Economic Partnership Agreements and WTO negotiations. A quantitative assessment of trade preference granting and erosion in the banana market.*

Giovanni Anania

Department of Economics and Statistics, University of Calabria
87030 Arcavacata di Rende (Cs), Italy;
E-mail: ganania@unical.it.

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Abstract

The paper provides a quantitative assessment of the impact on the banana market of the expansion of trade preferences the EU granted ACP countries with the Economic Partnership Agreements (EPA) and of the possible erosion of these preferences as a result of different possible endings, if any, of on-going WTO negotiations. The results of the simulations performed suggest that the impact of the EPA on the production and consumption of bananas in the EU will be limited, while benefits for ACP countries will be significant (at the expense of MFN exporters). However, a final agreement in the WTO DDA round may bring an erosion of the preferential margins currently enjoyed by ACP countries of such an order of magnitude as to cancel out most of these benefits. The actual outcome will depend on the EU bound tariff for bananas which will be subject to the reduction commitments (will this be the one indicated in the Uruguay Round EU "schedules", or the tariff introduced with the reform of the EU import regime for bananas in 2006?); on whether bananas will be included among "tropical products"; and, if this is the case, on the provisions for "tropical products" contained in the final agreement. Possible outcomes of current bilateral negotiations between the EU and MFN exporters are analyzed as well.

Key words: bananas; WTO; Economic Partnership Agreements; trade preferences; preference erosion; partial equilibrium models; spatial models.

JEL classification: Q17, Q18, F13

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1. Introduction

Trade preferences for developing country exports are widely used, either under a multilateral umbrella, such as the GSP schemes, on a regional basis, such as the US African Growth and Opportunity Act (AGOA) scheme, or bilaterally. The expected *a priori* effects of preferential trade agreements are well known; obstacles which may limit their effectiveness in practice are discussed, among the others, by Bureau, Disdier and Ramos (2007), Candau and Jean (2005), Gallezot and Bureau (2004), Manchin (2006) and Panagariya (2002). A reduction of MFN tariffs as a result of multilateral negotiations would imply a reduction, or the vanishing, of existing trade preference margins. Applied MFN tariffs in agriculture are much higher than those for manufactured goods; this implies that both the value of existing preferences and potential losses associated to the reduction of MFN tariffs are in agriculture much more relevant than in other sectors (Alexandraki and Lankes 2004; Bouët, Bureau, Decreux and Jean 2005; Bouët, Fontagné and Jean 2006; Bureau, Disdier and Ramos 2007; Goodison 2007; Law, Piermartini and Richtering 2006; Lippoldt and Kowalski 2005; Tangermann 2002; Yamazaki 1996; Yang 2005; Yu and Jensen 2005, Wainio and Gibson 2004). It has been already decided that the final agreement of the Doha Development Agenda round of WTO negotiations on agriculture, if any, will include provisions addressing the issue of preference erosion.

This paper focuses on trade preferences and preference erosion with reference to the banana market, possibly the single market where benefits from trade preferences and potential losses from preference erosion are larger (Alexandraki and Lankes 2004; Law, Piermartini and Richtering 2006; Yang 2005) and conflicts among the different interests involved more evident and vocal.

The European Union (EU) is the world's largest importer of bananas and among the top 20 largest producers. Domestic production covers around one sixth of domestic consumption,

with imports from MFN and preferred African, Caribbean and Pacific (ACP) countries covering two thirds and one sixth of the EU market, respectively. All major exporters of bananas are developing countries and in most of them bananas account for an important share of export revenue; for Costa Rica, Ecuador, Guatemala, Honduras and Panama this share was in 2006 around 10 per cent. Historically the EU import regime for bananas has been a source of heated political confrontations, involving the conflicting interests of domestic producers and consumers, multinational firms that control a large share of international trade, holders of quota licences under the previous EU trade regimes, least developed country exporters, preferred developing country exporters and developing country exporters subject to MFN conditions (Anania 2006; Josling 2003; Read 2001; Tangermann 2003a and 2003b; Thagesen and Matthews 1997).

On 1 January 2008 the EU implemented the Economic Partnership Agreements (EPA) it had negotiated with many ACP countries (EC 2007).[1] The EPA will progressively remove barriers to trade between the EU and several groups of ACP countries creating free trade areas which are expected to be compatible with WTO rules.[2] All agricultural goods from the ACP countries which have successfully concluded the negotiations are now allowed duty- and quota-free access to the EU. Bananas, with sugar and rice (for which, however, the Agreements call for a progressive removal of EU market protection by 2010), have been indicated as the three single agricultural commodities where most of the export benefits of the EPA for ACP countries are to be gained.

This paper focuses on the impact of the EPA and on the implications of the possible conclusion of WTO negotiations for bananas. It provides a quantitative assessment of the expected benefits for ACP banana exporters of the elimination, as a result of the EPA, of the EU preferential import quota for ACP banana exports in place until 2007 and of the reduction of these benefits as a result of the erosion of preferential margins deriving from the conclusion of

[1] Actually these are "interim" agreements, with the exception of the one signed with the Caribbean CARIFORUM countries.

[2] A WTO waiver allowing the EU to grant ACP countries under the Cotonou Agreement unilateral trade preferences which discriminated against other developing countries expired at the end of 2007.

negotiations which are currently taking place at the WTO. In particular, the paper will consider the effects of the preference erosion which would derive from the lowering of the tariff applied to EU MFN imports due either to the conclusion of the DDA round or, if this should not happen, to the successful conclusion of the negotiations involving the EU, on one side, and several MFN exporters and the U.S., on the other, to try to bring to an end the long standing so called "Bananas III" dispute at the WTO.[3] These negotiations overlap and are somehow interlinked with those for the creation of Free Trade Areas (FTAs) between the EU and the Andean Community and the Central American Free Trade Area, where bananas remain among the most sensitive issues.

The results obtained suggest that the impact of the EPA on production and consumption of bananas in the EU will be limited, while benefits for ACP countries are definitely expected to be significant. However, the final agreement of the WTO DDA round (if any), or a conclusion of the negotiations between the EU and MFN exporters to put an end to the banana dispute, may bring an erosion of the preferential margins currently enjoyed by ACP countries of such an order of magnitude as to cancel out most of these benefits. The actual outcome will depend on the EU bound tariff for bananas which will be subject to the reduction commitments (will this be the one indicated in the Uruguay Round EU "schedules", or the tariff introduced with the reform of the EU import regime for bananas in 2006?); on whether bananas will be included among "tropical products"; and, if this should be the case, on the provisions for "tropical products" contained in the final agreement.

2. The model

The model used is an expanded and updated version of the one used in Anania (2006, 2008); the main improvements are: the data base referring to 2005 (in Anania (2006, 2008) it referred to

[3] The dispute dates back to 1996. The most recent episodes of the dispute refer to complaints by Ecuador in November 2006 and the U.S. in June 2007 that the "tariff only" regime the EU had introduced on 1 January 2006 did not comply with WTO rules. In both cases the panels concluded that the preferences granted by the EU to bananas originating in ACP countries were not compliant with its Most Favoured Nation obligations.

2002); the five EU banana producing member states being modelled individually; the modelling of the 2007 EU enlargement to Bulgaria and Romania.

It is a single commodity, spatial, partial equilibrium, mathematical programming model (Takayama and Judge 1971); a "quasi-welfare" function (Samuelson 1952) is maximized subject to a set of constraints describing relevant demand and supply functions, price linkages (due, for example, to transportation costs and policy interventions) and policies which cannot be represented through an exogenously determined price wedge.

The fact that the model is "spatial" – i.e., it is solved for the trade flows between each ordered pair of countries – makes it particularly suitable for representing policies that apply different regimes to imports from different countries without having to make unrealistic assumptions. This holds for both the current and previous EU trade regimes for bananas, which include TRQs applied on imports originating in specific groups of countries and preferential tariffs.

Spatial models have been used to analyse the banana market by Kersten (1995) and Spreen *et al.* (2004). More often, however, non-spatial models have been used (Arias *et al*., 2005; Borrell, 1997; Guyomard *et al*., 1999a, 1999b and 2006; Guyomard and Le Mouël, 2003; and Vanzetti *et al.*, 2005). The inability of a non-spatial model to generate bilateral trade flows has often been bypassed by assuming *a priori* that the existing TRQs are either binding or not binding (Arias *et al.*, 2005; Vanzetti *et al*., 2005; Guyomard *et al*., 1999a and 1999b). However, whether a quota is binding or not is an empirical question, which needs to be answered endogenously by the modelling exercise. In addition, non-spatial models cannot include the possibility of out-of-quota imports taking place subject to a tariff higher than that imposed on in-quota imports. Finally, non-spatial models cannot consider the EBA initiative in the simulations of the current EU import regime. In Vanzetti *et al.* (2005), the limitations of non-spatial models in dealing with discriminatory trade policies are circumvented by assuming imperfect substitution between bananas produced in different countries (Armington, 1969), implying that

bananas are not a homogeneous good and that consumers are able to differentiate them by their country of origin.

The model includes five sources of domestic supply within the EU,[4] fifteen exporting[5] and five importing countries/regions.[6] 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. Functions in the base year are obtained from observed imported, produced and exported quantities, observed import, production and export prices, and import demand, supply and export supply price elasticities at the equilibrium in each country/region (Table 1). The values of the elasticities used are exogenously determined and are based on those used elsewhere (Anania 2006; Arias *et al*. 2005; Guyomard, Laroche and Le Mouël 1999; Kersten 1995; Spreen *et al.* 2004; and Vanzetti *et al.* 2005) (Table 1). The sources for the data used in the model are the FAOSTAT and COMTRADE databases, the World Bank and the European Commission.

EU "compensatory aid" deficiency payments to domestic banana producers in France, Spain, Portugal and Greece in place in 2005 are modelled; "compensatory" and "supplementary aid" payments are subject to the financial stabilizer mechanism. Domestic support being based on deficiency payments implies that domestic banana production in the EU is in the base 2005 model independent of the market price of bananas.

The modelling of the EU-25 import regime in 2005 includes:

(a) a 3,113,0000 t tariff rate import quota (TRQ), with in-quota imports subject to a 75 €/t tariff (ACP exports can enter this quota duty-free);

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

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

[4] France (Martinique and Guadalupe), Spain (Canary Islands), Portugal (Madeira and Azores), Greece (Crete) and Cyprus. Banana production in continental Portugal is negligible and has been ignored.

[5] Six ACP countries/regions (Ivory Coast, Cameroon, Dominican Republic, Belize and Suriname, other ACP net exporter non-LDC countries, and ACP net exporter LDC countries) and nine MFN countries/regions (Ecuador, Colombia, Costa Rica, Panama, Honduras, Brazil, Guatemala, other MFN net exporter non-LDC countries, and MFN net exporter LDC countries).

[6] EU15, EU10, Bulgaria and Romania, United States, Rest of the world net importers.

For Bulgaria and Romania, U.S. and the "Rest of the world net importers" the model includes the tariffs applied in 2005; these equal 19.1%, 0.5% and 18.9%, respectively.

The calibration of the 2005 base model, presented in Table 1, appears satisfactory. The simple average percentage difference, in absolute value, between observed and predicted exports in 2005 is 2.4%; the analogous value for imports is 3.5%. If the exports- and imports-weighted per cent differences, in absolute value, are considered instead, the average differences become 2.3% and 2.8%, respectively.

In the 2005 base model solution both EU TRQs are filled; ACP exports to the EU-25 equal 750,000 t, those by non-ACP countries equal 3,113,000 t and no ACP exports to the EU occur under the quota open to MFN exporters. LDC total exports of bananas equal 71 thousand t.

All simulations have been generated with reference to 2013, when the 2006 reform of the EU domestic policies for bananas is to be fully implemented in all countries[7] and it will be possible to assess the market effects of the adjustments in production decisions as a result of the changes in both the EU import and domestic policy regimes as well as the implications of a successful conclusion of the DDA round, should this be the case.

The 2013 base reference model has been obtained from the base 2005 one by modelling:

(a) the 2007 enlargement of the EU-25 to Bulgaria and Romania;

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

(c) the implementation of the EBA initiative;[8]

(d) the 2006 reform of the EU Common Market Organization (CMO) for bananas; and

(e) the changes in import demand and export supply functions in all countries/regions resulting from expected shifts in domestic demand and supply functions.

The dollar/euro exchange rate in 2013 has been assumed to be equal to 1.5 (in the 2005 base model it was 1.2441).

[7] In Cyprus the full implementation of the reform will take place in 2013.

[8] The implementation of the EBA initiative for bananas was completed in 2006.

The 2007 EU enlargement has been modelled by removing barriers to trade between Bulgaria and Romania and the EU-25 and by extending to them the EU import regime.

Imports from MFN countries are now subject only to a 176 €/t tariff. ACP countries are granted preferential duty-free access within a 775,000 t TRQ while out-of-quota exports are subject to the 176 €/t MFN tariff.

Banana exports from LDC countries 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.[9] Consumption is assumed to vary over time on the basis of observed changes in population and in per capita incomes between 2000 and 2005;[10] the values used for domestic demand income elasticities are provided in Table 1. Production in each country/region is assumed to change over time, *ceteris paribus*, in line with observed changes in banana yields between 1992-1995 and 2002-2005.[11]

The EU CMO for bananas in place until the end of 2006 provided generous and fully "coupled" support to domestic producers through a deficiency payment scheme; the per unit aid was given by the difference between a reference price, which did not change over time, and the observed domestic price. The December 2006 reform cancelled the CMO (EC 2006; Anania 2008). For banana producing areas outside the "outermost regions" (Greece, Cyprus and continental Portugal) support (€4.6 million) has been "decoupled" and included in the Single Farm Payment introduced by the June 2003 Fischler reform of the Common Agricultural Policy. For the "outermost regions" (France; Spain; Azores and Madeira in Portugal) financial resources of a similar order of magnitude to those previously absorbed by deficiency payments (€278.8 million) have been added to the budget allocation of their POSEI programmes; these programmes finance the use of a wide range of policy instruments, whose aim is to increase the

[9] The FAOSTAT data base is the source used for production and consumption data in 2005.
[10] In both cases the data source is World Bank (various years).
[11] The source is the FAOSTAT database.

competitiveness of agricultural production in these “disadvantaged” outermost regions. The decision on which policy instruments to implement is left to the individual member country. The reform is introduced in the model by removing the deficiency payments in place in 2005 and by modelling the policy instruments introduced in France, Spain and Portugal with their POSEI implementation decisions for 2007 (these have been confirmed, unchanged, for 2008):

(a) in France the entire budget allocation (€129.1 million) is devoted to “decoupled” payments calculated for each farm on the base of bananas produced in a reference period. In order to receive the full entitlement of “decoupled” payments, farms have to produce at least 80% of what they produced, on average, in the reference period (in total 255,267 t); if production is between 70% and 80% of what it was in the reference period, the farm will receive 80% of its entitlement of decoupled payments; if it is below 70% it will receive the same percentage of the entitlement. However, it turns out that the financial incentive (around 11,600 €/ha) is large enough to ensure that farms find it profitable to produce the minimum volume of bananas needed to enable them to claim the full amount of “decoupled” payments;

(b) in Spain the aid for open air banana production is assumed to be used to its maximum extent (7,600 ha; 9.1 million €) and the remaining budget allocation (€132 million) to be devoted to “decoupled” payments calculated on the base of bananas produced by each farm in a reference period. 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 reference period (in total 294,000 t). In this case too it turns out that the financial incentive (decoupled payments are in this case around 11,800 €/ha) is large enough for farms to find it profitable to produce the minimum volume of bananas needed to be able to claim the entire amount of decoupled payments they are eligible for;

(c) in Portugal the entire financial allocation is devoted to the introduction of a fully “coupled” fixed production subsidy. The amount of the per unit subsidy is given by the

financial allocation divided by the volume of banana production in Madeira and Azores used in the proposal for the POSEI programme for bananas put forward to the Commission by Portugal in 2007; this yields a subsidy equal to 455.2 €/t.[12] The subsidy expenditure cannot exceed Portugal's financial allocation (€8.7 million); if production is such that expenditure would exceed the maximum allowed, the per unit subsidy is cut *pro rata* so that the expenditure equals the budget allocation.

3. Results of the simulations

The results of the simulations are presented in Table 2.

In the "Base 2013" reference scenario the EPA and the outcome, if any, of the multilateral and regional negotiations are ignored. As explained above, with respect to the "Base 2005" simulation this scenario includes the 2007 enlargement of the EU-25 to Bulgaria and Romania, the EU "tariff-only" import regime introduced on 1 January 2006, the EBA initiative, the 2006 reform of the EU CMO for bananas, as well as changes in import demand and export supply functions as a result of expected changes in yields, population and per capita incomes. Despite the expected increase by 24 €/t of the domestic price of bananas, EU-27 consumption is forecast to expand between 2005 and 2013 by 360,000 t ; this is due to the combined effects on the EU demand for bananas of expected changes in per capita income and population (Table 1) and of the significantly stronger euro. Domestic production drops from 723,100 to 578,900 t as a result of the reform of the CMO for bananas. In France and Spain banana production is forecasted to equal the minimum threshold required for farms to claim the full amount of their entitlements of "decoupled" payments:[13] 255 and 294 thousand t, respectively, vs. 309 and 384 thousand t produced in 2005 under the previous domestic policy regime. In Portugal, where support remains

[12] The actual policy choice by Portugal is to introduce two different subsidies in Madeira and the Azores, equal to 446 €/t and 600 €/t, respectively; however, the structure of the model does not allow us to consider banana production in the two outermost regions separately.

[13] The model does not include uncertainty and, as a result, ignores the effects of risk on producer decisions in France and Spain. If producers are risk averse, their *ex ante* production decisions will target an expected volume of production above the minimum required for them to collect the full amount of support they are entitled to; this means that, *ex post*, on average, producers will overshoot their minimum production target and the model underestimates the expected value of domestic production in the EU.

fully “coupled” (although under a different policy regime), production equals 23 thousand t, while it was 19 thousand t in 2005. EU-27 imports increase by 500 thousand t. In the other two importing regions imports are forecasted to move in opposite directions; they are expected to increase by 370 thousand t in the USA and to decline by 275 thousand t in the Rest of the World. Imports decline in the Rest of the World despite the robust increase in population and per capita incomes as a result of the larger sensitivity of domestic demand to the price increase and, more important, for the large expected increases in yields in domestic banana production (Table 1). The stronger euro is the main factor explaining the expansion of ACP exports; ACP countries export 33 thousand t out of the quota, subject to the 176 €/t MFN tariff; in the first two years after the introduction of the new EU import regime observed ACP out-of-quota exports subject to MFN conditions were 116,000 t in 2006 and 62,000 t in 2007. MFN exports to the EU are forecasted to increase between 2005 and 2013 by 490,000 t as a result of the change in the EU import regime, of the increase in the €/$ exchange rate and of changes over time in domestic demand and supply functions; total MFN exports are expected to increase by 600,000 t . LDC are forecasted to exit the world market for bananas (LDC exports were 71,000 t in 2005) as a result of the loss of competitiveness over time of their bananas *vis a vis* both ACP and MFN ones, despite the introduction by the EU of the EBA initiative.

Seven policy scenarios are considered. All simulations are generated with respect to 2013 and they all include the implementation of the EPA; for bananas this meant the removal on January 1 2008 of the quota on EU imports from ACP countries, which now occur duty- and quota-free. Differences in the seven policy scenarios relate to the assumptions made with respect to the conclusion of WTO negotiations and the consequent banana tariff reductions.

The future of the DDA round remains unclear: *will an agreement be reached? when will this occur? what will be the “ambition” of the final agreement?* are all questions to which there is no easy answer. In the first two scenarios it is assumed that no DDA round agreement is reached. In the first it is assumed that on-going negotiations between the EU and MFN countries

to solve the current dispute in WTO also fail to achieve a mutually acceptable solution; hence, this scenario simulates the impact of the implementation of the EPA only. The second scenario assumes that, on the contrary, the EU and MFN countries reach a bilateral agreement that the current 176 €/t MFN tariff is replaced by a tariff equal to 110 €/t ; because there is no DDA agreement, the import tariffs imposed by the U.S. and the aggregation of all other net importing countries remain unchanged.

In the first scenario, the one simulating the impact of the EPA everything else remaining unchanged, the EU market is only marginally effected; total imports and consumption increase and domestic production and price decline as a result of the increased preferential market access, but by a small amount in every case. Where the impact of the EPA is felt is in the composition of EU imports. The removal of the import quota leads to an increase of ACP exports to the EU by 650 thousand t, while MFN exports to the EU decline by 620 thousand t . Imports and consumption in the other importing countries increase as a result of the expansion of the MFN export supply towards countries other than the EU because of the loss in relative competitiveness of MFN banana exports on this market; as a result, total MFN exports decline by 470 thousand t . Banana export revenue in ACP countries almost triples,[14] while it declines by 6.8% in MFN ones.

In the second scenario, the lower EU MFN tariff makes EU imports and consumption increase and tariff revenue drop with respect to the two scenarios considered so far. When compared to the values in the first scenario, EU domestic price is lower by 11.8%, consumption and imports increase by 5.3% and 6%, respectively, and tariff revenue declines by 27.1% ; EU domestic production is only slightly effected by the policy change, as production in France and Spain remains unchanged (it equals the minimum required for farmers to collect their full entitlements of direct payments)[15] and only production in Greece, Portugal and Cyprus adjusts to the change in domestic price. The 110 €/t tariff remains short of “compensating” MFN countries

[14] Export revenue for ACP countries in the “Base 2013” scenario does not include quota rents, which are assumed to be enjoyed by quota licence holders located outside the exporting country (importers in the EU or multinational trading firms).

[15] This is the case in all other scenarios as well.

for the loss of competitiveness of their exports on the EU market as a result of the EPA. In fact, if this second scenario is compared with the first one, MFN banana exports to the EU increase by almost 500 thousand t but remain below those in the "Base 2013" scenario; ACP exports to the EU decline by 230 thousand t, remaining well above those when the EPA are not in place. In order to allow for an assessment of the possible outcome of the negotiation between the EU and MFN exporters, in Figure 1 total EU imports and their composition by origin (ACP and MFN countries) are provided as a function of the agreed level of the EU MFN tariff; EU imports increase as the MFN tariff is reduced, MFN exports to the EU increase and those from ACP countries decline. The MFN tariff being equal to 176 €/t corresponds to scenario 1 in Table 2; if MFN countries are granted the same treatment as ACP ones (i.e. all EU imports of bananas occur duty- and quota-free), total EU imports reach 5.16 million t , MFN exports to the EU 4.318 million t and ACP exports contract to 842 thousand t, a volume still above the one in the no-EPA, no-agreement "Base 2013" scenario. The MFN tariff which would bring MFN exports to the EU back to their pre-EPA volume (3.605 million t) is equal to 94 €/t ; this tariff would yield EU imports (4.778 million t), and ACP exports (1.172 million t) well above their levels in the "Base 2013" scenario.

The other five scenarios all assume that a DDA agreement is reached, the implementation period ends in 2013,[16] and bananas are not included by the EU among its "sensitive" products; the latter is mainly based (a) on unofficial information regarding developments in the negotiations on agriculture[17] and (b) on the presumption that it is unlikely that the EU will be willing to reintroduce import quotas for bananas.

In the third and fourth scenarios it is assumed that bananas will eventually be excluded from the list of "tropical products"; the difference between these two scenarios is in the agreed level of the EU bound MFN tariff which is to be reduced. In the third scenario this is assumed to be the

[16] This means assuming that an agreement is reached by the end of 2008, the implementation period starts in 2009 and lasts five years (WTO 2008b), and ignoring differences in the length of the implementation period for developed and developing countries.

[17] Bridges weekly (ICTSD 2008) reported that MFN exporters had prevailed on preference-receiving countries in having bananas removed from "a potential list of sensitive products" to be designated by major importers.

final bound tariff indicated in the "schedules" contained in the 1994 Uruguay round Agreement on Agriculture (680 €/t) and that this is to be reduced by 66% (the *ad valorem* tariff equivalent exceeds 75% and the lowest value in the range indicated in WTO (2008a) for the per cent reduction to be applied in the uppermost of the four tiers foreseen is used.[18] The bound tariff obtained equals 231.2 €/t, which is higher than the applied tariff of 176 €/t; this means that in this case the agreement would leave the EU import regime unchanged, and only import tariffs applied by the other importing countries are reduced. The fourth scenario assumes that the current bound tariff is the one introduced by the EU on January 1 2006 (176 €/t) and that this is to be reduced by 55% (the *ad valorem* equivalent falls between 20% and 50% and, again, the lower value in the range indicated in WTO (2008a) for this tier is used); the result is a tariff applied by the EU in 2013 equal to 79.2 €/t . In both scenarios three and four the import tariffs applied by the U.S. and the aggregation of the other net importing countries are reduced by 48% (the lower bound of the range for the tariff reduction indicated in WTO (2008a) for the 0%-20% tier).[19]

In the third scenario the only difference with respect to the first are the changes in the import tariffs imposed by the U.S. and the "Rest of the world net importers" (these are reduced from 0.5% to 0.3% and from 18.9% to 9.8%, respectively). The market impact of these changes is relatively small; banana imports by the "Rest of the world net importing countries" increase by 285 thousand t, while EU and U.S. imports slightly decline; for the U.S. this is due to the fact that the reduction in market protection by the Rest of the world overcomes the effect of lowering the (already low) protection of its own domestic market. Both MFN and ACP exports increase, although by relatively small volumes. When in scenario four the EU import tariff is also reduced - from 176 to 79.2 €/t - then the impact of the DDA agreement is more marked. When compared with those in the first scenario, EU consumption and imports increase by 370 and 375 thousand t;

[18] This remained unchanged in the most recent revision of the draft modalities for agriculture (WTO 2008b).

[19] In WTO (2008b) the ranges for the possible tariff cuts in WTO (2008a) for the 0%-20% and 20%-50% tiers have been replaced by proposed tariff cuts of 50% and 57%, respectively, which are only slightly above those used here.

ACP countries lose competitiveness on the EU market and their exports decline by 325 thousand t, while MFN exports to the EU expand by 700 thousand t; total MFN exports increase by 798 thousand t and imports by the U.S. and the other net importing countries decline by 79 thousand t and increase by 177, respectively. Export revenue declines in ACP countries by 37.5% and increases in MFN countries by 12%.

In the final three scenarios bananas are assumed to be subject to the provisions, to be decided, for "tropical products". What the interpretation in the final agreement will be of the "*full liberalization of trade in tropical agricultural products*" WTO member countries agreed in 2004 (WTO 2004) remains to be seen; based on the July 2007 attempt by Crawford Falconer, the current Chair of the committee for the negotiations on agriculture in the DDA round, to summarize the status of the negotiations at that point (WTO 2007; para. 114, p. 18) two possible interpretations are considered here: (a) "*full liberalization*" to be translated in tariff- and quota-free market access for "tropical products", or (b) import tariff reductions for "tropical products" in each country to be set equal to the largest reduction applied in the same country to agricultural import tariffs. These alternatives possibly represent the boundaries for the decision to be taken in the final agreement regarding "tropical products". Hence, the fifth scenario assumes tariffs on banana imports in 2013 to be all set equal to zero. The last two scenarios assume instead that all bound tariffs for bananas are reduced by 66% (the lowest value of the range of the per cent tariff reduction envisaged both in WTO (2008a) and WTO (2008b) for the uppermost tier); in the sixth scenario the EU bound tariff to be reduced is assumed to be 680 €/t; in the seventh to be 176 €/t.

In the fifth scenario banana trade is fully liberalized. As a result, EU consumption and imports are the largest among all scenarios considered (they equal 5,693 and 5,123 thousand t, respectively). The same is true for MFN exports, both in total (13.3 million t) and to the EU (4.2 million t). On the contrary, ACP countries experience a severe erosion of the preferential margins they enjoy under the EPA; ACP exports equal 873 thousand t, vs. 809 thousand t in the "Base 2013" scenario (the one with no EPA and no WTO agreement) and 1,459 thousand t in the

most favourable scenario (this is scenario one, when the EPA are in place and the EU MFN tariff remains unchanged at 176 €/t). Banana export revenue in ACP countries is now 15.1% higher than in the "Base 2013" scenario, but 61.4% lower than in the scenario where the EPA are implemented and no agreement comes out from WTO negotiations.

The market equilibrium in the sixth scenario is very close to that obtained in the third one, as the EU applied tariff remains unchanged (176 €/t) and only the tariffs applied by the U.S. and the other net importing countries are further reduced, to 0.2% and 6.4%, respectively (in scenario three they are 0.3% and 9.8%). Finally, in the seventh scenario, when the EU applied tariff is reduced to 59.8 €/t, the results obtained are between those in scenarios four and five. EU imports equal 4.892 million t and MFN and ACP exports to the EU equal 3.821 and 1.072 million t, respectively.

4. Sensitivity analyses

As is always the case, the results of a modelling exercise depend, at least to a certain extent, on the quality of the information used and on the assumptions made. The main issues to be aware of when considering the results of this study are: the quality of the data available; the assumption that all actors involved in banana trade – i.e. countries as well as multinationals involved in banana production and trade and large retail agglomerations – behave competitively; the assumption that bananas are a homogeneous product (which, among other things, means ignoring the growing importance of "Fair trade" and organic bananas); the assumption that banana producers in France and Spain are risk neutral, or are risk averse but operate under no uncertainty; 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).

In order to assess the robustness of the results obtained to some of the assumptions made regarding the parameters of the model, sensitivity analyses have been performed with respect to those which appear among those potentially more critical: (i) the €/$ exchange rate; (ii) the price

responsiveness of banana exports in ACP countries; and (iii) the extent of production increases over time due to technical changes. The sensitivity analyses have been conducted for all the scenarios considered in the previous section; they are intended to provide the reader with a sense of "to what extent" and "in which direction" the results presented above would change if different assumptions were made with respect to the parameters considered.

In the simulations presented above the €/$ exchange rate in 2013 is assumed to be 1.5 (in the "Base 2005" model it was 1.2441); two alternative values have been considered to test the sensitivity of the results to this parameter: 1.7 and 1.3 . Changes in the exchange rate modify the competitiveness of EU imports *vis a vis* domestic production and effect the price of bananas in the EU market; a higher exchange rate increases the competitiveness of EU imports and lowers the price, while a lower exchange rate, on the contrary, makes imported bananas less competitive on the EU market and the price of bananas in the EU increase. When the results obtained (Tables 3 and 4) are compared with those presented in Table 2, the differences appear relatively small. For example, in the two extreme policy scenarios - scenarios one (EPA only) and five (full liberalization) - when the €/$ exchange rate is 1.7 EU imports are larger by 3.9% and 3.6% and ACP and MFN exports to the EU by 6.5% and 1.0%, and by 2.7% and 4.1%, respectively; when the exchange rate is set equal 1.3 EU imports are lower by 5%, and 4.6%, and ACP and MFN exports to the EU by 6.6% and 1.2%, and by 1.3% and 5.3%, respectively.

The sensitivity of the results obtained to the assumptions made with respect to the elasticity of the export supply functions in the ACP countries has been assessed by lowering those of Ivory Coast and Cameroon (these two countries alone account for almost 60% of ACP banana exports) from 1.5 to 1, to make their exports less price responsive (Table 5). The results obtained under all policy scenarios are relatively robust with respect to these changes; in scenarios one and five, for example, ACP exports to the EU are lower by 0.1% and higher by 5.4% , respectively.

Finally, the sensitivity of the results presented in section 3 to the assumptions made regarding expected technical developments in banana production between 2005 and 2013 has

been assessed by imposing a 2% maximum constraint on yearly yield increases; this meant using for Cyprus, Ivory Coast, Dominican Republic, Other ACP non-LDC countries, and Guatemala, and, among the importers, in the Rest of the world, a per cent yearly yields increase lower than the one observed between 92-95 and 02-05. In this case results appear to be sensitive to the assumptions made. Among the exporters the main impact is a significant reduction in the competitiveness of ACP banana exports *vis a vis* those from MFN countries (Table 6); the reduction in the rate of adoption of technical changes among the net importers aggregated in the "Rest of world" makes their import demand function expand significantly. In the two extreme policy scenarios considered, scenarios one and five, EU imports are lower with respect to those in the simulation presented in the previous section by 2.3% and higher by 3.6%, respectively, and Rest of the world imports are higher by 14.2% and 15.2%; ACP exports are lower in scenario one by 39.3% and in scenario five by 55.7%, while total MFN exports are higher by 8.2% and 8.3%.

5. Conclusions

The goal of this paper was twofold: to provide a quantitative assessment of the impact on the banana market (a) of the expansion in trade preferences the EU granted to ACP countries with the EPA and (b) of the erosion of these preferences implied by different possible endings, if any, of the DDA round or by the positive conclusion of current negotiations between the EU and MFN exporters to find a commonly acceptable solution allowing for the conclusion of the DDA round and putting an end to the "Banana III" WTO dispute.

The results of the simulations performed suggest the EPA will have only a minor impact on the EU domestic market for bananas, while the impact on the composition of EU imports by origin will be significant. As a result of the EPA, ACP exports are forecast to increase by 80% (from 809 to 1,459 thousand t) at the expense of MFN exports, which decline by 3.8% (from 12.3 to 11.8 million t; MFN exports to the EU decline by 17.1%). A reduction of the MFN tariff to 94 €/t would be needed, everything else held constant, to leave MFN exports unchanged with

respect to the situation without the implementation of the EPA (while ACP exports would remain well above the level with no EPA).

A successful conclusion of the DDA round could have, at one extreme, no impact or, at the other extreme, a very significant one on the erosion of the preferences the EU grants to ACP countries, depending on what will be eventually agreed. If the EU bound tariff to be reduced is assumed to be equal to 680 €/t (as could be legitimately claimed by the EU) and bananas are either not included among "tropical products", or are included and provisions for these products in the final agreement only call for a tariff reduction by the largest percentage applied to agricultural products in each country, then ACP countries would actually benefit from the agreement, although these benefits are forecast to be small; this is so because the EU applied tariff on MFN imports would not change while the other importers will have to lower their market protection and this would induce an increase in export prices worldwide and a contraction of the MFN export supply to the EU market. At the other extreme, if bananas are included among "tropical products" and the final agreement of the DDA round calls for the elimination of all import restrictions for these products, then most of the benefits to ACP countries from the EPA would vanish; in fact, ACP exports are now forecast to be higher than in the no-EPA scenario by a mere 6.5%, rather than by 80% when the EPA are in place and there is no agreement of any sort at the WTO.

While these conclusions appear robust to changes in a number of the assumptions made, they are relatively sensitive to the hypotheses made with respect to expected changes in yields. Because ACP exporters are less efficient in producing and marketing bananas than MFN ones, this suggests that aid targeted at improving efficiency in banana production in ACP and LDC countries may be as beneficial as granting them preferential market access and that the negative effects of preference erosion can be offset by providing preferred developing countries with the financial and in-kind resources needed to improve the relative market competitiveness of their bananas by enhancing their technical efficiency in production and their logistic infrastructures.

Nevertheless, the results presented in this paper confirm the importance of the benefits to be accrued by ACP countries on the banana market from the implementation of the EPA (at the expense of MFN exporters) and provide quantitative evidence on the effects of the preference erosion associated to different hypotheses with respect to the conclusion of on-going WTO negotiations.

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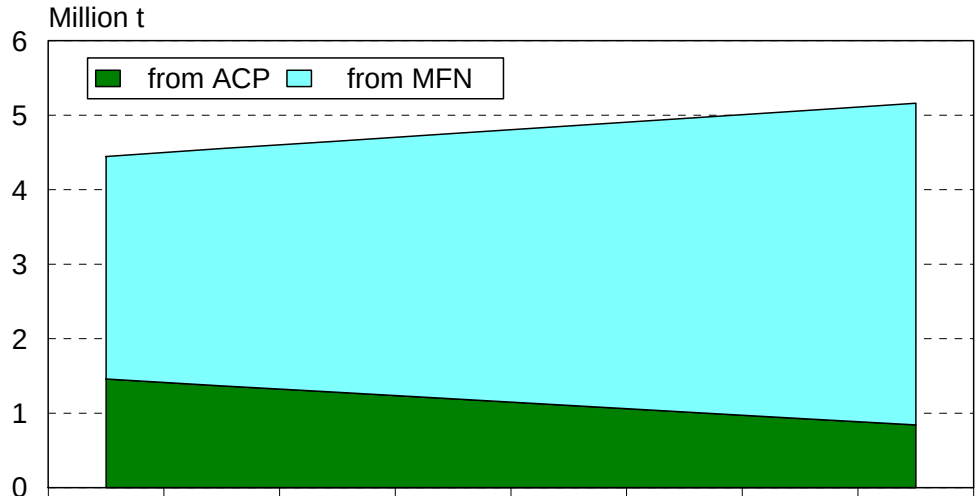
Figure 1 - EU-27 banana imports (in total and by origin) as a function of the MFN tariff (2013; EPA in place, no DDA round agreement).



	176	150	125	100	75	50	25	0
Total Imports	**4,447**	**4,552**	**4,653**	**4,754**	**4,855**	**4,957**	**5,058**	**5,16**
from MFN	***2,987***	***3,184***	***3,372***	***3,561***	***3,75***	***3,94***	***4,129***	***4,318***
from ACP	***1,459***	***1,368***	***1,28***	***1,193***	***1,105***	***1,017***	***0,929***	***0,842***

Table 1 - Base model input data and model calibration (2005).

Country/Region	Base Net Imports[1] (000 t)	*Estimated Net Imports (000 t)*	*% Difference*	Base Net Exports[2] (000 t)	*Estimated Net Exports (000 t)*	*% Difference*	Import Prices ($/t)	Export Prices[3] ($/t)	Export Supply Price Elasticities	Import Demand Price Elasticities	Domestic Demand Income Elasticities	% Yearly Yield Changes[4]	% Yearly Population Changes	% Yearly Per Capita GDP Changes[5]
EU-15	4103,9	*4364,7*	*6,4*				703,1			-0,50	0,5		0,4	1,19
EU-10	209,3	*221,4*	*5,8*				773,4			-0,75	0,9		-0,2	4,27
Bulgaria and Romania	49,4	*47,7*	*-3,4*				611,2			-0,80	1,0		-0,7	7,28
USA	3881,6	*3858,2*	*-0,6*				411,6			-0,40	0,4	1,79	1,0	1,85
Rest of the world net importers	4790,8	*4728,6*	*-1,3*				533,2			-0,80	0,5	3,25	0,8	3,46
Spain				384,0	*384,0*	*0,0*		957,5	1,0			0,04		
France				308,5	*308,5*	*0,0*		607,0	1,0			0,00		
Portugal				18,8	*18,8*	*0,0*		757,3	1,0			0,00		
Greece				2,8	*2,8*	*0,0*		667,8	1,0			0,00		
Cyprus				8,9	*9,0*	*1,1*		485,6	1,0			2,42		
Ivory Coast				196,6	*176,8*	*-10,1*		565,6	1,5		0,5	5,00	1,6	-1,98
Cameroon				245,8	*256,1*	*4,2*		416,0	1,5		0,5	0,00	1,9	1,94
Dominican Republic				152,9	*146,8*	*-4,0*		518,5	1,0		0,5	5,00	1,5	0,60
Belize and Suriname				111,0	*105,1*	*-5,3*		493,8	1,0		0,5	1,87	1,6	0,63
Other ACP non LDC				59,6	*57,1*	*-4,2*		467,1	1,0		0,5	4,77	1,7	2,62
ACP LDC				8,1	*8,1*	*0,0*		369,9	1,0		0,5	0,00	2,3	3,10
Ecuador				4084,8	*4209,2*	*3,0*		308,5	1,3		0,5	1,95	1,5	3,69
Colombia				1379,4	*1364,2*	*-1,1*		328,5	1,3		0,5	0,00	1,6	1,94
Costa Rica				1589,7	*1659,0*	*4,4*		321,7	1,0		0,5	1,65	1,9	2,15
Panama				322,5	*332,2*	*3,0*		345,3	1,0		0,5	0,00	1,8	2,58
Honduras				468,0	*477,6*	*2,1*		301,6	1,5		0,5	0,00	2,3	1,30
Brazil				211,9	*212,7*	*0,4*		244,8	1,0		0,5	1,58	1,4	0,80
Guatemala				1121,6	*1112,3*	*-0,8*		267,2	1,5		0,5	5,00	2,4	0,10
Other MFN exporters non LDC				2305,5	*2317,7*	*0,5*		363,8	1,0		0,5	1,18	1,5	1,07
LDC non-ACP exporters				60,9	*62,5*	*2,6*		249,0	1,0		0,5	0,00	2,1	3,49

[1]: For EU-15 and EU-10 apparent consumption (imports + domestic production - exports).

[2]: For Spain, France, Portugal and Greece average production in 2002-2006.

[3]: For Spain, France, Portugal and Greece official farm gate prices, including compensatory aid; for Cyprus it is the official farm gate price. The average unit value of exports of Panama from FAO was unrealistacally high compared with values for other countries in the region and average unit values based on the COMTRADE database; it has been adjusted based on the differences in average unit values for exports of countries in the region calculated using COMTRADE.

[4]: Percentage changes below 0 and above 5 have been set equal to 0 and 5, respectively.

[5]: For Belize and Suriname this is the 2004/2005 annual rate of change due to lack of data for the period 2000/2005.

Table 2 - Simulation results (2013).

	Base 2013 (no EPA, no DDA)	EPA						
		no DDA round agreement		DDA round agreement				
						Bananas included among "tropical products"		
		no EU-MFN countries agreement	EU-MFN countries agreement: t = 110 €/t	EU bound t = 680 €/t and EU tariff reduction -66%	EU bound t = 176 €/t and EU tariff reduction -55%	all t = 0	tariff reduction -66% and EU bound t = 680 €/t	tariff reduction -66% and EU bound t = 176 €/t
		EU t_{MFN}=176 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=110 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=176 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}=79.2 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}= 0 €/t US t=0% ROW t=0%	EU t_{MFN}=176 €/t US t=0.2% ROW t=6.4%	EU t_{MFN}=59.8 €/t US t=0.2% ROW t=6.4%
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
EU-27 consumption (000 t)	**4992,4**	**5025,2**	**5289,1**	**5008,9**	**5395,5**	**5692,8**	**5002,6**	**5466,6**
EU-27 production (000 t)	**578,9**	**578,6**	**575,8**	**578,8**	**574,6**	**569,9**	**578,8**	**573,9**
EU-15 border price (€/t, tariff inclusive)	**517,8**	**510,3**	**450,3**	**514,0**	**426,2**	**358,6**	**515,5**	**410,0**
EU-27 imports (000 t)	**4413,4**	**4446,6**	**4713,4**	**4430,1**	**4820,9**	**5122,9**	**4423,8**	**4892,7**
from non-LDC ACP countries	***808,5***	***1459,2***	***1227,7***	**1473,6**	***1134,3***	***873,4***	***1479,1***	***1071,9***
from non-LDC MFN countries	***3605,0***	***2987,4***	***3485,7***	**2956,5**	***3686,6***	***4249,5***	***2944,7***	***3820,8***
from LDC countries	***0***	***0***	***0***	**0**	***0***	***0***	***0***	***0***
EU-27 tariff revenue (mill €)	**640,4**	**525,8**	**383,4**	**520,3**	**292,0**	**0**	**518,3**	**228,5**
USA imports (000 t)	**4227,3**	**4276,0**	**4236,7**	**4255,7**	**4197,5**	**4127,9**	**4248,4**	**4178,3**
Rest of the world net imports (000 t)	**4452,6**	**4550,9**	**4471,5**	**4836,5**	**4727,7**	**4968,6**	**4944,7**	**4817,7**
ACP countries, total exports (000 t)	**808,5**	**1459,2**	**1227,7**	**1473,6**	**1134,3**	**873,4**	**1479,1**	**1071,9**
ACP countries, export revenue (mill $)[1]	**314,9**	**937,7**	**678,4**	**955,1**	**585,6**	**362,3**	**961,8**	**527,4**
MFN countries, total exports (000 t)	**12284,8**	**11814,3**	**12193,9**	**12048,6**	**12611,8**	**13346,0**	**12137,9**	**12816,8**
MFN countries, export revenue (mill $)	**4427,5**	**4127,7**	**4368,8**	**4275,7**	**4624,2**	**5142,5**	**4332,8**	**4779,3**
LDC countries, total exports (000 t)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

[1]: in the "Base 2013" scenarios it does not include quota rents.

Table 3 - Sensitivity analysis, euro/US dollar exchange rate equal 1.7 (instead of 1.5).

	Base 2013 (no EPA, no DDA)	EPA						
		no DDA round agreement		DDA round agreement				
		no EU-MFN countries agreement	EU-MFN countries agreement: t = 110 €/t	EU bound t = 680 €/t and EU tariff reduction -66%	EU bound t = 176 €/t and EU tariff reduction -55%	Bananas included among "tropical products"		
						all t = 0	tariff reduction -66% and EU bound t = 680 €/t	tariff reduction -66% and EU bound t = 176 €/t
		EU t_{MFN}=176 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=110 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=176 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}=79.2 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}= 0 €/t US t=0% ROW t=0%	EU t_{MFN}=176 €/t US t=0.2% ROW t=6.4%	EU t_{MFN}=59.8 €/t US t=0.2% ROW t=6.4%
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
EU-27 consumption (000 t)	**5164,9**	**5197,9**	**5463,4**	**5183,4**	**5572,2**	**5873,4**	**5177,8**	**5636,2**
EU-27 production (000 t)	**577,8**	**577,4**	**574,6**	**577,6**	**571,9**	**568,0**	**577,6**	**571,1**
EU-15 border price (€/t, tariff inclusive)	**479,3**	**471,8**	**411,5**	**475,1**	**386,8**	**318,3**	**476,4**	**372,2**
EU-27 imports (000 t)	**4587,2**	**4620,5**	**4888,8**	**4605,8**	**5000,3**	**5305,5**	**4600,2**	**5065,1**
from non-LDC ACP countries	***816,2***	***1553,6***	***1289,6***	**1568,0**	***1181,3***	***881,8***	***1573,5***	***1117,7***
from non-LDC MFN countries	***3770,9***	***3067,0***	***3599,2***	**3037,8**	***3819,0***	***4423,7***	***3026,7***	***3947,4***
from LDC countries	***0,0***	***0,0***	***0,0***	**0,0**	***0,0***	***0,0***	***0,0***	***0,0***
EU-27 tariff revenue (mill €)	**670,9**	**539,8**	**395,9**	**534,6**	**302,5**	**0,0**	**532,7**	**236,1**
USA imports (000 t)	**4214,2**	**4269,7**	**4227,7**	**4249,2**	**4186,9**	**4113,9**	**4241,9**	**4153,1**
Rest of the world net imports (000 t)	**4426,1**	**4538,3**	**4453,5**	**4824,4**	**4708,0**	**4944,6**	**4932,9**	**4771,9**
ACP countries, total exports (000 t)	**816,2**	**1553,6**	**1289,6**	**1568,0**	**1181,3**	**881,8**	**1573,5**	**1117,7**
ACP countries, export revenue (mill $)[1]	**320,4**	**1055,3**	**743,6**	**1073,9**	**631,5**	**368,6**	**1081,0**	**569,8**
MFN countries, total exports (000 t)	**12411,1**	**11874,5**	**12280,4**	**12111,1**	**12713,9**	**13482,2**	**12201,4**	**12872,3**
MFN countries, export revenue (mill $)	**4509,9**	**4165,7**	**4424,7**	**4315,8**	**4710,2**	**5238,2**	**4373,6**	**4883,0**
LDC countries, total exports (000 t)	**0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

[1]: in the "Base 2013" scenarios does not include quota rents.

Table 4 - Sensitivity analysis, euro/US dollar exchange rate equal 1.3 (instead of 1.5).

	Base 2013 (no EPA, no DDA)	EPA						
		no DDA round agreement		DDA round agreement				
		no EU-MFN countries agreement	EU-MFN countries agreement: t = 110 €/t	EU bound t = 680 €/t and EU tariff reduction -66%	EU bound t = 176 €/t and EU tariff reduction -55%	Bananas included among "tropical products"		
						all t = 0	tariff reduction -66% and EU bound t = 680 €/t	tariff reduction -66% and EU bound t = 176 €/t
		EU t_{MFN}=176 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=110 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=176 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}=79.2 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}= 0 €/t US t=0% ROW t=0%	EU t_{MFN}=176 €/t US t=0.2% ROW t=6.4%	EU t_{MFN}=59.8 €/t US t=0.2% ROW t=6.4%
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
EU-27 consumption (000 t)	**4769,7**	**4802,3**	**5064,3**	**4783,7**	**5167,4**	**5459,8**	**4776,6**	**5237,0**
EU-27 production (000 t)	**580,5**	**580,1**	**577,3**	**580,3**	**576,2**	**573,1**	**580,4**	**575,5**
EU-15 border price (€/t, tariff inclusive)	**567,4**	**560,0**	**500,4**	**564,2**	**477,0**	**410,5**	**565,8**	**461,2**
EU-27 imports (000 t)	**4189,3**	**4222,2**	**4487,0**	**4203,4**	**4591,2**	**4886,7**	**4196,2**	**4661,6**
from non-LDC ACP countries	***798,5***	***1362,7***	***1163,5***	**1376,8**	***1085,0***	***862,7***	***1382,2***	***1032,1***
from non-LDC MFN countries	***3390,8***	***2859,5***	***3323,5***	**2826,5**	***3506,2***	***4024,1***	***2814,0***	***3629,5***
from LDC countries	***0,0***	***0,0***	***0,0***	**0,0**	***0,0***	***0,0***	***0,0***	***0,0***
EU-27 tariff revenue (mill €)	**600,9**	**503,3**	**365,6**	**497,5**	**277,7**	**0,0**	**495,3**	**217,0**
USA imports (000 t)	**4244,1**	**4286,1**	**4249,4**	**4266,0**	**4211,8**	**4146,1**	**4258,9**	**4193,6**
Rest of the world net imports (000 t)	**4486,7**	**4571,3**	**4497,4**	**4855,8**	**4754,6**	**4999,6**	**4963,7**	**4845,4**
ACP countries, total exports (000 t)	**798,5**	**1362,7**	**1163,5**	**1376,8**	**1085,0**	**862,7**	**1382,2**	**1032,1**
ACP countries, export revenue (mill $)[1]	**308**	**824,5**	**613,9**	**840,6**	**539,4**	**354,2**	**846,8**	**491,8**
MFN countries, total exports (000 t)	**12121,6**	**11716,9**	**12070,3**	**11948,4**	**12472,3**	**13169,7**	**12036,6**	**12668,6**
MFN countries, export revenue (mill $)	**4322,3**	**4066,9**	**4289,6**	**4212,1**	**4550,2**	**5020,1**	**4268,0**	**4679,9**
LDC countries, total exports (000 t)	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
LDC countries, export revenue (mill $)	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

[1]: in the "Base 2013" scenarios does not include quota rents.

Table 5 - Sensitivity analysis, Cameroon and Ivory Coast export supply price elasticity equal 1 (instead of 1.5).

	Base 2013 (no EPA, no DDA)	EPA						
		no DDA round agreement		DDA round agreement				
		no EU-MFN countries agreement	EU-MFN countries agreement: t = 110 €/t	EU bound t = 680 €/t and EU tariff reduction -66%	EU bound t = 176 €/t and EU tariff reduction -55%	Bananas included among "tropical products"		
						all t = 0	tariff reduction -66% and EU bound t = 680 €/t	tariff reduction -66% and EU bound t = 176 €/t
		EU t_{MFN}=176 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=110 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=176 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}=79.2 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}= 0 €/t US t=0% ROW t=0%	EU t_{MFN}=176 €/t US t=0.2% ROW t=6.4%	EU t_{MFN}=59.8 €/t US t=0.2% ROW t=6.4%
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
EU-27 consumption (000 t)	**4994,5**	**5022,8**	**5289,1**	**5008,9**	**5395,4**	**5694,6**	**5000,0**	**5466,9**
EU-27 production (000 t)	**578,9**	**578,6**	**575,8**	**578,8**	**574,6**	**569,9**	**578,9**	**573,9**
EU-15 border price (€/t, tariff inclusive)	**517,3**	**510,9**	**450,3**	**514,0**	**426,2**	**358,2**	**516,0**	**409,9**
EU-27 imports (000 t)	**4415,6**	**4444,2**	**4713,4**	**4430,1**	**4820,8**	**5124,7**	**4421,1**	**4893,0**
from non-LDC ACP countries	***851,3***	***1410,9***	***1227,7***	**1473,6**	***1131,4***	***907,1***	***1427,9***	***1077,8***
from non-LDC MFN countries	***3564,4***	***3033,3***	***3485,7***	**2956,5**	***3689,3***	***4217,6***	***2993,2***	***3815,2***
from LDC countries	***0,0***	***0,0***	***0,0***	**0,0**	***0,0***	***0,0***	***0,0***	***0,0***
EU-27 tariff revenue (mill €)	**640,8**	**533,9**	**383,4**	**520,3**	**292,2**	**0,0**	**526,8**	**228,1**
USA imports (000 t)	**4230,5**	**4272,3**	**4236,7**	**4255,7**	**4197,3**	**4130,5**	**4244,5**	**4178,8**
Rest of the world net imports (000 t)	**4459**	**4543,6**	**4471,5**	**4836,5**	**4727,3**	**4973,0**	**4937,7**	**4818,5**
ACP countries, total exports (000 t)	**851,3**	**1410,9**	**1227,7**	**1473,6**	**1131,4**	**907,1**	**1427,9**	**1077,8**
ACP countries, export revenue (mill $)[1]	**332,0**	**907,5**	**678,4**	**955,1**	**584,5**	**376,6**	**929,5**	**530,7**
MFN countries, total exports (000 t)	**12253,8**	**11849,3**	**12193,9**	**12048,6**	**12613,9**	**13321,,1**	**1217,5**	**12812,5**
MFN countries, export revenue (mill $)	**4407,5**	**4149,6**	**4368,8**	**4275,7**	**4643,5**	**5125,1**	**4356,9**	**4776,4**
LDC countries, total exports (000 t)	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

[1]: in the "Base 2013" scenarios does not include quota rents.

Table 6 - Sensitivity analysis, percent per year yield increases not to exceed 2%.

	Base 2013 (no EPA, no DDA)	EPA						
		no DDA round agreement		DDA round agreement				
						Bananas included among "tropical products"		
		no EU-MFN countries agreement	EU-MFN countries agreement: t = 110 €/t	EU bound t = 680 €/t and EU tariff reduction -66%	EU bound t = 176 €/t and EU tariff reduction -55%	all t = 0	tariff reduction -66% and EU bound t = 680 €/t	tariff reduction -66% and EU bound t = 176 €/t
		EU t_{MFN}=176 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=110 €/t US t=0.5% ROW t=18.9%	EU t_{MFN}=176 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}=79.2 €/t US t=0.3% ROW t=9.8%	EU t_{MFN}= 0 €/t US t=0% ROW t=0%	EU t_{MFN}=176 €/t US t=0.2% ROW t=6.4%	EU t_{MFN}=59.8 €/t US t=0.2% ROW t=6.4%
		[1]	[2]	[3]	[4]	[5]	[6]	[7]
EU-27 consumption (000 t)	**4920,3**	**4925,9**	**5194,5**	**4904,2**	**5297,7**	**5594,4**	**4895,9**	**5368,0**
EU-27 production (000 t)	**579,5**	**579,5**	**576,6**	**579,7**	**575,5**	**571,1**	**579,8**	**574,8**
EU-15 border price (€/t, tariff inclusive)	**534,2**	**532,9**	**471,9**	**537,8**	**448,4**	**381,0**	**539,7**	**432,4**
EU-27 imports (000 t)	**4340,8**	**4346,4**	**4617,8**	**4324,5**	**4722,1**	**5023,3**	**4316,1**	**4793,2**
from non-LDC ACP countries	***775,0***	***885,6***	***745,0***	**896,9**	***691,0***	***535,7***	***901,3***	***654,2***
from non-LDC MFN countries	***3565,8***	***3460,9***	***3872,8***	**3427,6**	***4031,1***	***4487,6***	***3414,8***	***4139,0***
from LDC countries	***0,0***	***0,0***	***0,0***	**0,0**	***0,0***	***0,0***	***0,0***	***0,0***
EU-27 tariff revenue (mill €)	**627,6**	**609,1**	**426,0**	**603,3**	**316,3**	**0,0**	**601,0**	**247,5**
USA imports (000 t)	**4120,3**	**4128,5**	**4096,1**	**4100,6**	**4052,5**	**3982,6**	**4090,5**	**4032,4**
Rest of the world net imports (000 t)	**5175,8**	**5196,2**	**5116,1**	**5554,8**	**5444,9**	**5767,1**	**5691,2**	**5562,7**
ACP countries, total exports (000 t)	**775,0**	**885,6**	**745,0**	**896,9**	**691,0**	**535,7**	**901,3**	**654,2**
ACP countries, export revenue (mill $)[1]	**473,6**	**604,8**	**440,7**	**619,2**	**384,5**	**244,1**	**624,7**	**348,4**
MFN countries, total exports (000 t)	**12861,9**	**12785,6**	**13085,1**	**13082,9**	**13528,4**	**14237,4**	**13196,6**	**13734,1**
MFN countries, export revenue (mill $)	**4969,1**	**4915,6**	**5127,2**	**5125,7**	**5448,6**	**5982,8**	**5207,1**	**5601,1**
LDC countries, total exports (000 t)	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

[1]: in the "Base 2013" scenarios does not include quota rents.