to the structural change associated with the preferential treatment due to the implementation of the EBA initiative.

Figure 1 - EU-15, banana production
(values and and fitted linear trend; 1994-2005)



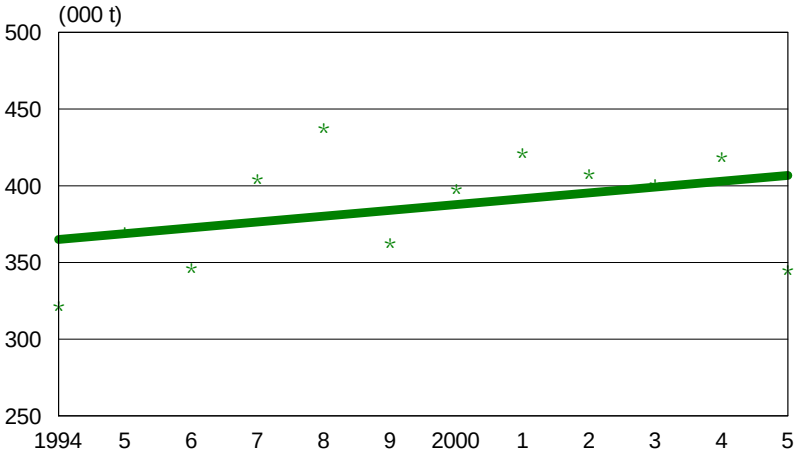
Souce: EU Commission.

Figure 2 - France, banana production
(values and and fitted linear trend; 1994-2005)



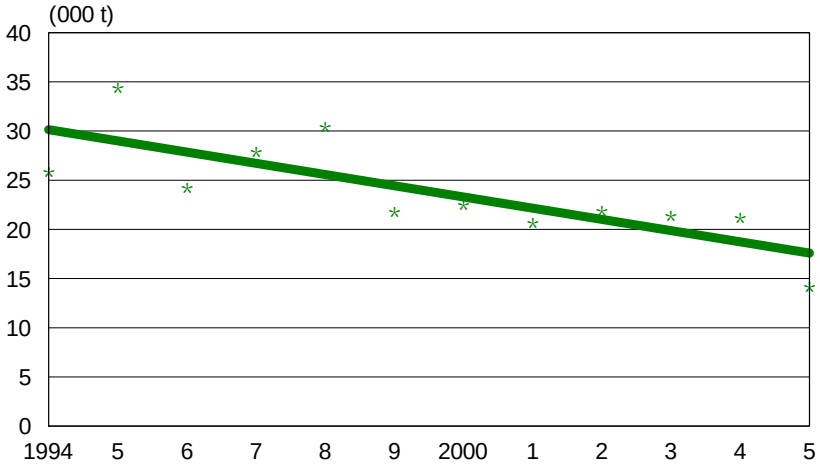
Souce: EU Commission.

Figure 3 - Spain, banana production
(values and and fitted linear trend; 1994-2005)



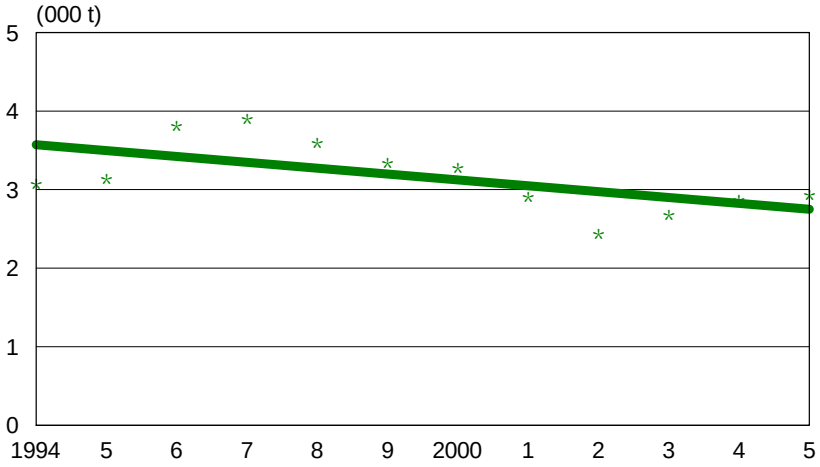
Souce: EU Commission.

Figure 4 - Portugal, banana production
(values and and fitted linear trend; 1994-2005)



Souce: EU Commission.

Figure 5 - Greece, banana production
(values and and fitted linear trend; 1994-2005)



Souce: EU Commission.

(c) that an agreement is reached which includes the G-20 October 2005 proposal for market access (MFN tariff to be reduced by 55%).

Under options (b) and (c) it is assumed that the bound rate to which the agreed percent reduction applies is 176 €/t,[7] that bananas are not included by the European Union among its "sensitive" products, and that the implementation period starts 1 January 2008 and lasts five years.

3. The policy options considered

The study considers four different policy scenarios, three of the four options identified by the ISG in its "Consultation Document" (EU Commission, 2006) plus a scenario which is provided as an extreme reference, to help put the other three in perspective.

The policy scenarios which have been modelled are:

(a) "Status quo";

(b) "Decoupling";

(c) "Memorandum";

(d) "Full liberalization" .

The fourth option identified by the ISG, "POSEI" - which foresees for the outermost regions the transfer of the financial resources currently absorbed by the CMO for bananas into the POSEI programmes, and for the other regions (Greece and Cyprus) the transfer into the "Single Farm Payment" regime (EU Commission, 2006) - has not been modelled because of the impossibility of making assumptions on the specific measures financed with the resources transferred into the POSEI programmes and, as a result, the impossibility to model the impact of these measures on the banana market.

In the "Full liberalization" scenario, which is not an option considered for the reform and is offered only as a reference scenario, it is assumed that all domestic and trade policy interventions are removed.

3.1 "Status quo"

In this scenario no change in the domestic aspects of the CMO for bananas takes place, but expected changes in market access conditions and in demand and supply functions are taken into account.

[7] What the current WTO MFN bound tariff actually is, at this point, is an open issue: the 176 €/t which the EU currently imposes on its MFN imports, or the prohibitive 680 €/t which the EU would have imposed on its out-of-quota MFN imports under the regime in place until the end of 2005? The choice made in this study is partially counterbalanced by the assumption that the EU will choose not to include bananas among its "sensitive" products.

The EU “basic” (or “compensation”) aid for banana producers is modelled as a fully coupled deficiency payment. The per unit payment is calculated as the difference between the given reference price (which does not change over time) and the domestic market price. As long as the domestic market price remains below the reference price, the relevant domestic producer price in the EU (market price + per unit “basic” aid) does not change. As a result, domestic production does not adjust to changes in the EU domestic market (consumer) price; what does change with the latter is the per unit “basic” aid paid to producers and the budgetary cost of the CMO.

The “supplementary aid” is paid in those countries where the price is lower than the average EU price by more than 10% . Two alternative formulas are considered to calculate the per unit “supplementary aid”, which we will refer to as the S*tandard* and the *Madeira* formulas:

$$\textit{Standard}\text{ formula: } 0{,}5 * \frac{0{,}9 * \text{EU average production price} - \text{country average production price}}{0{,}9 * \text{EU average production price} / \text{country average production price}};$$

$$\textit{Madeira}\text{ formula: } 0{,}75 * (\text{EU average production price} - \text{country average production price}) \quad .$$

In the model both “basic” and “supplementary” direct payments are subject to the existing “stabilization” mechanism. If total domestic banana production exceeds the sum of the maximum guaranteed volumes in each of the producing countries (854,000 t in 2007; 867,500 t in 2009 and 2013, when the application of the CMO is extended to Cyprus), then a cut in the volume of bananas on which the payments are made applies in the countries where production has exceeded the maximum guaranteed volume; this cut is adjusted by redistributing *pro rata* among the countries where the cuts apply the difference between maximum guaranteed volume and production in those countries where, on the contrary, this difference is greater than zero. Production decisions are assumed not to react to cuts of the “basic” aid in the previous year, if any, as a result of domestic production exceeding the maximum guaranteed volume on which payments are made. This is because farmers are assumed to act as rational “free riders”, i.e. they believe that the other farmers will reduce their production expecting the same cut to apply in the following year (hence, there is no reason for them to do so, because, if the others reduce production, the aid will not be cut).

Payments are assumed not to be subject to reductions as a result of the “budget discipline” constraint and farms are assumed to satisfy cross-compliance conditions at no extra cost. Modulation does not apply to payments to producers in outermost regions (Canary Islands, Martinique, Guadalupe and Madeira), which account for about 98% of the total, and has been ignored in the simulations.

The results of the simulations for this policy option are presented in Table 3.

Under a continuation of the current policies in 2007 banana consumption in the EU-25 reaches 5,338 million t; domestic production and imports are expected to be 891,1 thousand t and 4,447 million t, respectively. Even if relevant farm prices (market prices + deficiency payment) do not change, domestic production will increase over time because of the increasing yields in Spain, France and Cyprus. It now exceeds the 854,000 t threshold which “triggers” the financial stabilizer mechanism (cuts in aid payments apply both in Spain and France).

Imports from ACP countries equal the duty-free 775,000 t quota; those from MFN countries equal 3,578 million t, those from EBA countries 94,000 t.

Increased imports - driven by the increased competitiveness of MFN exports on the EU market as a result of the new import regime in place since 1 January 2006 – are responsible for most of the reduction in market prices, and, as a result, of the increase in the “basic” aid, which reaches 388.9 €/t . Depending on which of the two formulas is used to calculate the “supplementary” aid, total budget expenditure (i.e. the budget expenditure for “basic” and “supplementary” aid payments) equals 341.6 (“standard” formula) or 359.7 million € (“Madeira” formula), well above CMO budget costs observed in the past.

Tariff revenue, on the contrary, is now much higher than under the previous import regime, when imports from MFN countries were subject to a quota and a lower tariff was imposed; it increases from less than 200 million € before 1 January 2006, to 629,7 .

In 2009 it is assumed that EPA is implemented, which implies quota-free and duty-free imports from ACP countries. If an agreement to conclude the WTO DDA round is not reached, EU imports from ACP countries increase to 964.4 thousand t, while MFN and EBA exports decline as a result of the removal of the quota currently faced on the EU market by ACP exports; the net effect is an increase of EU imports of bananas to 4,568 million t.

Domestic production increases between 2007 and 2009 because of the increasing yields and because the provisions of the CMO are now extended to banana producers in Cyprus, determining almost a doubling of the relevant price at farm level (market price + “basic” aid) in this country. Because of lower market prices, the “basic” aid increases and the budgetary cost of the CMO

Table 3 - Simulation results: the "Status quo" scenario.

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
EU consumption (000 t)	**5338,4**	**5517,6**	**5651,7**	**5681,5**	**5889,4**	**6236,7**	**6316,7**
EU production (000 t)	**891,1**	**949,9**	**949,9**	**949,9**	**1036,1**	**1036,1**	**1036,1**
Spain	*429,1*	*438,2*	*438,2*	*438,2*	*456,9*	*456,9*	*456,9*
France	*418,7*	*445,3*	*445,3*	*445,3*	*503,7*	*503,7*	*503,7*
Portugal	*21,9*	*21,9*	*21,9*	*21,9*	*21,9*	*21,9*	*21,9*
Greece	*2,4*	*2,4*	*2,4*	*2,4*	*2,4*	*2,4*	*2,4*
Cyprus	*19,0*	*42,1*	*42,1*	*42,1*	*51,2*	*51,2*	*51,2*
MFN tariff (Euro/t)	**176,0**	**176,0**	**144,3**	**137,3**	**176,0**	**96,8**	**79,2**
EU imports (000 t)	**4447,1**	**4567,7**	**4701,9**	**4731,7**	**4853,3**	**5200,6**	**5280,6**
from MFN countries	3578,1	3510,8	3772,6	3830,8	3897,8	4502,8	4650,6
from ACP countries	775,0	964,4	849,6	824,0	865,1	639,6	579,0
from EBA countries	94,0	92,5	79,7	76,9	90,4	58,2	51,0
EU border (cif) price (€/t)	**495,8**	**492,5**	**463,9**	**457,6**	**487,7**	**415,5**	**399,6**
Farm income (change with respect to"Status quo" in 2007) (mill €)	--	**18,0**	**15,6**	**15,1**	**38,3**	**26,1**	**23,4**
Spain	--	*1,8*	*1,5*	*1,4*	*5,8*	*3,7*	*3,2*
France	--	*6,0*	*4,5*	*4,2*	*19,6*	*11,8*	*10,0*
Portugal	--	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Greece	--	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Cyprus	--	*10,2*	*9,7*	*9,5*	*13,0*	*10,8*	*10,3*
EU tariff revenue (mill €)	**629,7**	**617,9**	**544,5**	**525,9**	**686,0**	**435,9**	**368,3**

(Table 3 continues on the following page)

(Table 3, continues from the previous page)

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
Basic aid (€/t)	**388,9**	**392,2**	**420,8**	**427,2**	**397,0**	**469,3**	**485,2**
Basic aid, overproduction (000 t)	18,1	82,4	82,4	82,4	168,6	168,6	168,6
Basic aid budget expenditure	**332,1**	**340,2**	**365,1**	**370,6**	**344,4**	**407,1**	**420,9**
Spain	*165,8*	*167,1*	*179,3*	*182,0*	*169,6*	*200,5*	207,3
France	*156,9*	*154,6*	*165,9*	*168,4*	*156,9*	*185,5*	*191,7*
Portugal	*8,5*	*8,6*	*9,2*	*9,4*	*8,7*	*10,3*	*10,6*
Greece	*0,9*	*0,9*	*1,0*	*1,0*	*0,9*	*1,1*	*1,2*
Cyprus	--	*9,0*	*9,7*	*9,8*	*8,3*	*9,8*	*10,1*
Supplementary aid budget expenditure (standard formula) (mill €)	**9,4**	**9,5**	**9,1**	**9,0**	**9,5**	**8,0**	**7,2**
Spain							
France	*9,4*	*9,5*	*9,1*	*9,0*	*9,5*	*8,0*	*7,2*
Portugal			*0,0*	*0,0*		*0,0*	*0,0*
Greece							
Cyprus							
EU CMO budget expenditure	**341,6**	**349,7**	**374,2**	**379,6**	**353,9**	**415,1**	**428,1**
Supplementary aid budget expenditure (Madeira formula) (mill €)	**27,5**	**27,7**	**28,1**	**28,1**	**27,9**	**28,2**	**28,2**
Spain							
France	*27,5*	*27,7*	*27,7*	*27,7*	*27,9*	*27,9*	*27,9*
Portugal			*0,4*	*0,4*		*0,3*	*0,3*
Greece							
Cyprus							
EU CMO budget expenditure	**359,7**	**367,9**	**393,1**	**398,6**	**372,3**	**435,3**	**449,1**

expands to 349.7 or 367.9 million €, depending on which of the two options is used to calculate the "supplementary" aid.

As the sum of market price and "basic" aid does not change, incomes increase with respect to 2007 in those countries where supply shifts as a result of improved production practices (France, Spain and Cyprus).[8] The marked increase in farm incomes in Cyprus is largely the result of the extension of the CMO to this country in 2009.

If it is assumed that 2009 is year two of the implementation period of the DDA round agreement, the MFN tariff is reduced from its current value of 176 €/t to either 144.3 €/t (if an overall reduction by 45% applies) or to 137.3 €/t (if the reduction equals 55% instead). This means expanded market access and increased competitiveness of MFN exports on the EU market *vis a vis* those of ACP and EBA countries, which suffer from the erosion of their preferential margin; EU imports increase, while those from ACP and EBA countries decline with respect to the scenario in which the MFN tariff is left unchanged.

Increased imports drive the market price in the EU down; domestic production does not change, due to the deficiency payment "basic" aid, but the CMO budget expenditure increases as a result of the increase in the "basic" aid from 392.2 €/t (no DDA) to 420.8 €/t (DDA EU) or to 427.2 €/t (DDA G-20). Despite increased imports from MFN countries, EU tariff revenue declines with the lowering of the MFN tariff.

Farm incomes are only partially effected by the outcome of the DDA. Although the decline in market prices is fully compensated by the increase of the "basic" aid by the same amount, farm incomes in Cyprus, France and Spain decrease when increased market access lowers domestic prices; this is because of the losses they incur on that portion of production above the maximum guaranteed quantity on which the "basic" aid is not paid due to the stabilization mechanism (this portion of the "overproduction" is sold at a price below marginal cost).

Results for 2013 are of the same qualitative nature, only larger in size.

If, for example, no DDA agreement is reached, EU consumption continues to increase, reaching almost 5.9 million t. MFN bananas see their market competitiveness increase with respect to both ACP and EBA countries (this is a result of the differences in the export supply function shifts in the latter). EU production increases to 1,036 million t, as farmers in those countries where

[8] Changes in farm incomes are given by changes in aggregate producer surplus (by definition, producer surplus equals farm income plus fixed production costs; fixed production costs being unknown, by calculating the differences with respect to one of the scenarios it becomes possible to assess income changes). Because of the simplified nature of the supply functions used in the model, these estimates should be considered with caution; they are only provided to give an indication of the direction and order of magnitude of the expected changes in farm incomes under the different policy options considered.

production costs decline, relevant farm level prices remaining unchanged, find it profitable to produce more. Technical improvements are behind the increase of farm incomes by 38.3 million € with respect to those in 2007. The budgetary cost of the CMO reaches 353.9 or 372.3 million €, depending on how the "supplementary" aid is calculated.

3.2 "Decoupling"

Under this scenario current "basic" and "supplementary" aid payments are removed and replaced by direct payments to farms fully "decoupled" from the quantity of bananas produced, analogously to those introduced in other sectors with the Fischler reforms of the Common Agricultural Policy.

The total amount of decoupled payments in France, Greece, Portugal and Spain is given by the average CMO disbursements ("basic" + "supplementary" aid payments) in the three year period 2000-2002 (258.029 million €). In each country decoupled payments are obtained by applying the percent distribution of payments by country in 2000 to this amount. This yields the following budget expenditures for decoupled payments: 118.9 million € in France, 1.1 in Greece, 7.9 in Portugal and 130.1 in Spain. Decoupled payments in Cyprus in 2009 and 2013 are assumed to equal € 3,070,000 .

Costs to maintain uncultivated land in good agronomical conditions or to satisfy "cross-compliance" requirements are assumed to be negligible.

The results of the simulations for this policy option are presented in Table 4.

Everything else held constant, the decoupling of support is expected to induce a sharp reduction in banana production in the EU and an increase in farm incomes. This is so because farmers receive as decoupled payments the same transfers they received under "basic" and "supplementary" aid payments, but now they produce only what is profitable at market prices; this means their incomes increase by a portion of the "losses" they incur under the "Status quo" regime to produce bananas which are sold on the market at a price below the marginal cost of production.

In 2007 EU production is forecasted to equal 340.5 thousand t (in the same year under the "Status quo" option it is forecasted to be 891.1 thousand t). Farm incomes increase in all countries;[9] overall the increase is by 64.2 million €, with the largest gains in the two largest producers, Spain and France. In assessing these gains one should keep in mind that increases in farm incomes are greater than the associated changes in country GDPs; this is because at least part of the reduction in production costs from the contraction in banana production is associated to domestically produced inputs, including hired labour.

[9] In Cyprus incomes increase because of the increased market price.

Table 4 - Simulation results: the "Decoupling" scenario.

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
EU consumption (000 t)	**5310,7**	**5487,9**	**5620,0**	**5649,3**	**5855,2**	**6196,4**	**6275,0**
EU production (000 t)	**340,5**	**351,2**	**308,7**	**299,2**	**377,3**	**260,5**	**234,6**
Spain	*151,3*	*152,6*	*135,5*	*131,7*	*156,4*	*111,3*	*101,4*
France	*160,4*	*168,1*	*145,3*	*140,3*	*186,3*	*121,1*	*106,8*
Portugal	*8,4*	*8,3*	*7,3*	*7,0*	*8,1*	*5,6*	*5,0*
Greece	*0,8*	*0,8*	*0,7*	*0,7*	*0,8*	*0,6*	*0,5*
Cyprus	*19,6*	*21,4*	*19,9*	*19,5*	*25,7*	*21,9*	*20,9*
MFN tariff (Euro/t)	**176,0**	**176,0**	**144,3**	**137,3**	**176,0**	**96,8**	**79,2**
EU imports (000 t)	**4970,3**	**5136,8**	**5311,3**	**5350,1**	**5477,9**	**5935,9**	**6040,4**
from MFN countries	4098,6	4051,5	4351,8	4418,5	4493,5	5204,0	5375,2
from ACP countries	775,0	989,9	876,8	851,7	891,0	670,1	610,5
from EBA countries	96,7	95,4	82,7	79,9	93,4	61,8	54,7
EU border (cif) price (€/t)	**501,9**	**498,9**	**470,7**	**464,4**	**494,6**	**423,5**	**407,8**
Decoupled payments (mill €)	**258,0**	**261,1**	**261,1**	**261,1**	**261,1**	**261,1**	**261,1**
Spain	*130,1*	*130,1*	*130,1*	*130,1*	*130,1*	*130,1*	*130,1*
France	*118,9*	*118,9*	*118,9*	*118,9*	*118,9*	*118,9*	*118,9*
Portugal	*7,9*	*7,9*	*7,9*	*7,9*	*7,9*	*7,9*	*7,9*
Greece	*1,1*	*1,1*	*1,1*	*1,1*	*1,1*	*1,1*	*1,1*
Cyprus		*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*
Farm income (change with respect to"Status quo" in 2007) (mill €)	**64,2**	**68,1**	**58,8**	**56,9**	**70,4**	**48,1**	**44,2**
Spain	*31,0*	*31,0*	*26,9*	*26,1*	*31,1*	*21,6*	*19,9*
France	*29,5*	*30,0*	*25,6*	*24,7*	*31,5*	*20,6*	*18,8*
Portugal	*3,1*	*3,1*	*2,9*	*2,9*	*3,1*	*2,6*	*2,5*
Greece	*0,5*	*0,5*	*0,5*	*0,4*	*0,5*	*0,4*	*0,4*
Cyprus	*0,1*	*3,5*	*2,9*	*2,8*	*4,2*	*2,9*	*2,6*
EU tariff revenue (mill €)	**721,4**	**713,1**	**628,0**	**606,6**	**790,8**	**503,8**	**425,7**

EU banana consumption is slightly below the level under the “Status quo” option. MFN and EBA countries benefit from the reduction in domestic supply and increase their exports; in 2007 ACP exports to the EU are still constrained by the duty-free quota.

Budget expenditure equals 258 million €, well below that expected under the “Status quo” scenario; tariff revenue is higher, due to increased imports from MFN countries.

In 2009 and 2013, under the “NO DDA” assumption market prices decline, as a result of increased imports from ACP countries, which are no longer constrained by the quota, and productivity increases in several exporting countries. EU production increases to 351.2 and 377.3 thousand t, respectively; this is the net result of production increases in Cyprus, France and Spain, despite the lower prices, and reduced production in Greece and Portugal.

Increased imports from ACP countries in 2009 occur at the expense of imports from MFN and EBA countries (the net effect being an increase in EU imports); stronger (in relative terms) productivity gains in MFN countries lead to an increase of their exports to the EU in 2013, while ACP and EBA exports decline.

Decoupled payments increase in 2009 and 2013 only by the amount of the payments now made in Cyprus. Because of lower market prices, farm incomes in Greece and Portugal decline slightly with respect to those in 2007, while, despite the price reduction, they increase slightly in France and Spain; farm incomes increase significantly in Cyprus due to the introduction of the decoupled payments. Overall, under the “NO DDA” assumption farm incomes in the EU in 2009 and 2013 are higher than under the “Status quo” option by 50.1 and 32.1 million €, respectively.

If the MFN import tariff is reduced as a result of the conclusion of the WTO DDA round, EU imports and consumption increase, while domestic production, market prices and farm incomes decline.

3.3 “Memorandum”

This policy option is based on the joint proposal put forward by Cyprus, France, Portugal and Spain and described in the Memorandum the Ministers of Agriculture of these countries signed in Madeira in September 2005.

Under this scenario the current “basic” and “supplementary” aid payments are removed and replaced by different policy schemes in each country, within given financial envelopes.

In the 2005 Memorandum total budget expenditure is suggested to equal the highest yearly CMO budget expenditure in the 2000-2004 period (i.e. 302 million €, the expenditure in 2000). In this study simulations have been obtained for this overall budget expenditure in EU-15, as well as

for two additional amounts: 258 million € (the rounded average budget expenditure in the 2000-2002 period[10]) and 232 million € (the rounded average yearly budget expenditure in the 2001-2005 period without taking into account the highest and the lowest yearly expenditures). In all three cases, country envelopes for France, Greece, Portugal and Spain are obtained by applying the percent country distribution of the expenditure observed in year 2000; the envelope for Cyprus in 2009 and 2013 is assumed to be € 3,070,000 . The budget envelopes are given in the table below:

France	107,0	118,9	139,2
Greece	0,9	1,0	1,2
Portugal	7,2	8,0	9,4
Spain	116,9	130,0	152,2
Total EU-15	**232,0**	**258,0**	**302,0**
Cyprus*	3,1	3,1	3,1
Total EU-25	**235,1**	**261,1**	**302,0**

*: in 2009 and 2013 only.

As regards these financial envelopes, different policy instruments are applied in the different countries. These are modelled as follows:

(a) in France and Spain 60% of the envelope is devoted to decoupled payments. In order to receive their full entitlement of decoupled payments, farms have to produce at least 70% of what they produced, on average, in the 2000-2004 period. It turns out that the financial incentive is large enough to ensure that farms find it profitable in all simulations to produce at least the minimum volume of bananas needed for them to claim the full decoupled payments they are eligible for; depending on the assumption regarding the overall budget expenditure, decoupled payments in France are between 6,550 and 8,500 €/ha, in Spain between 7,300 and 9,500 €/ha. In the 2005 Memorandum the remaining 40% of the envelope has been proposed to be devoted:

(i) to an additional 30 €/t specific (coupled) payment to open air banana producers in the Canary Islands and to banana producers in mountain areas in Guadalupe and Martinique;

(ii) to increase decoupled payments to banana producers;

(iii) to support start-up activities of new farmers and the enlargement of existing farms.

[10] There are minor differences in the budget expenditures compared with those under the “Decoupling” scenario, where the total budgetary cost is equal to the average in the 2000-2002 period, without rounding up.

The impact on the banana market of the use of the 40% of the envelope has been ignored in the modelling. Financial resources used to increase decoupled payments uniformly will effect farm incomes, but will have no direct effect on market equilibrium. Those used to finance coupled payments for banana producers facing specific disadvantageous production conditions will increase the profitability of banana production under these conditions; the structure of the model, however, does not allow us to simulate the extent of these effects. For the same reason the simulations ignore the effects of the financial resources employed to support new farmers and the enlargement of existing farms.

(b) in Portugal 100% of the envelope is devoted to the introduction of a fully coupled production subsidy. The per unit aid is given by the envelope divided by the average yearly production in 2000-2004; depending on the assumption with respect to the total budget expenditure, this yields a subsidy equal to 334.2 , 371.7 or 435.1 €/t. The subsidy expenditure cannot exceed Portugal's financial envelope; if production is such that expenditure would exceed the envelope, the eligible volume is cut *pro rata* so that the expenditure equals the envelope.

(c) in Greece and Cyprus (for the latter in 2009 and 2013 only) 100% of the envelope goes into fully decoupled farm payments, identical to those assumed in the "Decoupling" scenario.

The results of the simulations under the three assumptions with respect to the overall budgetary cost of the CMO in the EU-15 are presented in Table 5 (302 million €), Table 6 (258 million €) and Table 7 (232 million €).

The market impact of the "Memorandum" option under the three budgetary costs considered is very similar; in fact, in France and Spain production does not change; in Cyprus (in 2009 and 2013) and in Greece support is decoupled, hence, production decisions are not effected by the amount of the decoupled payments; and in Portugal, where support is coupled and the per unit aid changes with the envelope, is too small as a banana producer to significantly effect market equilibrium. What is definitely different under the three levels of budget expenditure is the impact of the "Memorandum" option on farm incomes.

If we compare the expected impact of this policy option with that of "Decoupling" under the same budget expenditure (i.e. 258 million € in 2007, 261.1 in 2009 and 2013) (Tables 4 and 6), the "Memorandum" option yields higher domestic production and lower imports, from all three groups

Table 5 - Simulation results: the "Memorandum" scenario (budget expenditure equal to 232 million Euro).

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
EU consumption (000 t)	**5321,8**	**5498,5**	**5632,5**	**5662,1**	**5865,0**	**6211,9**	**6291,9**
EU production (000 t)	**561,1**	**562,9**	**560,2**	**559,7**	**567,1**	**560,3**	**558,7**
Spain	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*
France	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*
Portugal	*20,1*	*20,0*	*19,0*	*18,8*	*19,9*	*17,3*	*16,8*
Greece	*0,8*	*0,8*	*0,7*	*0,7*	*0,8*	*0,5*	*0,5*
Cyprus	*19,4*	*21,3*	*19,7*	*19,4*	*25,6*	*21,7*	*20,6*
MFN tariff (Euro/t)	**176,0**	**176,0**	**144,3**	**137,3**	**176,0**	**96,8**	**79,2**
EU imports (000 t)	**4760,6**	**4935,5**	**5072,2**	**5102,5**	**5297,8**	**5651,6**	**5733,1**
from MFN countries	3890,0	3860,3	4124,7	4183,1	4321,8	4932,9	5082,1
from ACP countries	775,0	980,9	866,0	840,7	883,5	658,3	597,8
from EBA countries	95,6	94,3	81,5	78,7	92,5	60,4	53,2
EU border (cif) price (€/t)	**499,5**	**496,6**	**468,0**	**461,7**	**492,6**	**420,4**	**404,5**
Total budget expenditure (mill €)	**232,0**	**235,1**	**235,1**	**235,1**	**235,1**	**235,1**	**235,1**
Country envelopes (mill €)							
Spain	*116,9*	*116,9*	*116,9*	*116,9*	*116,9*	*116,9*	*116,9*
France	*107,0*	*107,0*	*107,0*	*107,0*	*107,0*	*107,0*	*107,0*
Portugal	*7,2*	*7,2*	*7,2*	*7,2*	*7,2*	*7,2*	*7,2*
Greece	*0,9*	*0,9*	*0,9*	*0,9*	*0,9*	*0,9*	*0,9*
Cyprus	*0,0*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*
Decoupled payments (mill €)							
Spain	*70,2*	*70,2*	*70,2*	*70,2*	*70,2*	*70,2*	*70,2*
France	*64,2*	*64,2*	*64,2*	*64,2*	*64,2*	*64,2*	*64,2*
Portugal	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Greece	*0,9*	*0,9*	*0,9*	*0,9*	*0,9*	*0,9*	*0,9*
Cyprus	*0,0*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*

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	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
Production subsidy in Portugal (€/t)	334,2	334,2	334,2	334,2	334,2	334,2	334,2
Subsidy expenditure in Portugal (mill €)	6,7	6,7	6,4	6,3	6,6	5,8	5,6
Farm income (change with respect to"Status quo" in 2007) (mill €)	**-74,1**	**-68,6**	**-84,6**	**-88,2**	**-63,3**	**-103,8**	**-112,6**
Spain	*-44,9*	*-44,3*	*-52,5*	*-54,3*	*-42,7*	*-63,4*	*-68,0*
France	*-29,4*	*-27,9*	*-34,6*	*-36,1*	*-24,9*	*-41,9*	*-45,6*
Portugal	*-0,1*	*-0,1*	*-0,7*	*-0,8*	*-0,2*	*-1,6*	*-1,8*
Greece	*0,3*	*0,3*	*0,3*	*0,3*	*0,3*	*0,3*	*0,3*
Cyprus	*0,0*	*3,4*	*2,9*	*2,7*	*4,2*	*2,8*	*2,5*
EU tariff revenue (mill €)	**684,6**	**679,4**	**595,2**	**574,3**	**760,6**	**477,5**	**402,5**

Table 6 - Simulation results: the "Memorandum" scenario (budget expenditure equal to 258 million €).

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
EU consumption (000 t)	**5321,9**	**5498,5**	**5632,6**	**5662,2**	**5865,1**	**6212,0**	**6292,0**
EU production (000 t)	**562,5**	**564,3**	**561,5**	**561,0**	**568,4**	**561,7**	**560,0**
Spain	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*
France	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*
Portugal	*21,5*	*21,4*	*20,3*	*20,1*	*21,2*	*18,7*	*18,1*
Greece	*0,8*	*0,8*	*0,7*	*0,7*	*0,8*	*0,5*	*0,5*
Cyprus	*19,4*	*21,3*	*19,7*	*19,4*	*25,6*	*21,7*	*20,6*
MFN tariff (Euro/t)	**176,0**	**176,0**	**144,3**	**137,3**	**176,0**	**96,8**	**79,2**
EU imports (000 t)	**4759,4**	**4934,2**	**5071,0**	**5101,2**	**5296,6**	**5650,3**	**5731,8**
from MFN countries	3888,8	3859,1	4123,5	4181,9	4320,6	4931,7	5080,9
from ACP countries	775,0	980,8	866,0	840,6	883,5	658,2	597,7
from EBA countries	95,6	94,3	81,5	78,7	92,5	60,4	53,2
EU border (cif) price (€/t)	**499,4**	**496,6**	**468,0**	**461,7**	**492,6**	**420,4**	**404,5**
Total budget expenditure (mill €)	**258,0**	**261,1**	**261,1**	**261,1**	**261,1**	**261,1**	**261,1**
Country envelopes (mill €)							
Spain	*130,0*	*130,0*	*130,0*	*130,0*	*130,0*	*130,0*	*130,0*
France	*118,9*	*118,9*	*118,9*	*118,9*	*118,9*	*118,9*	*118,9*
Portugal	*8,0*	*8,0*	*8,0*	*8,0*	*8,0*	*8,0*	*8,0*
Greece	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*
Cyprus	*0,0*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*
Decoupled payments (mill €)							
Spain	*78,0*	*78,0*	*78,0*	*78,0*	*78,0*	*78,0*	*78,0*
France	*71,4*	*71,4*	*71,4*	*71,4*	*71,4*	*71,4*	*71,4*
Portugal	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Greece	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*
Cyprus	*0,0*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*

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	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
Production subsidy in Portugal (€/t)	371,7	371,7	371,7	371,7	371,7	371,7	371,7
Subsidy expenditure in Portugal (mill €)	8,0	7,9	7,6	7,5	7,9	6,9	6,7
Farm income (change with respect to"Status quo" in 2007) (mill €)	**-58,2**	**-52,8**	**-68,8**	**-76,4**	**-47,4**	**-88,0**	**-96,8**
Spain	*-37,1*	*-36,5*	*-44,7*	*-46,5*	*-34,9*	*-55,6*	*-60,1*
France	*-22,2*	*-20,7*	*-27,4*	*-32,9*	*-17,7*	*-34,7*	*-38,4*
Portugal	*0,7*	*0,6*	*0,0*	*-0,1*	*0,6*	*-0,9*	*-1,2*
Greece	*0,4*	*0,4*	*0,4*	*0,4*	*0,4*	*0,4*	*0,4*
Cyprus	*0,0*	*3,4*	*2,9*	*2,7*	*4,2*	*2,8*	*2,5*
EU tariff revenue (mill €)	**684,4**	**679,2**	**595,0**	**574,2**	**760,4**	**477,4**	**402,4**

Table 7 - Simulation results: the "Memorandum" scenario (budget expenditure equal to 302 million Euro).

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
EU consumption (000 t)	**5322,0**	**5498,6**	**5632,7**	**5662,3**	**5865,2**	**6212,1**	**6292,1**
EU production (000 t)	**564,4**	**566,2**	**563,9**	**563,4**	**570,4**	**563,9**	**562,2**
Spain	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*	*286,3*
France	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*	*234,5*
Portugal	*23,4*	*23,3*	*22,7*	*22,5*	*23,2*	*20,9*	*20,3*
Greece	*0,8*	*0,8*	*0,7*	*0,7*	*0,8*	*0,5*	*0,5*
Cyprus	*19,4*	*21,3*	*19,7*	*19,4*	*25,6*	*21,7*	*20,6*
MFN tariff (Euro/t)	**176,0**	**176,0**	**144,3**	**137,3**	**176,0**	**96,8**	**79,2**
EU imports (000 t)	**4757,6**	**4932,4**	**5068,8**	**5098,9**	**5294,8**	**5648,1**	**5729,7**
from MFN countries	3887,0	3857,4	4121,4	4179,7	4318,9	4929,7	5078,9
from ACP countries	775,0	980,7	865,9	840,5	883,4	658,1	597,6
from EBA countries	95,6	94,3	81,5	78,7	92,5	60,3	53,2
EU border (cif) price (€/t)	**499,4**	**496,6**	**468,0**	**461,7**	**492,6**	**420,3**	**404,4**
Total budget expenditure (mill €)	**302,0**	**305,1**	**305,1**	**305,1**	**305,1**	**305,1**	**305,1**
Country envelopes (mill €)							
Spain	*152,2*	*152,2*	*152,2*	*152,2*	*152,2*	*152,2*	*152,2*
France	*139,2*	*139,2*	*139,2*	*139,2*	*139,2*	*139,2*	*139,2*
Portugal	*9,4*	*9,4*	*9,4*	*9,4*	*9,4*	*9,4*	*9,4*
Greece	*1,2*	*1,2*	*1,2*	*1,2*	*1,2*	*1,2*	*1,2*
Cyprus	*0,0*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*
Decoupled payments (mill €)							
Spain	*91,3*	*91,3*	*91,3*	*91,3*	*91,3*	*91,3*	*91,3*
France	*83,5*	*83,5*	*83,5*	*83,5*	*83,5*	*83,5*	*83,5*
Portugal	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*	*0,0*
Greece	*1,2*	*1,2*	*1,2*	*1,2*	*1,2*	*1,2*	*1,2*
Cyprus	*0,0*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*	*3,1*

(Table 7 continues on the following page)

(Table 7, continues from the previous page)

	2007	2009			2013		
		NO DDA	DDA EU	DDA G-20	NO DDA	DDA EU	DDA G-20
Production subsidy in Portugal (€/t)	400,8	401,9	413,0	415,5	403,4	435,1	435,1
Subsidy expenditure in Portugal (mill €)	9,4	9,4	9,4	9,4	9,4	9,1	8,8
Farm income (change with respect to"Status quo" in 2007) (mill €)	**-31,3**	**-25,9**	**-41,7**	**-45,3**	**-20,6**	**-61,0**	**-70,0**
Spain	*-23,8*	*-23,2*	*-31,4*	*-33,2*	*-21,6*	*-42,3*	*-46,8*
France	*-10,0*	*-8,6*	*-15,3*	*-16,8*	*-5,6*	*-22,5*	*-26,2*
Portugal	*1,9*	*1,9*	*1,5*	*1,4*	*1,8*	*0,4*	*0,0*
Greece	*0,6*	*0,6*	*0,6*	*0,6*	*0,6*	*0,6*	*0,5*
Cyprus	*0,0*	*3,4*	*2,9*	*2,7*	*4,2*	*2,8*	*2,5*
EU tariff revenue (mill €)	**684,1**	**678,9**	**594,7**	**573,9**	**760,1**	**477,2**	**402,2**

of countries;[11] prices in the EU are slightly lower and consumption higher.

Domestic production is higher under the "Memorandum" scenario in France, Portugal and Spain, lower in Greece and Cyprus. In France and Spain banana production equals the minimum threshold required to receive the full amount of decoupled payments (234.5 and 286.3 thousand t, respectively, vs. 160.4 and 151.3 thousand t produced when farms, under the "Decoupling" option, are free to produce what they find profitable at market prices). In Portugal, where support is now fully coupled, production reaches 21.5 thousand t (it is forecasted to equal 8.4 thousand t when the support is decoupled). In Greece (and Cyprus in 2007), although the policy environment is the same under the two scenarios (decoupled payments in Greece; no specific policy support for banana producers in Cyprus in 2007), production declines slightly[12] because higher production in the other countries leads to lower domestic prices.

Under the "Memorandum" option, while production in France and Spain does not react to changes over time in market conditions from both, shifts in supply and demand functions and possible developments in the DDA round, production in Cyprus, Greece and Portugal is effected. Production in Cyprus increases with time (because of the expected relatively strong increases in yields) and declines as the EU market becomes more open; production in Greece and Portugal decreases with time (because of their lower relative cost competitiveness over time) and as EU market openness increases.

The lower the MFN tariff, the larger EU imports from MFN countries, the smaller those from ACP and EBA countries. Ceteris paribus, MFN exports increase and ACP and EBA exports decline over time; this is the result of the relative magnitude of the expected shifts in the excess supply functions in these groups of countries.

Caution is needed when the figures in Tables 5 to 7 are used to assess the impact of this policy option on farm incomes. In fact, while for Cyprus, Greece and Portugal the estimated income changes are derived by taking into account fully the policy instruments in place, for France and Spain only the impact of the 60% of the financial envelope committed to financing decoupled payments is considered; the 40% of the envelopes in these two countries equal 52 and 47.5 million €, respectively.

To have a term of reference for what may happen once the impact of the use of the remaining 40% of the envelope is taken into account, we can assume that France and Spain decide to devote the entire 40% of their envelopes to increasing decoupled payments to farms uniformly. If this is the

[11] In 2007 EU imports from ACP countries are the same under the two options, as they equal the duty-free import quota.
[12] In most cases these reductions are too small to show in the rounded figures provided in Tables 4 and 6.

case, farm incomes in 2007 under the “Memorandum” option are higher than those under the “Status quo” by 14.9 million € in Spain (-37.1 + 52 million €) and by 25.3 million € in France (-22.2 + 47.5). This implies that when the entire envelope in Spain and France is devoted to decoupled payments, farm incomes are lower than under the “Decoupling” option; decoupled payments would be the same under the two options, but under the “Memorandum” farms, in order to have access to the decoupled payments, have to produce more than is profitable under market conditions, and this leads to lower incomes. Farm incomes in France and Spain decline with market prices; this is because, when market prices decline, it becomes more and more “costly” for farmers to satisfy the production constraint in order to receive the full amount of decoupled payments.

Finally, when the total budgetary cost for the CMO in the EU-15 equals 232 and 258 million € the budget expenditure in Portugal remains below the amount of its envelope; however, when it equals 302 million € the financial stabilizer in the policy scheme comes into action in all but the two simulations yielding the lowest domestic prices.

3.4 “Full liberalization”

In this scenario the removal of all domestic and trade policies is assumed. In all countries no domestic policy intervention takes place and imports from all origins enter duty- and quota-free. For the modelling of the EU this means no domestic policy intervention whatsoever, the removal of the MFN tariff and, for 2007, the removal of the duty-free import quota reserved to imports from ACP countries; for the other countries it implies the removal of the few existing import tariffs.

It is worth reiterating that full liberalization of domestic policies is definitely not an option for the reform of the CMO for bananas; it is offered only as a reference scenario which may help the reader obtain a clearer assessment of the results of the simulations obtained for the three policy options considered.

The results of the simulations are presented in Table 8.

To facilitate the comparison of the main results of the simulations for the six policy scenarios which have been simulated – “Status quo”, “Decoupling”, “Memorandum”, with three different levels of budget expenditure, and “Full liberalization” – Figures 6-17 present those obtained for 2007 and for 2013 assuming a 55% cut in the MFN tariff (the “DDA G-20” assumption).

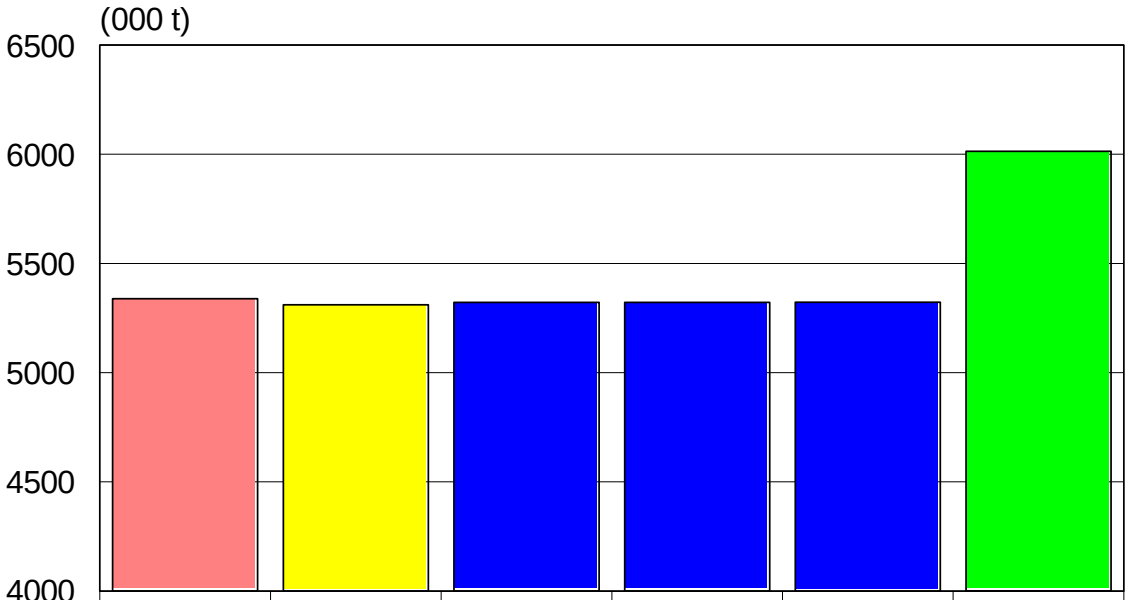
If “Full liberalization” is assumed, domestic production in 2007 equals 111.8 thousand t only; it increases, albeit slightly, in 2009 and 2013.

Domestic prices in the EU in 2007 are forecasted to be 152.2 €/t lower than under the current domestic and trade policy regimes (“Status quo”). If those in 2009 and 2013 are compared to those

Table 8 - Simulation results: the "Full liberalization" scenario.

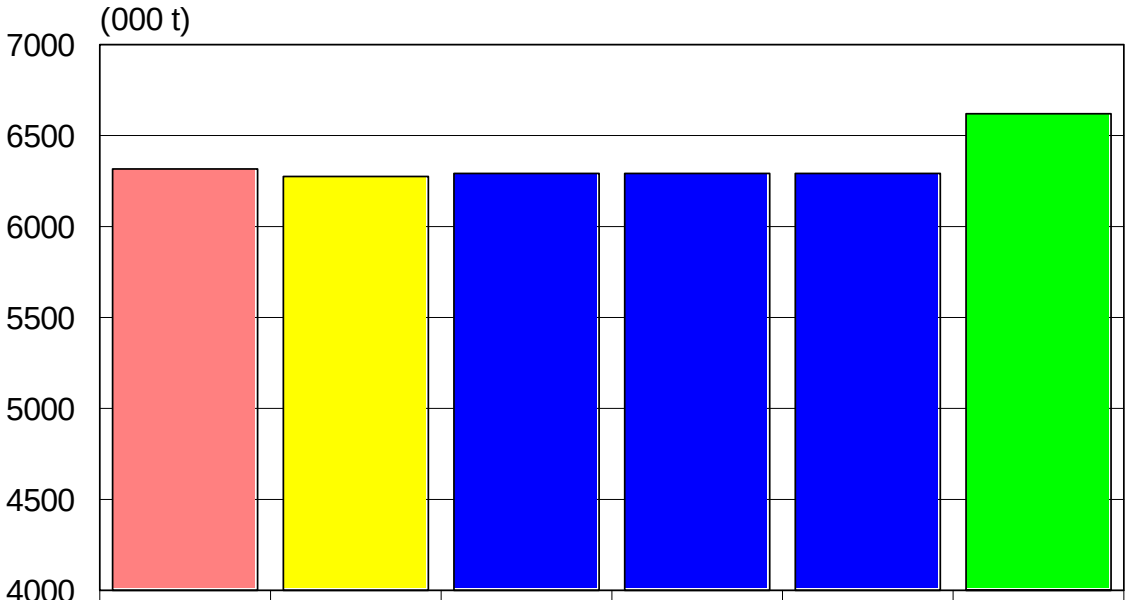
	2007	2009	2013
EU consumption (000 t)	**6013,5**	**6202,8**	**6620,1**
EU production (000 t)	**111,8**	**116,3**	**120,5**
Spain	*57,0*	*58,0*	*57,8*
France	*39,8*	*42,1*	*43,7*
Portugal	*2,8*	*2,8*	*2,6*
Greece	*0,3*	*0,3*	*0,3*
Cyprus	*11,9*	*13,1*	*16,1*
EU imports (000 t)	**5901,7**	**6086,6**	**6499,6**
from MFN countries	5637,5	5855,4	6216,5
from ACP countries	264,2	231,2	283,1
from EBA countries	0,0	0,0	0,0
Total MFN exports	12849,0	12930,9	13147,8
Total ACP exports	449,8	425,3	358,7
Total EBA exports	58,5	58,4	54,5
EU border (cif) price (€/t)	**343,6**	**343,3**	**339,0**
Farm income (change with respect to"Status quo" in 2007) (mill €)	**-229,5**	**-229,2**	**-229,2**
Spain	*-115,6*	*-115,5*	*-115,7*
France	*-105,3*	*-105,2*	*-105,3*
Portugal	*-5,7*	*-5,7*	*-5,7*
Greece	*-0,7*	*-0,7*	*-0,7*
Cyprus	*-2,2*	*-2,1*	*-1,8*

Figure 6 - Simulation results (2007)
EU consumption under the policy options considered



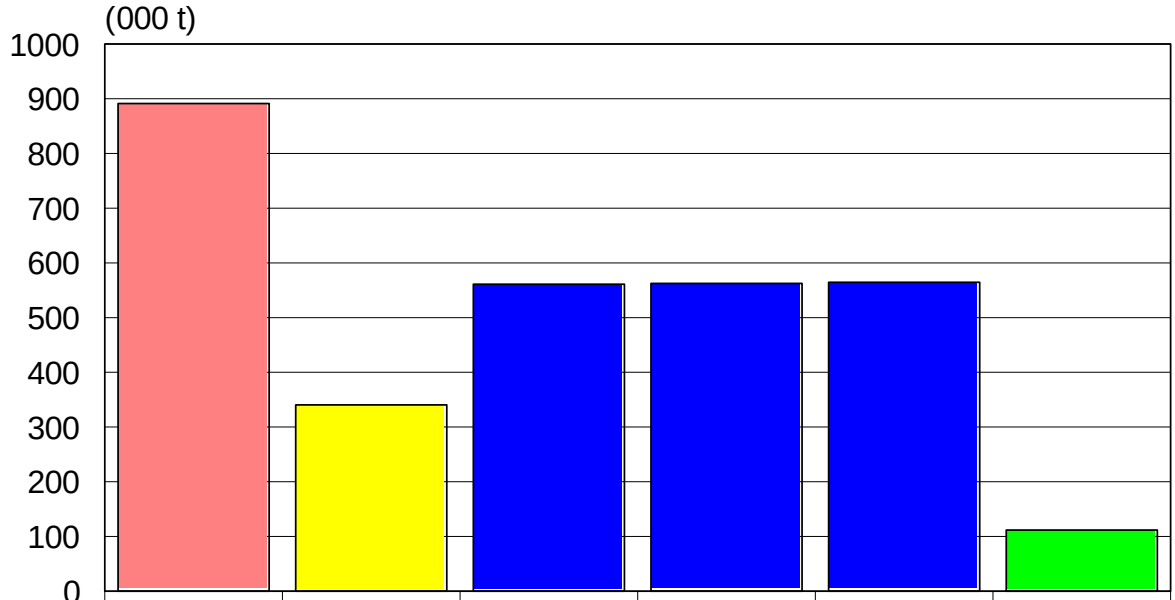
	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Consumption	5338,4	5310,7	5321,8	5321,9	5322	6013,5

Figure 7 - Simulation results (2013; DDA G-20)
EU consumption under the policy options considered



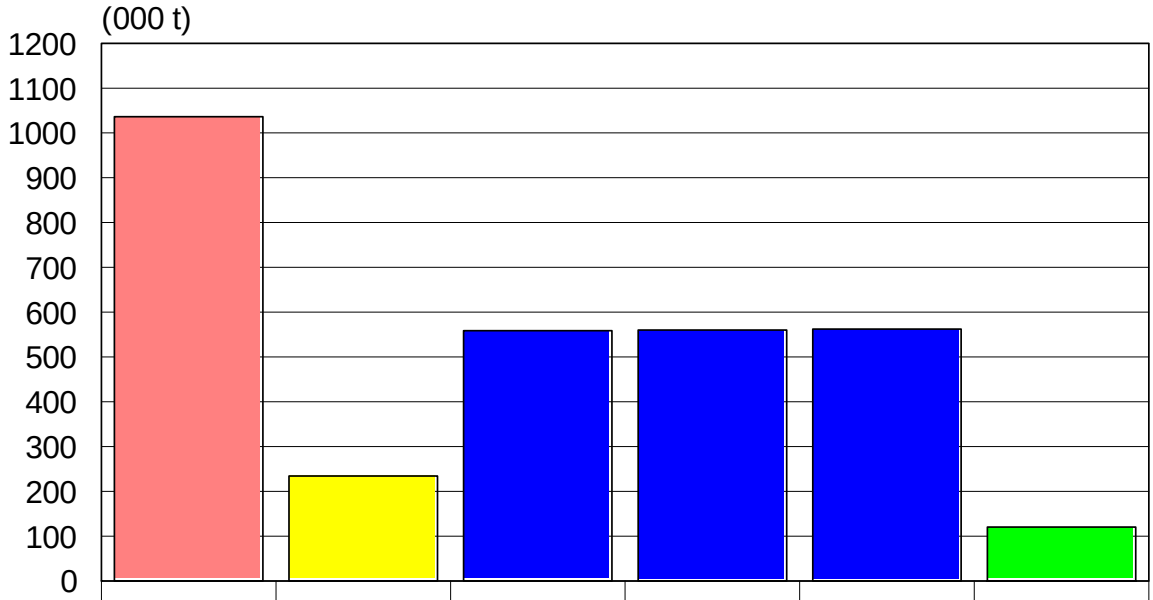
	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Consumption	6316,7	6275	6291,9	6292	6292,1	6620,1

Figure 8 - Simulation results (2007)
EU production under the policy options considered.



	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Production	891,1	340,5	561,1	562,5	564,4	111,8

Figure 9 - Simulation results (2013; DDA G-20)
EU production under the policy options considered.



	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Production	1036,1	234,6	558,7	560	562,2	120,5

Figure 10 - Simulation results (2007)
EU imports under the policy options considered.

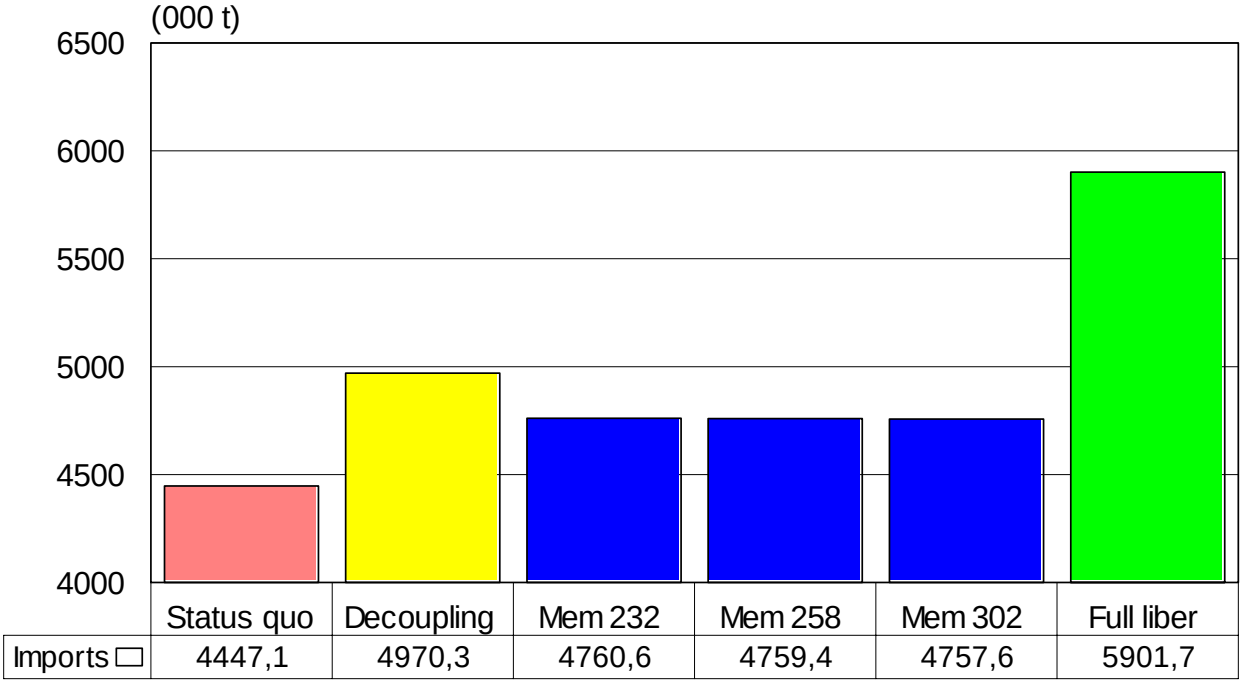


Figure 11 - Simulation results (2013; DDA G-20)
EU imports under the policy options considered.

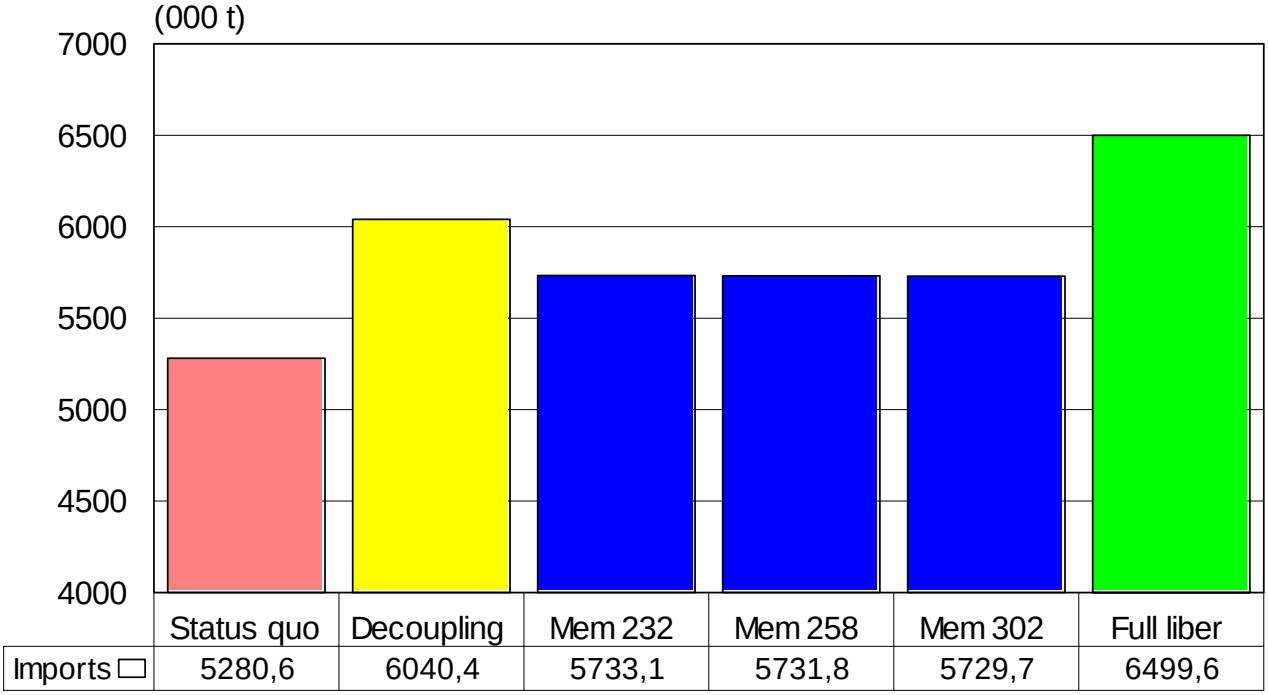
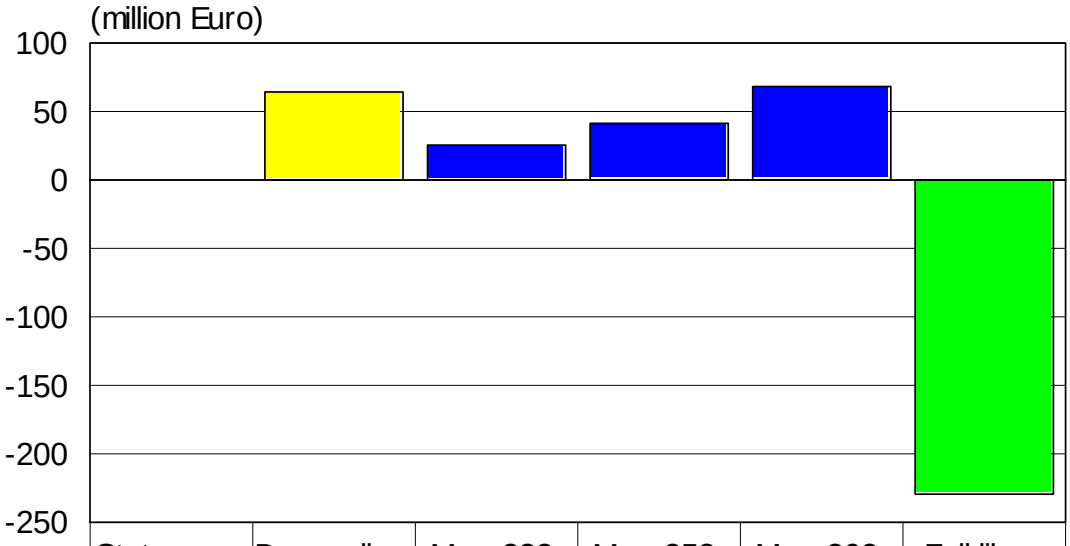


Figure 12 - Simulation results (2007)

EU farm income changes with respect to "Status quo" under the policy options considered.

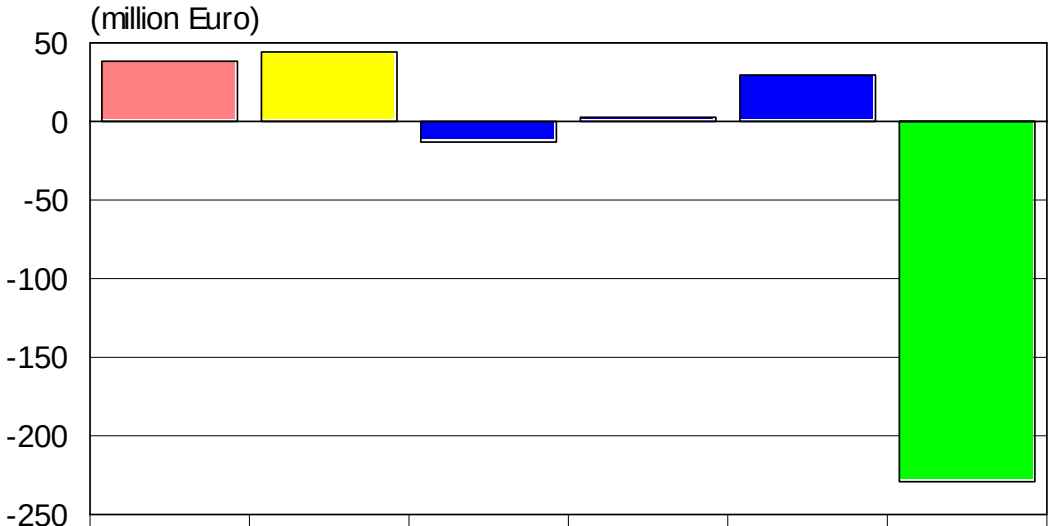


	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Incomes change		64,2	25,4	41,3	68,2	-229,5

Note: In the "Memorandum" scenarios it is assumed that in France and Spain 100% of the finacial envelope is devoted to decoupled payments.

Figure 13 - Simulation results (2013; DDA G-20)

EU farm income changes under the policy options considered with respect to "Status quo" in 2007.



	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Incomes change	38,3	44,2	-13,1	2,7	29,5	-229,2

Note: In the "Memorandum" scenarios it is assumed that in France and Spain 100% of the finacial envelope is devoted to decoupled payments.

Figure 14 - Simulation results (2007)
EU tariff revenue under the policy options considered.

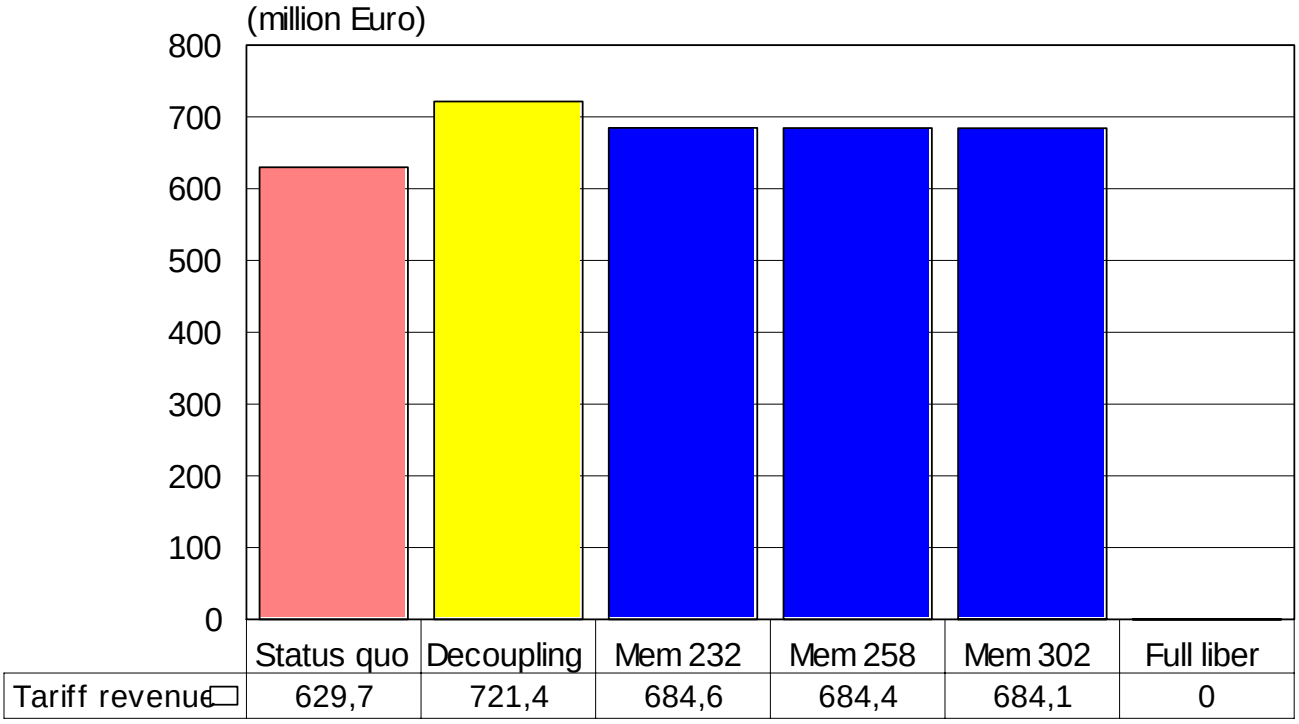


Figure 15 - Simulation results (2013; DDA G-20)
EU tariff revenue under the policy options considered.

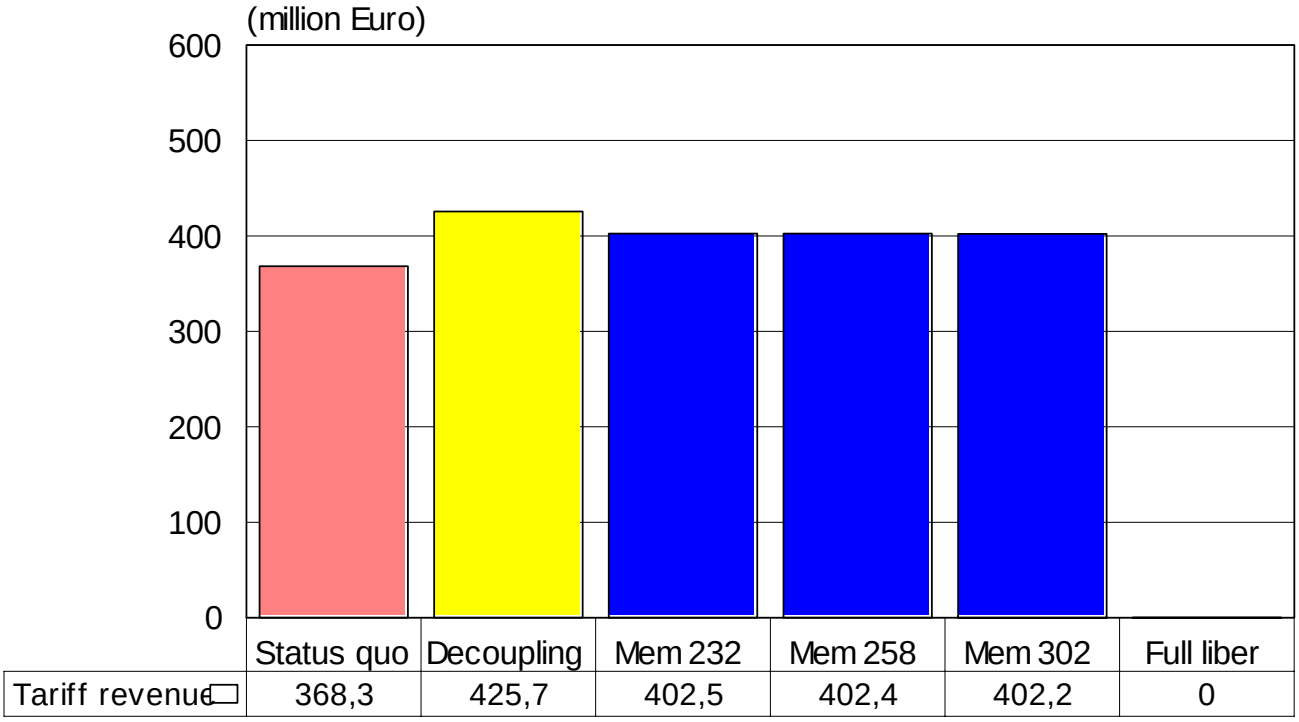
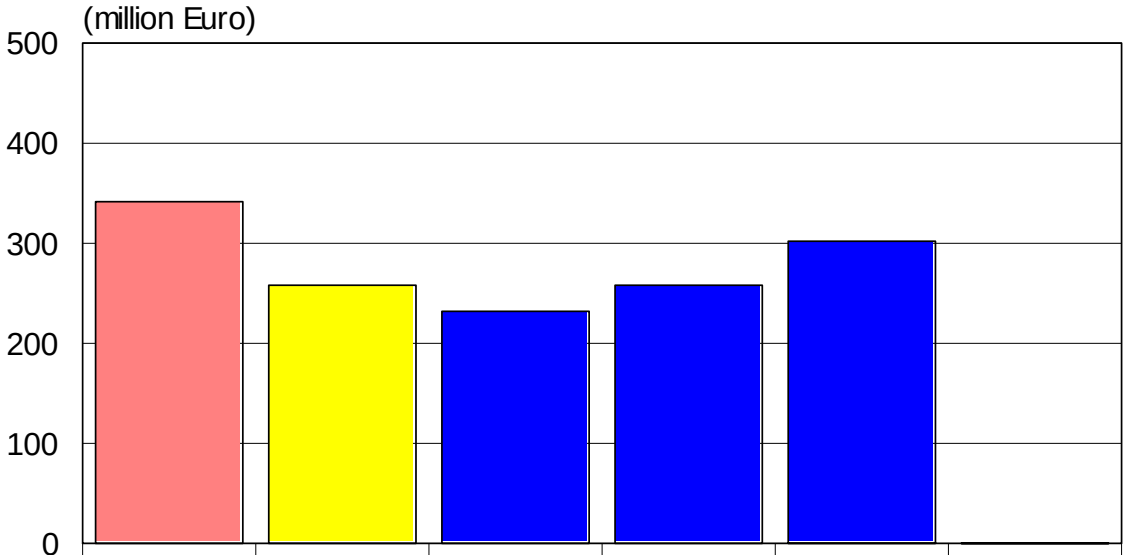


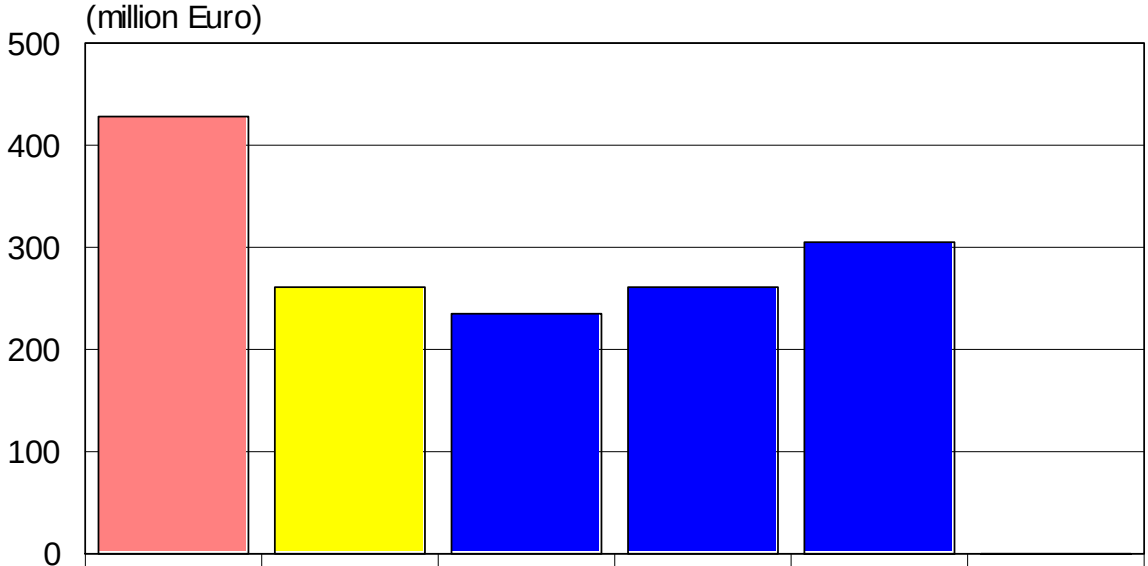
Figure 16 - Simulation results (2007)
EU CMO budget expenditure under the policy options considered.



	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Budget cost	341,6	258	232	258	302	0

Note: In the "Status quo" scenario it is assumed that the "standard" formula is used to calculate the "supplementaty" aid.

Figure 17 - Simulation results (2013; DDA G-20)
EU CMO budget expenditure under the policy options considered.



	Status quo	Decoupling	Mem 232	Mem 258	Mem 302	Full liber
Budget cost	428,1	261,1	235,1	261,1	305,1	0

Note: In the "Status quo" scenario it is assumed that the "standard" formula is used to calculate the "supplementaty" aid.

forecasted under the “Status quo” assuming a 55% reduction of the MFN tariff (DDA G-20), they are lower by 114.3 and 60.6 €/t, respectively.

EU imports equal 5.9 million t in 2007, 6.1 million t in 2009 and 6.5 million t in 2013. MFN exports to the EU equal 5.6 million t in 2007 and increase to 5.9 and 6.2 in 2009 and 2013. These increases are smaller than those in total MFN exports, as ACP and EBA countries now find it profitable to export bananas to countries different from the EU; in fact, their preferential margin competitiveness wedge on the EU market has been completely eroded as a result of the full trade liberalization on a multilateral basis.

Not surprisingly given the amount of support the sector currently receives through both domestic and border policy interventions, when these are removed farm incomes decline dramatically. The estimated reduction in EU banana producing farm incomes with respect to those under the “Status quo” option in 2007 equal 229.5 million €; even larger reductions are observed for 2009 and 2013.

The liberalization makes both the budgetary cost of the CMO and the tariff revenue vanish.

As is always the case when attempts are made to model the many forces at work in the real world to forecast the outcome of alternative economic policy choices, the results depend, to a certain extent, on the information used and the assumptions made. The main issues to keep in mind when considering the results of a model such as the one used in this study are:

a) the quality of the data available;

b) the assumption that other actors apart from the EU – i.e. multinationals involved in banana production and trade, large retail agglomerations and other countries – behave competitively;

c) the assumption that bananas are a homogeneous product;

d) the assumption that the supply of transportation services is infinitely elastic (i.e. banana trading is not constrained by transportation capacity, and transportation and other transaction costs do not vary either as a function of the volume traded or over time).

The assumption that the banana market is perfectly competitive seems particularly sensitive, despite (i) the fact that it has been used in all analyses of policy issues in this market so far, (ii) that there is no definite evidence of multinationals exerting market power, and (iii) that the sign of the impact of the new EU import regime on the structure of the banana market remains *a priori*

ambiguous (will the elimination of quota A/B licences make the banana market more or less competitive?).

4. Sensitivity analyses

The sensitivity of the results generated by the model to the parameters it uses has been assessed with respect to:

(a) the value of the €/$ exchange rate;

(b) the parameters describing technological improvements in production over time (supply shifts);

(c) the values of the supply elasticities in the member states; and

(d) the value of the demand price elasticity in the EU-15.

These analyses should provide the reader with a sense of "by how much" and "in which direction" the results presented above would have changed if different assumptions had been made with respect to these parameters.

The sensitivity analyses have been conducted with reference to only two of the seven scenarios considered above for each policy option: (i) 2007 and (ii) 2013, assuming that the WTO DDA round has been concluded, that the agreement reached foresees a 55% reduction of bound tariff rates and that the agreement has been fully implemented by that year (labelled above as "DDA G-20" scenario). Only one of the "Memorandum" options, that associated with a budget expenditure equal to 302 million €, has been considered.

In the simulations presented in section 3 the €/$ exchange rate used is 1.15 , the exchange rate used by the EU Commission in its medium term forecasts. Two alternative values have been considered to test the sensitivity of the results to this parameter: 1.05 and 1.25 (Tables 9 and 10). Changes in the exchange rate modify the competitiveness of imports *vis a vis* domestic production, with a higher exchange rate increasing their competitiveness and a lower exchange rate, on the contrary, making imported bananas less competitive on the EU market. Hence, everything else held constant, when the exchange rate is 1.25 imports are higher and domestic prices lower than those in the simulations presented in section 3 above; the opposite is the case when the exchange rate is set equal 1.05. When the results presented in Tables 9 and 10 are compared with those presented above, the differences appear relatively small and certainly not of such an order of magnitude as to modify their normative implications.

Table 9 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when the €/$ exchange rate is assumed to be 1.05 (rather than 1.15) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5202,0**	**5173,4**	**5184,1**	**5867,8**	**6161,9**	**6118,1**	**6135,2**	**6460,6**
EU production (000 t)	**893,2**	**371,4**	**566,5**	**145,0**	**1038,5**	**270,6**	**565,7**	**157,5**
Spain	*429,1*	*165,1*	*286,3*	*71,7*	*456,9*	*116,3*	*286,3*	*73,1*
France	*418,7*	*174,9*	*234,5*	*55,5*	*503,7*	*124,5*	*234,5*	*62,1*
Portugal	*21,9*	*9,1*	*23,5*	*3,6*	*21,9*	*5,8*	*21,1*	*3,4*
Greece	*2,4*	*0,9*	*0,9*	*0,4*	*2,4*	*0,6*	*0,6*	*0,4*
Cyprus	*21,1*	*21,4*	*21,3*	*13,8*	*53,6*	*23,4*	*23,2*	*18,5*
EU imports (000 t)	**4308,8**	**4802,0**	**4617,6**	**5722,8**	**5123,4**	**5847,8**	**5569,5**	**6303,2**
EU border (cif) price (€/t)	**524,6**	**530,9**	**528,5**	**374,2**	**428,5**	**437,2**	**433,8**	**369,0**
EU tariff revenue (mill €)	**606,7**	**693,1**	**660,8**	**0,0**	**362,2**	**417,2**	**396,1**	**0,0**
Total budget expenditure* (mill €)	**317,2**	**258,0**	**302,0**	**0,0**	**404,3**	**261,1**	**305,1**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

Table 10 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when the €/$ exchange rate is assumed to be 1.25 (rather than 1.15) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5454,0**	**5427,3**	**5438,9**	**6137,1**	**6447,9**	**6408,0**	**6425,1**	**6755,6**
EU production (000 t)	**889,8**	**313,9**	**562,6**	**83,4**	**1034,0**	**203,8**	**559,4**	**88,8**
Spain	*429,1*	*139,5*	*286,3*	*44,5*	*456,9*	*88,7*	*286,3*	*44,7*
France	*418,7*	*148,0*	*234,5*	*26,4*	*503,7*	*91,6*	*234,5*	*28,0*
Portugal	*21,9*	*7,7*	*23,2*	*2,1*	*21,9*	*4,4*	*19,7*	*1,9*
Greece	*2,4*	*0,7*	*0,7*	*0,2*	*2,4*	*0,4*	*0,4*	*0,2*
Cyprus	*17,7*	*18,0*	*17,9*	*10,2*	*49,1*	*18,7*	*18,5*	*14,0*
EU imports (000 t)	**4463,2**	**5113,3**	**4876,1**	**6053,6**	**5413,8**	**6204,3**	**5865,7**	**6666,7**
EU border (cif) price (€/t)	**471,4**	**477,3**	**474,8**	**317,7**	**375,0**	**382,9**	**379,5**	**313,6**
EU tariff revenue (mill €)	**649,0**	**745,2**	**703,7**	**0,0**	**376,2**	**435,9**	**410,3**	**0,0**
Total budget expenditure* (mill €)	**362,2**	**258,0**	**302,0**	**0,0**	**447,7**	**261,1**	**305,1**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

Table 11 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when yearly per cent increases in yields in Cyprus, France and Spain are assumed to be 0 (rather than 5, 3.13 and 1.05 , respectively) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5334,1**	**5309,0**	**5321,8**	**6013,0**	**6305,5**	**6272,5**	**6291,6**	**6618,7**
EU production (000 t)	**805,6**	**306,1**	**560,2**	**100,8**	**820,4**	**184,9**	**553,7**	**95,4**
Spain	*407,3*	*143,8*	*286,3*	*54,2*	*407,3*	*90,7*	*286,3*	*51,7*
France	*358,9*	*137,8*	*234,5*	*34,2*	*358,9*	*76,4*	*234,5*	*31,3*
Portugal	*21,9*	*8,4*	*23,4*	*2,8*	*21,9*	*5,1*	*20,3*	*2,6*
Greece	*2,4*	*0,8*	*0,8*	*0,3*	*2,4*	*0,5*	*0,5*	*0,3*
Cyprus	*15,1*	*15,3*	*15,2*	*9,3*	*29,9*	*12,2*	*12,1*	*9,5*
EU imports (000 t)	**4528,5**	**5002,9**	**4761,6**	**5912,2**	**5485,1**	**6087,6**	**5737,9**	**6523,4**
EU border (cif) price (€/t)	**496,8**	**502,3**	**499,5**	**343,7**	**401,8**	**408,3**	**404,5**	**339,3**
EU tariff revenue (mill €)	**644,0**	**727,1**	**684,8**	**0,0**	**383,8**	**429,3**	**402,9**	**0,0**
Total budget expenditure* (mill €)	**315,3**	**258,0**	**302,0**	**0,0**	**388,4**	**261,1**	**305,1**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

In the simulations presented in the previous section it has been assumed that supply functions in Greece and Portugal do not move, while those in Cyprus, France and Spain shift downward over time due to increased yields. The results obtained when it is assumed that none of the supply functions in the EU shift downward over time are presented in Table 11. Changes in production inCyprus, France, Greece, Portugal and Spain are now only driven by changes in the policy setting and market conditions. The difference for forecasted domestic banana production is greater under the "Status quo" option, when coupled deficiency payments "push" production upward along the supply curve; in 2007 the difference is 86 thousand t, in 2013 it becomes 216 thousand t. For the other policy options the differences are much smaller. For the "Memorandum" option the volume of bananas domestically produced is not affected by the assumption made, as producers in France and Spain find it profitable to produce the minimum volume of bananas which entitles them to receive their full entitlement of decoupled payments.

The sensitivity of the results obtained to the assumption made with respect to the price elasticity of the supply functions in the EU countries has been assessed by assuming these parameters to be equal, instead of 1, to 1.3 (Table 12) or 0.7 (Table 13). These parameters describe how production reacts to changes in relevant producer prices (when support is coupled this includes the per unit direct payment). The higher the elasticity, the more production increases (decreases) for a given increase (decrease) of the producer price. The assumption made regarding the values of domestic supply elasticities becomes less or more relevant depending on the policy option considered; it is more relevant when the price change induced by the policy option is greater, as is the case under "Decoupling" and "Full liberalization". In 2013, when the elasticities are set equal 1.3 under these scenarios the price reduction makes banana production no longer profitable in any member state apart from Cyprus; on the contrary, when elasticites are set equal 0.7 production is much higher than that forecasted in the simulations presented in section 3. Very small differences are observed as a result of the assumption made on domestic supply elasticties under the "Status quo" and the "Memorandum"; in fact, these two policy options determine either no change of the relevant production price ("Status quo") or a strong incentive for the two largest producing countries to produce at least the "threshold" volume which allows them to receive the full amount of decoupled payments ("Memorandum").

Finally, the sensitivity of the results obtained to the assumption made with respect to the price elasticity of the demand function in the EU-15 has been assessed by setting this parameter equal to two extreme values, -0.2 and -0.8, instead of -0.5 (Tables 14 and 15). The price elasticity of the demand function describes how the demand for bananas reacts to a price change. The higher the elasticity in absolute value, the more consumption increases (decreases) for a given decrease

Table 12 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when supply elasticies in Cyprus, France, Greece, Portugal and Spain are assumed to be 1.3 (rather than 1) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5338,5**	**5302,7**	**5322,1**	**6008,6**	**6317,2**	**6264,0**	**6292,1**	**6614,7**
EU production (000 t)	**893,1**	**180,2**	**565,9**	**11,5**	**1046,0**	**22,0**	**562,2**	**15,5**
Spain	*429,1*	*69,3*	*286,3*	*0,0*	*456,9*	*0,0*	*286,3*	*0,0*
France	*418,7*	*84,7*	*234,5*	*0,0*	*503,7*	*0,0*	*234,5*	*0,0*
Portugal	*21,9*	*4,4*	*23,6*	*0,0*	*21,9*	*0,1*	*19,9*	*0,0*
Greece	*2,4*	*0,3*	*0,3*	*0,0*	*2,4*	*0,0*	*0,0*	*0,0*
Cyprus	*21,0*	*21,5*	*21,2*	*11,5*	*61,1*	*21,9*	*21,5*	*15,5*
EU imports (000 t)	**4445,4**	**5122,5**	**4756,0**	**5997,1**	**5271,1**	**6242,0**	**5729,9**	**6599,2**
EU border (cif) price (€/t)	**495,8**	**503,7**	**499,4**	**344,7**	**399,4**	**410,0**	**404,4**	**340,1**
EU tariff revenue (mill €)	**629,4**	**748,0**	**683,8**	**0,0**	**367,6**	**440,9**	**402,3**	**0,0**
Total budget expenditure* (mill €)	**341,6**	**258,0**	**302,0**	**0,0**	**428,2**	**261,1**	**305,1**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

Table 13 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when supply elasticies in Cyprus, France, Greece, Portugal and Spain are assumed to be 0,7 (rather than 1) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5338,3**	**5318,9**	**5322,0**	**6024,6**	**6316,2**	**6286,9**	**6292,1**	**6633,7**
EU production (000 t)	**889,6**	**502,2**	**564,8**	**341,5**	**1026,1**	**462,3**	**562,5**	**382,1**
Spain	*429,1*	*233,9*	*286,3*	*167,6*	*456,9*	*207,0*	*286,3*	*176,3*
France	*418,7*	*236,9*	*236,6*	*152,2*	*503,7*	*224,3*	*234,5*	*180,0*
Portugal	*21,9*	*12,4*	*23,0*	*8,5*	*21,9*	*10,0*	*20,8*	*8,3*
Greece	*2,4*	*1,3*	*1,3*	*0,9*	*2,4*	*1,1*	*1,1*	*0,9*
Cyprus	*17,5*	*17,7*	*17,6*	*12,3*	*41,2*	*19,9*	*19,8*	*16,6*
EU imports (000 t)	**4448,7**	**4816,7**	**4757,2**	**5683,2**	**5290,0**	**5824,5**	**5676,7**	**6251,6**
EU border (cif) price (€/t)	**495,8**	**500,1**	**499,4**	**341,2**	**399,7**	**405,5**	**404,4**	**336,3**
EU tariff revenue (mill €)	**630,0**	**694,5**	**684,0**	**0,0**	**369,0**	**409,4**	**402,2**	**0,0**
Total budget expenditure* (mill €)	**341,5**	**258,0**	**302,0**	**0,0**	**428,1**	**261,1**	**305,1**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

Table 14 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when the import demand elasticity for the EU-15 is assumed to be -0,2 (rather than -0.5) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5080,8**	**5065,5**	**5071,8**	**5445,6**	**5826,4**	**5802,7**	**5812,5**	**5996,3**
EU production (000 t)	**891,2**	**336,4**	**564,2**	**102,8**	**1036,1**	**226,2**	**561,8**	**109,5**
Spain	*429,1*	*149,6*	*286,3*	*53,3*	*456,9*	*98,2*	*286,3*	*53,5*
France	*418,7*	*158,3*	*234,5*	*35,0*	*503,7*	*102,1*	*234,5*	*37,5*
Portugal	*21,9*	*8,3*	*23,3*	*2,6*	*21,9*	*4,9*	*20,2*	*2,4*
Greece	*2,4*	*0,8*	*0,8*	*0,3*	*2,4*	*0,5*	*0,5*	*0,3*
Cyprus	*19,1*	*19,4*	*19,3*	*11,6*	*51,2*	*20,5*	*20,3*	*15,8*
EU imports (000 t)	**4189,6**	**4729,1**	**4507,6**	**5342,8**	**4790,3**	**5576,5**	**5250,7**	**5886,9**
EU border (cif) price (€/t)	**492,8**	**499,1**	**496,5**	**337,3**	**394,2**	**402,8**	**399,2**	**332,3**
EU tariff revenue (mill €)	**584,7**	**679,1**	**640,3**	**0,0**	**331,3**	**390,7**	**366,1**	**0,0**
Total budget expenditure* (mill €)	**344,1**	**258,0**	**302,0**	**0,0**	**432,5**	**261,1**	**302,0**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

Table 15 - Sensitivity analysis. Simulation results for the 2007 and 2013 DDA G-20 scenarios when the import demand elasticity for the EU-15 is assumed to be -0,8 (rather than -0.5) .

	2007				2013 DDA G-20			
	Status quo	Decoupling	Memorandum 302	Full liberalization	Status quo	Decoupling	Memorandum 302	Full liberalization
EU consumption (000 t)	**5749,0**	**5545,0**	**5560,9**	**6554,9**	**6784,6**	**6724,5**	**6749,7**	**7213,5**
EU production (000 t)	**890,0**	**344,4**	**564,6**	**120,9**	**1036,1**	**242,9**	**562,8**	**131,3**
Spain	*429,1*	*152,9*	*286,3*	*60,8*	*456,9*	*104,6*	*286,3*	*62,1*
France	*418,7*	*162,5*	*234,5*	*44,6*	*503,7*	*111,4*	*234,5*	*50,0*
Portugal	*21,9*	*8,5*	*23,4*	*3,0*	*21,9*	*5,2*	*20,5*	*2,8*
Greece	*2,4*	*0,8*	*0,8*	*0,3*	*2,4*	*0,5*	*0,5*	*0,3*
Cyprus	*17,9*	*19,7*	*19,6*	*12,2*	*51,2*	*21,2*	*21,0*	*16,1*
EU imports (000 t)	**4859,0**	**5200,7**	**4996,2**	**6433,9**	**5748,5**	**6481,6**	**6186,9**	**7082,2**
EU border (cif) price (€/t)	**474,6**	**504,6**	**502,2**	**350,0**	**404,7**	**412,9**	**409,4**	**345,9**
EU tariff revenue (mill €)	**700,7**	**761,7**	**725,9**	**0,0**	**403,7**	**459,0**	**436,8**	**0,0**
Total budget expenditure* (mill €)	**359,5**	**258,0**	**302,0**	**0,0**	**424,0**	**261,1**	**302,0**	**0,0**

** : in the "Status quo" scenario it is assumed that the "supplementary aid" is calculated using the standard formula.*

(increase) of the consumer price. Hence, the assumption made regarding this parameter becomes more relevant the greater the price change induced by the policy option considered; this means the most marked differences are to be observed for the simulation of the "Full liberalization" scenario in 2013. Under this reference scenario, in 2013 when the elasticity is set equal -0.2 banana consumption in the EU-25 is forecasted to equal 6 million t, while it is 6.6 million t with the elasticity set at -0.5; on the contrary, when the elasticity is set equal -0.8 consumption reaches 7.2 million t. Smaller differences are observed in the simulations for 2007. When the other policy options are considered, the difference between the forecasted volume of banana consumption on the assumption that the demand price elasticity in the EU-15 is -0.2 and -0.8 and that obtained when this parameter equals -0.5 becomes roughly half of that observed under "Full liberalization".

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