The 2006 Reform of the EU Domestic Policy Regime for Bananas. An Assessment of its Impact on Trade.*

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Abstract

The paper provides a quantitative assessment of the possible market implications of the December 2006 reform of the EU domestic policy regime for bananas. It is shown that, depending on implementation choices to be made at the member country level, the impact of the domestic policy reform on trade can be of a larger order of magnitude than that of the controversial "tariff-only" regime the EU introduced earlier in the same year. The simulations presented in this paper show that, *ceteris paribus*, if France, Portugal and Spain decide to decouple payments to their banana producers EU imports will increase by 13% and MFN exports to the EU by 16%; if they decide for a 2005 Memorandum-like option, EU imports still increase by 9% and MFN exports to the EU by 11%.

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The European Union (EU), with more than 30% of total imports in 2005, is the largest world importer of bananas, (the US is the second) and the 18th largest producer. Banana production in the EU is concentrated in the French Overseas Departments (Martinique and Guadeloupe) and Spain (Canary Islands), but production also takes place in Portugal (Madeira, Azores and in the continental area), Greece (Crete) and Cyprus. Domestic production is around one sixth of domestic consumption, with imports from MFN and preferred African, Caribbean and Pacific (ACP) countries accounting for two thirds and one sixth of the EU market, respectively. Bananas account for an important share of export revenue in all major exporting countries; it is close to 20 per cent in Ecuador and around 10 per cent in Costa Rica, Guatemala, Honduras and Panama.

On 1 January 2006 the EU introduced a new import regime for bananas, removing the quota for imports under MFN conditions, setting the MFN tariff equal to 176 €/t and expanding the duty-free quota reserved for imports from ACP countries from 750,000 to 775,000 t. In addition, from 1 January 2006 the Everything But Arms (EBA) initiative, which allows least developed country exports quota- and duty-free access to the EU market, has been fully implemented for bananas.

In December 2006 the EU approved a reform of its domestic policies for bananas. The previous Common Market Organization (CMO) regime for bananas 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 reform cancelled the CMO for bananas. For banana producing areas outside the "outermost regions" (Greece, Cyprus and continental Portugal) support (4.6 million €) has been fully decoupled and included in the "Single Farm Payment" (SFP) introduced by the June 2003 Fischler reform of the CAP. For the "outermost regions" (France, Spain, Azores and Madeira) 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 the POSEI programmes;

these programmes finance the use of a wide range of policy instruments, whose aim is to increase the competitiveness of agricultural production in these "disadvantaged" regions. The decision on which ones to implement is left to the individual member country. Feasible actions under the POSEI programmes will now include direct payments to banana producers.

The goal of the paper is to provide a quantitative assessment of the possible impact on trade of this radical change in the EU domestic policy regime for bananas. The next section presents the structure of the model, the data used and the assumptions made. In section two the results of the simulations performed are presented. Section three 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, and section four concludes.

1. The model

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

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 and Azores),[1] Greece (Crete) and Cyprus.

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 produced quantities and

[1] Banana production in continental Portugal is negligible and has been ignored.

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 (Anania 2006).

The base model time reference is 2002. The representation of the EU-15 import regime in 2002 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%; 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 2013, when the reform of the CMO is to be fully implemented in all countries[3] and it is 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.

The 2002 base model has been "extended" to 2013:

[2] The results of the sensitivity analyses are presented in section 3.
[3] In Cyprus the full implementation of the reform will take place in 2013.

(a) by modelling the 2004 enlargement of the EU-15 to the 10 new member states;[4]

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

(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 1.25.[5]

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 to them the import regime in place in the EU-15.

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 176 €/t 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.[6] Consumption has been assumed to vary 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[7] between 1991-1993 and

[4] The 2007 enlargement to Bulgaria and Romania has been ignored in this exercise.
[5] 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 remain constant).
[6] FAOSTAT is the source used for production and consumption in 2002.
[7] The source is FAOSTAT.

2000-2002.[8]

With respect to the developments in the WTO Doha Development Agenda round of negotiations, it is assumed that no agreement is reached.

2. The Reform of the EU Common Market Organization for Bananas

Because of the nature of the POSEI programmes, the reform gives ample flexibility to Spain, France and Portugal in the use of the conspicuous resources which have been added to those available under these schemes (EC 2006). At this point in time, it is impossible to make assumptions on the specific measures financed by Spain, France and Portugal with the resources transferred into their POSEI programmes; this means that an *a priori* assessment of the impact of the December 2006 reform of the CMO for bananas is impossible. What can be done instead is to simulate the expected market impact of different scenarios, assessing what may happen depending on the policy decisions countries make. Three alternative policy choices by France, Portugal and Spain all feasible within the POSEI framework, are considered (all scenarios assume full decoupling of support in Greece and Cyprus):

(a) a "*Status quo*" scenario, in which France, Portugal and Spain use all financial resources to provide banana producers in their "outermost regions" with fully coupled support analogous to that which they enjoyed under the previous policy regime;

(b) a "*Full decoupling*" scenario, in which all financial resources are used to provide banana producers with direct payments fully decoupled from production; and

(c) a "*Memorandum*" scenario, based on a joint proposal put forward in September 2005 by Cyprus, France, Portugal and Spain:

[8] 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). 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.

(i) in France and Spain 60% of financial resources are devoted to decoupled payments, but in order to receive them producers are required to produce at least 70% of what they produced, on average, in the 2000-2004 period; the remaining 40% is devoted to other policy interventions, some of these possibly extending beyond the boundaries of the banana sector;

(ii) in Madeira and Azores all financial resources are devoted to a fixed (rather than variable, as in the "deficiency payment" scheme in place in the pre-2007 regime) fully coupled production subsidy.

A scenario with no policy change whatsoever with respect to the pre-2007 policies is simulated to generate a reference for the assessment of the impact of the three policy choices considered.

"No policy change"

In this scenario no change in the domestic aspects of the CMO for bananas takes place; only changes in market access conditions and expected developments in demand and supply functions between 2002 and 2013 are simulated.

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 only in those countries where the price is lower than the average EU price by more than 10%.[9] In the model both "basic" and "supplementary" direct

[9] Supplementary aid payments in the 2000-2005 period were between 1.7 million € in 2001 and 43.1 in 2005.

payments are subject to the "stabilization" mechanism which was part of the pre-2007 CMO.[10] Production decisions are assumed not to react to cuts in "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, there will be no reduction in aid).

Payments are assumed not to be subject to reductions as a result of the "budget discipline" constraint. "Modulation" does not apply to payments to producers in "outermost regions", which account for about 98% of EU domestic production of bananas, and has been ignored in the simulations.

In September 2002 negotiations started to replace by 2008 the Cotonou agreement between the EU and ACP countries with a set of Economic Partnership Agreements (EPA) between the EU and six regional aggregations of the ACP countries, with preferences extending to all trade and becoming reciprocal, essentially creating free trade areas between the EU and each of the six sets of countries; this would mean allowing ACP countries to export bananas to the EU quota- and duty-free. In this reference scenario EPA are assumed not to have been implemented by 2013.

Under a continuation of the policies in place in 2006, banana consumption in the EU-25 in 2013 is expected to reach 6 million t and domestic production and imports to be 1,034 and 4,976 thousand t, respectively (table 3). Even if the relevant farm price (market price + deficiency payment) does not change, domestic production will increase over time because of increasing yields in Cyprus, France and Spain (table 2) and exceed the 854,000 t threshold which "triggers" the financial stabilizer mechanism (cuts in aid payments to be applied in Cyprus, France and Spain).

[10] If total domestic banana production exceeds the sum of the maximum guaranteed volumes in each of the producing countries (867,500 t), then a cut in the volume of bananas on which the payments are made is applied 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.

Imports from ACP countries equal the duty-free 775,000 t quota; those from MFN countries equal 4.103 million t, those from EBA countries 98,000 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 forecasted reduction in market prices, and, as a result, of the increase in the per unit "basic" aid, which in the 2002 was equal to 303.3 €/t and is simulated to reach 419.8 €/t in 2013.[11] Total EU budget expenditure (i.e. the budget expenditure for both "basic" and "supplementary" aid payments) equals 373.3 million €, well above CMO budget costs observed in the past.[12]

Tariff revenue, on the contrary, is now much higher than under the pre-2006 import regime, when imports from MFN countries were subject to a binding quota and a lower tariff (75 €/t) was imposed; it increases from less than 200 million € before 1 January 2006 to 722.1 .

"Status quo"

In this scenario no change in the domestic aspects of the CMO for bananas takes place in France, Portugal and Spain, while support is fully decoupled in Greece and Cyprus.

The "supplementary" aid is eliminated, and France, Portugal and Spain use all financial resources for the "basic" aid. The per unit payment to banana producers is calculated as the difference between the given reference price (unchanged with respect to the previous regime) and the domestic market price. Farms in Greece and Cyprus are assumed to satisfy cross-compliance conditions at no extra cost.

The financial stabilizer mechanism is now assumed to guarantee that budget expenditure does not exceed the financial resources which the 2006 reform added to the budget of each country's POSEI programme (129.1 million € in France, 8.6 in Portugal and 141.1 in Spain). If expected expenditure in one of the three countries exceeds the financial allocation, then the per unit "basic" aid is reduced in order to make total subsidy expenditure equal the financial allocation. Again, production decisions are assumed to be independent of the financial stabilization mechanism.

[11] In the 2000-2005 period the per unit "basic aid" varied between 382.9 €/t in 2000 and 59 €/t in 2005.
[12] In the 1994-2005 period it exceeded 300 million € only in 2000 when it was equal to 301.9 million €.

If France, Portugal and Spain decide not to change the policy support granted to their banana producers in their "outermost regions", the reform of the CMO for bananas will bring very little change (table 3; figure 1). The main impact will be through the reduction in banana production in Cyprus and Greece as a result of the decoupling of support. However, because of the small amount of bananas being produced in these two countries with respect to that produced in the Canary Islands, Guadalupe, Martinique, Madeira and the Azores, this change will have a very small market impact. If in 2013 the Economic Partnership Agreements are not implemented, then EU domestic price will increase and consumption decline marginally. The small increase in imports (26 thousand t) comes almost entirely from MFN countries (ACP exports are constrained by the TRQ and EBA exports increase by a negligible amount). The most significant change is in EU budget expenditure, which is now equal to the amount decided with the reform (283.4 million €) while it is forecasted to increase to 373.3 million € if there is no reform of the policy regime.

If EPA are implemented by 2013 (and banana trade is not excluded from the free trade areas which will be created), then ACP exports will enter the EU market duty- and quota-free, as those from EBA countries already do, and will displace part of MFN and EBA exports in the EU market. The impact of the implementation of EPA on the EU market simulated by the model is minimal, while its effects on trade are significant. In fact, when ACP bananas are assumed to enter the EU duty-free and without any quantitative restriction, EU production remains unaffected (in France, Portugal and Spain production depends on the domestic policy regime only) and imports increase only marginally, but MFN exports decline by 144,000 t[13] and ACP exports increase by 152,000 t . EU tariff revenue declines with respect to the scenario in which the EPA are not implemented as a result of the lower imports from MFN suppliers.

"Full decoupling"

Under this scenario in all countries both "basic" and "supplementary" aid payments in the pre-2006 policy regime are removed and replaced by direct payments to farms fully "decoupled" from the

[13] EBA exports decline as well, by 800 t.

quantity of bananas produced, analogously to those introduced in other sectors with the Fischler reforms of the Common Agricultural Policy.[14]

The costs of maintaining uncultivated land in good agronomic conditions or of satisfying "cross-compliance" requirements are assumed to be negligible.

Everything else held constant, the decoupling of support is expected to induce a sharp reduction in banana production in the EU, while the impact on farm incomes may be either positive or negative. This is so because, on the one hand, decoupled payments now equal 283.4 million €, well below those farmers would have received under the previous regime (373.3 million €), but, on the other hand, they now produce only what is profitable at market prices (in the "No policy change" scenario domestically produced bananas are sold on the market at a price below the marginal cost of production).

In this scenario, if EPA are assumed not to be implemented, EU production is forecasted to equal in 2013 351 thousand t (in the same year under the "Status quo" option it is forecasted to exceed one million t) (table 3). EU banana consumption is only slightly below the level under the reference scenario and the "Status quo" option, as domestic price increases by one per cent only. Increased imports (+ 650 thousand t, +13.1% with respect to the "No policy change" reference scenario) replace in EU consumption the marked reduction in domestic banana production. The small increase in the EU market price drives up prices worldwide and US imports and "Rest of the world" net imports decline by 1.3% and 1.9%, respectively. If it is assumed the EPA are not implemented, the benefits from the reform of the EU domestic policy regime for bananas for exporters are limited to MFN and EBA countries; ACP exports are still competitive on the EU market only and remain constrained by the duty-free TRQ (the quota rent increases with respect to the "No policy change" scenario from 47.5 $/t to 56 $/t). MFN exports are now 4.749 million t[15] , 646,000 t above the level forecasted when no policy change is assumed (table 3; figure 1).

[14] The June 2003 reform of the CAP decoupled support for arable crops, dairy products and meats; later direct payments for olive oil, tobacco, cotton, and sugar have also been decoupled and included in the "Single Farm Payment".
[15] Total MFN exports increase by a smaller amount (538,000 t), as some of the increase in exports to the EU are exports

EU budget expenditure is well below that expected under the "No policy change" scenario, while tariff revenue is higher with respect to both the reference and the "Status quo" scenarios, due to increased imports from MFN countries.

If EPA are assumed to be in place, the EU market equilibrium does not change significantly, while the distribution of imports between MFN and ACP suppliers does. MFN exports to the EU are forecasted to be lower than those which would occur under the same domestic policy scenario and no EPA by 165,000 t and ACP ones higher by 178,000 t.

"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 proposal the "basic" and "supplementary" aid payments were to be removed and replaced by different policy schemes in each country, within given financial envelopes. In the 2005 Memorandum total budget expenditure was suggested to be the highest yearly CMO budget expenditure in the 2000-2004 period (i.e. 302 million €, the expenditure in 2000). In the simulations the budget allocations are those decided with the December 2006 reform.

The different policy instruments applied in the different countries are modelled as follows:

(a) in France and Spain 60% of the budget allocation 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 to produce at least the minimum volume of bananas needed for them to claim the entire amount of decoupled payments they are eligible for (decoupled payments in France and Spain are around 7,900 and 8,800 €/ha, respectively). In the 2005 Memorandum the remaining 40% of the envelope has been proposed to be devoted:

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previously directed elsewhere.

(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.

The impact on the banana market of the use of the remaining 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; however, the structure of the model does not allow us to simulate the extent of these effects. For the same reason the simulations ignore the effects of financial resources employed to support new farmers and the enlargement of existing farms.

(b) in Portugal 100% of the financial allocation is devoted to the introduction of a fully coupled production subsidy. The fixed per unit subsidy is given by the financial allocation divided by the average yearly production in 2000-2004; this yields a subsidy equal to 404.3 €/t. The subsidy expenditure cannot exceed Portugal's financial allocation; if production is such that expenditure would exceed the maximum expenditure allowed, the per unit subsidy is cut *pro rata* so that the expenditure equals the budget allocation.

(c) in Greece and Cyprus 100% of the financial allocation goes into fully decoupled farm payments.

The expected impact of this policy option is in-between those of the "Status quo" and "Full decoupling" scenarios.

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. 173 and 145 thousand t produced when farms, under the "Full decoupling" option, are free to produce what they

find profitable at market prices, and vs. 504 and 457 thousand t produced when in these two countries the pre-2007 policy regime is extended to 2013. In Portugal, where support is fully coupled, production equals 22 thousand t, while it is forecasted to equal 8 thousand t when it is decoupled. In Greece and Cyprus, where payments are decoupled in all three scenarios, the minor differences observed in the volume of bananas produced are driven by the small changes in the equilibrium price in the EU market.

EU domestic production is now 567.7 thousand t and imports equal 5,420 million t. MFN and EBA exports are between those in the "Status quo" and "Full decoupling" scenarios, while ACP exports remain equal to the volume of the TRQ (the only change is for the quota rent, which now equals 53.3 $/t).

In this case too the impact of the implementation of EPA shows almost entirely in the change in the composition of EU imports. MFN exports to the EU decline from 4,544 to 4,384 million t and ACP ones increase from 775,000 to 944,000 t (table 3; figure 1).

3. Sensitivity analyses

As is always the case when attempts are made to model the many forces at work 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);

e) the assumption that farmers in the EU make production decisions without taking into account expectations on possible cuts in coupled direct payments, when they are in place, as a result of financial stabilization mechanisms.

The assumption that the banana market is perfectly competitive seems particularly sensitive, despite the fact that it has been used in all analyses of policy issues in this market so far, that there is no definite evidence of multinationals exerting market power, and that the sign of the impact of the import regime introduced by the EU on January 1 2006 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?).

Were the assumption that when farmers make their production decisions they ignore possible cuts of coupled direct payments not to hold, the simulations would overestimate production in all EU countries in the "No policy change" reference scenario, and in France, Portugal and Spain in the "Status quo" scenario.

The sensitivity of the results generated by the model to the parameters used has been assessed with respect to those which appear potentially more critical:

(a) the €/$ exchange rate;

(b) the export supply elasticities in the main ACP exporters; and

(c) the demand price elasticity in the EU-15.

These simulations should provide the reader with a sense of "by how much" and "in which direction" the results presented above would change if different assumptions were made with respect to these parameters.

The sensitivity analyses have been conducted only for three of the seven scenarios considered above: the "No policy change" reference scenario and the "Status quo" and "Full decoupling" policy scenarios assuming that the EPA will have been implemented by 2013.

In the simulations presented above the €/$ exchange rate used is 1.25; two alternative values have been considered to test the sensitivity of the results to this parameter: 1.10 and 1.40 (table 4).

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. Everything else held constant, when the exchange rate is 1.40 imports are higher and domestic prices lower than those in the simulations presented in section 2; the opposite is the case when the exchange rate is set equal 1.10. When the results presented in table 4 are compared with those presented above, the differences appear relatively small. For example, when the €/$ exchange rate is 1.40 EU imports increase by 3.2% in the reference scenario, by 3.2% in the "Status quo" scenario and by 3.5% in the "Full decoupling" one; when the exchange rate is set equal 1.10 EU imports decline by 4%, 4.1% and 4.4%, 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 assuming those of Ivory Coast and Cameroon (these two countries alone account for two thirds of ACP banana exports) to be much less price responsive, being equal to 1 instead of 1.5 (table 5).

This assessment is specifically relevant for the results obtained when it is assumed that EPA are implemented and ACP banana exports can enter the EU market duty- and quota-free. In fact, the change in these two parameters is irrelevant for the simulations in the "No policy change" reference scenario, as ACP exports to the EU remain equal to the binding constraint they face; the only impact is the reduction of the quota rent from 47.5 to 25.6 $/t. When the other two scenarios are considered, the market equilibrium in the EU is only marginally affected by the marked change in the price responsiveness of the excess supply functions in Cameroon and Ivory Coast, while the composition of EU imports by supplier, as expected, appears to be relatively sensitive to the assumption made with respect to these parameters; in fact, both in the "Status quo" and in the "Full decoupling" scenarios ACP exports are lower (-10%) and MFN exports higher (+2%) by roughly the same amount in absolute terms (100,000 t).

Finally, the sensitivity of the results obtained to the assumption made on the price elasticity of the demand function in the EU-15 has been assessed by setting it equal to two extreme values, -0.2 and -0.8, instead of -0.5 (table 6). Under such extreme assumptions regarding the price responsiveness of banana consumption in the EU-25, its consumption and imports change significantly: under all three scenarios, when the demand price elasticity is -0.8 EU consumption and imports are above those when it is -0.5 by 320-330 thousand t; on the contrary, when the demand price elasticity is -0.2 EU consumption and imports are below those when it is -0.5 by 330-350 thousand t.

4. Conclusions

Because of the impossibility at this stage of making assumptions on the specific measures France, Portugal and Spain will decide to implement using the resources transferred to their POSEI programmes, an *a priori* assessment of the impact of the December 2006 reform of the CMO for bananas is impossible. What has been done in this paper is to simulate the expected market impact of different feasible policy choices on their part.

The "Status quo" scenario induces very little change, while the full decoupling of support is associated with the greatest impact on banana trade.

The "Full decoupling" of support to banana producers induces a sharp reduction in banana production in the EU, from 1 million to 350 thousand t; while consumption in the EU is only slightly below that in the "Status quo" scenario, EU imports (5.626 million t) are higher by more than 600,000 t. With EPA in place, both MFN and ACP exporters benefit from the slightly higher price and increased exports; without EPA, MFN exports increase, while ACP exports remain constrained by the quota. The impact of the "Memorandum" policy option remains between those of the "Status quo" and "Full decoupling" scenarios. Production in Spain and France equals 70% of production in 2000-2004, as farmers find it profitable to produce the minimum required to be eligible for decoupled payments; EU production and imports are now 567,700 and 5,420,000 t, respectively.

In all three scenarios, the question whether the EPA have been implemented or not in 2013 only affects the relative share of the EU market held by MFN and ACP countries (MFN exports are significantly higher and ACP ones lower if EPA are not in place), while EU consumption and imports remain relatively stable.

Sensitivity analyses with respect to some of the parameters of the model which are potentially more critical have been performed; the results of the simulations appear robust with respect to the assumptions made, as the changes in the simulation results appear to be not of an order of magnitude to modify their normative implications.

Available estimates of the trade impact of the introduction of the EU "tariff-only" import regime for bananas are much smaller than some of those presented in this paper for the reform of the EU domestic policy regime. Anania (2006) estimates that the introduction of the so-called "tariff-only" import regime on January 1 2006 will lead to an overall 9.9% increase in EU banana imports, while imports from MFN countries increase by 13.2% and those from ACP countries by 3.3%; Guyomard, Le Mouël and Levert (2006) estimate that the new import regime will increase EU imports by 5-6% and MFN exports to the EU by 11-13%, depending on the assumptions made. The simulations of the possible impact of the new EU domestic policy regime for bananas presented in this paper show that, *ceteris paribus*, if France, Portugal and Spain decide to decouple payments to their banana producers, EU imports will increase by 13% and MFN exports to the EU by 16%; if they decide for a 2005 Memorandum-like option, EU imports still increase by 9% and MFN exports to the EU by 11%.

Paradoxically, while the reform of the EU import regime for bananas has attracted much attention and generated considerable debate, very little interest seems to have been shown so far outside Europe to the reform of the EU domestic policies for bananas and its implications for trade.

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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 six 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.

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 six 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.

Table 3 - Simulation results (2013).

	No policy change	without EPA			with EPA		
		Status quo	Memorandum	Full decoupling	Status quo	Memorandum	Full decoupling
EU-25 production (000 t)	**1,034**	**1,006.1**	**567.7**	**350.7**	**1,006.7**	**567.7**	**346.7**
Spain	*457*	*457*	*286*	*145*	*457*	*286*	*144*
France	*504*	*504*	*235*	*173*	*504*	*235*	*171*
Portugal	*22*	*22*	*22*	*8*	*22*	*22*	*7*
Greece	*2*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*
Cyprus	*49*	*23*	*24*	*24*	*23*	*24*	*24*
EU-25 imports (000 t)	**4,976**	**5,002**	**5,420**	**5,626**	**5,010**	**5,428**	**5,638**
from MFN countries	*4,103*	*4,129*	*4,544*	*4,749*	*3,985*	*4,384*	*4,584*
from ACP countries	*775*	*775*	*775*	*775*	*927*	*944*	*953*
from EBA countries	*98*	*98*	*101*	*102*	*98*	*100*	*101*
USA imports (000 t)	**4,893**	**4,890**	**4,851**	**4,831**	**4,904**	**4,866**	**4,847**
Rest of the world net imports (000 t)	**2,373**	**2,371**	**2,342**	**2,327**	**2,381**	**2,353**	**2,339**
MFN countries, total exports	**11,369**	**11,390**	**11,735**	**11,907**	**11,271**	**11,603**	**11,769**
EU-25 border (cif) price (€/t)	**465.0**	**465.2**	**469.6**	**471.8**	**463.7**	**467.9**	**470.0**
EU-25 consumption (000 t)	**6,010**	**6,008**	**5,987**	**5,976**	**6,016**	**5,995**	**5,985**
EU-25 budget expenditure (mill €)	**373.3** (1)	**283.4**	**283.4**	**283.4**	**283.4**	**283.4**	**283.4**
Basic aid (€/t)	**419.8**						
Production subsidy in Spain (€/t) (2)		**308.8**			**308.8**		
Production subsidy in France (€/t) (2)		**256.3**			**256.3**		
Production subsidy in Portugal (€/t) (2)		**392.7**	**387**		**392.7**	**388**	
EU-25 tariff revenue (mill €)	**722.1**	**726.7**	**799.7**	**835.9**	**701.4**	**771.5**	**806.7**

(1) includes supplementary aid budget expenditure computed using the "standard formula".
(2) after reduction, if any, as a result of the financial stabilizer.

Table 4 - Sensitivity analysis, €/$ exchange rate (2013).

	No policy change			Status quo, with EPA			Full decoupling, with EPA		
	1 € = 1.25 $	1 € = 1.10 $	1 € = 1.40 $	1 € = 1.25 $	1 € = 1.10 $	1 € = 1.40 $	1 € = 1.25 $	1 € = 1.10 $	1 € = 1.40 $
EU-25 production (000 t)	**1,034**	**1,037**	**1,032**	**1,006.7**	**1,009.8**	**1,004.6**	**346.7**	**393.8**	**309.6**
Spain	*457*	*457*	*457*	*457*	*457*	*457*	*144*	*163*	*128*
France	*504*	*504*	*504*	*504*	*504*	*504*	*171*	*195*	*153*
Portugal	*22*	*22*	*22*	*22*	*22*	*22*	*7*	*8*	*7*
Greece	*2*	*2*	*2*	*0.7*	*0,8*	*0.6*	*0.7*	*0.8*	*0.6*
Cyprus	*49*	*52*	*47*	*23*	*26*	*21*	*24*	*27*	*21*
EU-25 imports (000 t)	**4,976**	**4,776**	**5,135**	**5,010**	**4,805**	**5,172**	**5,638**	**5,388**	**5,837**
from MFN countries	*4,103*	*3,914*	*4,251*	*3,985*	*3,883*	*4,047*	*4,584*	*4,439*	*4,680*
from ACP countries	*775*	*775*	*775*	*927*	*835*	*1,017*	*953*	*859*	*1,045*
from EBA countries	*98*	*87*	*109*	*98*	*87*	*108*	*101*	*90*	*112*
USA imports (000 t)	**4,893**	**4,911**	**4,879**	**4,904**	**4,914**	**4,898**	**4,847**	**4,861**	**4,838**
Rest of the world net imports (000 t)	**2,373**	**2,386**	**2,362**	**2,381**	**2,389**	**2,377**	**2,339**	**2,349**	**2,332**
MFN countries, total exports	**11,369**	**11,212**	**11,492**	**11,271**	**11,186**	**11,322**	**11,769**	**11,648**	**11,850**
EU-25 border (cif) price (€/t)	**465.0**	**502.1**	**435.4**	**463.7**	**501.7**	**433.5**	**470.0**	**508.4**	**439.4**
EU-25 consumption (000 t)	**6,010**	**5,814**	**6,167**	**6,016**	**5,815**	**6,176**	**5,985**	**5,782**	**6,146**
EU-25 budget expenditure (mill €)	**373.3** (1)	**341.6**	**398.2**	**283.4**	**283.4**	**283.4**	**283.4**	**283.4**	**283.4**
EU-25 tariff revenue (mill €)	**722.1**	**688.9**	**748.1**	**701.4**	**683.5**	**712.3**	**806.7**	**781.2**	**823.8**

(1) includes supplementary aid budget expenditure computed using the "standard formula".

Table 5 - Sensitivity analysis, price elasticity of the export supply functions in Cameroon and Ivory Coast (2013).

	No policy change		Status quo, with EPA		Full decoupling, with EPA	
	η = 1.5	**η = 1**	**η = 1.5**	**η = 1**	**η = 1.5**	**η = 1**
EU-25 production (000 t)	**1,034**	**1,034**	**1,006.7**	**1,006.7**	**346.7**	**349.7**
Spain	*457*	*457*	*457*	*457*	*144*	*145*
France	*504*	*504*	*504*	*504*	*171*	*172*
Portugal	*22*	*22*	*22*	*22*	*7*	*8*
Greece	*2*	*2*	*0.7*	*0.7*	*0.7*	*0.7*
Cyprus	*49*	*49*	*23*	*23*	*24*	*24*
EU-25 imports (000 t)	**4,976**	**4,976**	**5,010**	**5,005**	**5,638**	**5,630**
from MFN countries	*4,103*	*4,103*	*3,985*	*4,074*	*4,584*	*4,678*
from ACP countries	*775*	*775*	*927*	*833*	*953*	*851*
from EBA countries	*98*	*98*	*98*	*98*	*101*	*101*
USA imports (000 t)	**4,893**	**4,893**	**4,904**	**4,896**	**4,847**	**4,838**
Rest of the world net imports (000 t)	**2,373**	**2,373**	**2,381**	**2,375**	**2,339**	**2,332**
MFN countries, total exports	**11,369**	**11,369**	**11,271**	**11,345**	**11,769**	**11,848**
EU-25 border (cif) price (€/t)	**465.0**	**465.0**	**463.7**	**464.7**	**470.0**	**471.0**
EU-25 consumption (000 t)	**6,010**	**6,010**	**6,016**	**6,012**	**5,985**	**5,980**
EU-25 budget expenditure (mill €)	**373.3** (1)	**373.3**	**283.4**	**283.4**	**283.4**	**283.4**
EU-25 tariff revenue (mill €)	**722.1**	**722.1**	**701.4**	**717.0**	**806.7**	**823.4**

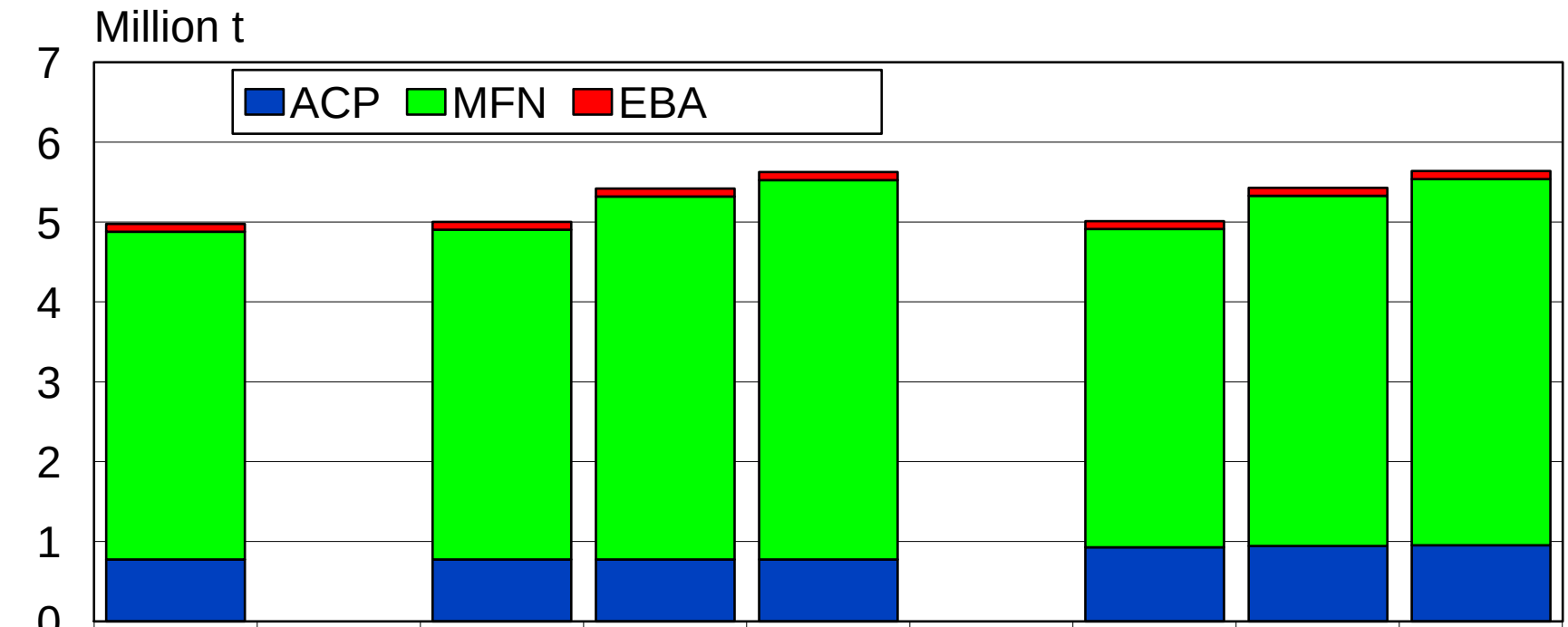
(1) includes supplementary aid budget expenditure computed using the "standard formula".

Table 6 - Sensitivity analysis, price elasticity of the EU-15 domestic demand function (2013).

	No policy change			Status quo, with EPA			Full decoupling, with EPA		
	η = - 0.5	η = - 0.2	η = - 0.8	η = - 0.5	η = - 0.2	η = - 0.8	η = - 0.5	η = - 0.2	η = - 0.8
EU-25 production (000 t)	**1,034**	**1,034**	**1,034**	**1,006.7**	**1,006.7**	**1,006.7**	**346.7**	**340.7**	**352.7**
Spain	*457*	*457*	*457*	*457*	*457*	*457*	*144*	*142*	*146*
France	*504*	*504*	*504*	*504*	*504*	*504*	*171*	*168*	*174*
Portugal	*22*	*22*	*22*	*22*	*22*	*22*	*7*	*7*	*8*
Greece	*2*	*2*	*2*	*0.7*	*0,7*	*0,7*	*0.7*	*0.7*	*0.7*
Cyprus	*49*	*49*	*49*	*23*	*23*	*23*	*24*	*23*	*24*
EU-25 imports (000 t)	**4,976**	**4,630**	**5,308**	**5,010**	**4,661**	**5,345**	**5,638**	**5,306**	**5,954**
from MFN countries	*4,103*	*3,758*	*4,433*	*3,985*	*3,652*	*4,305*	*4,584*	*4,268*	*4,886*
from ACP countries	*775*	*775*	*775*	*927*	*913*	*941*	*953*	*939*	*966*
from EBA countries	*98*	*97*	*100*	*98*	*96*	*99*	*101*	*99*	*102*
USA imports (000 t)	**4,893**	**4,926**	**4,861**	**4,904**	**4,936**	**4,874**	**4,847**	**4,877**	**4,818**
Rest of the world net imports (000 t)	**2,373**	**2,397**	**2,349**	**2,381**	**2,405**	**2,359**	**2,339**	**2,361**	**2,317**
MFN countries, total exports	**11,369**	**11,081**	**11,643**	**11,271**	**10,993**	**11,537**	**11,769**	**11,506**	**12,021**
EU-25 border (cif) price (€/t)	**465.0**	**461.3**	**468.4**	**463.7**	**460.2**	**467.1**	**470.0**	**466.7**	**473.2**
EU-25 consumption (000 t)	**6,010**	**5,663**	**6,342**	**6,016**	**5,666**	**6,352**	**5,985**	**5,649**	**6,307**
EU-25 budget expenditure (mill €)	**373.3** (1)	**376.4**	**370.3**	**283.4**	**283.4**	**283.4**	**283.4**	**283.4**	**283.4**
EU-25 tariff revenue (mill €)	**722.1**	**661.4**	**780.2**	**701.4**	**642.7**	**757.6**	**806.7**	**751.2**	**859.9**

(1) includes supplementary aid budget expenditure computed using the "standard formula".

Figure 1 - The impact of the reform of the EU CMO for bananas on its imports from MFN, ACP and EBA countries (million t, 2013)



	NPC		SQ	MEM	FD		SQ	MEM	FD
EBA	0,098		0,098	0,101	0,102		0,098	0,1	0,101
MFN	4,103		4,129	4,544	4,749		3,985	4,384	4,584
ACP	0,775		0,775	0,775	0,775		0,927	0,944	0,953
			Without EPA				With EPA		

Legenda: NPC: No policy change; SQ: Status quo; MEM: Memorandum; FD: Full decoupling.