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Modelling CAP Reform for the Mediterranean Countries - The Case of Tobacco, Olive Oil and Cotton

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Abstract

Last year the Mediterranean Member-States of the EU came across the reform of the CAP for three products tobacco, olive oil and cotton. In this paper a partial equilibrium model is used to simulate the impacts of decoupling, as a key point of the decided CAP Reform. Affected by this reform are almost only the south EU-countries and not the other EU-countries. Nevertheless, the introduction of the decoupled direct payments leads to welfare gains to the EU-15.

Keywords: Decoupling, partial equilibrium model, tobacco, olive oil, cotton

Introduction

In recent years the European Union has subjected its Common Agricultural Policy (CAP) to an immense reform process. The latest reform of the CAP was first discussed in 1999 in the Council of the Ministers of Agriculture in Berlin. The proposals of this Council, mostly known as "Agenda 2000" were limited to run until 2006 and were meant to be revised in 2003. In July 2002 the Commission published the Mid Term Review of the CAP, as a communication between the Commission and the European Council. This was not only a review of the situation in agriculture, but also involved new reform proposals. The proposals were revised and adopted in 2003 by the Council of Luxembourg, now known as the Luxembourg Agreement, providing the framework of agriculture in the European Union for the next 10 years.

The proposals for a reform of the three Mediterranean products, tobacco, cotton and olive oil, followed later, on September 2003 and were discussed and reviewed by the Council in April 2004. They were not included in the original proposals of 2002, because these products were coming from recent changes that had just been decided by the Council. For tobacco the pressure for an immediate abolition of support from the European Parliament was very intense

and the prolongation was agreed upon very positively by the producer countries. For cotton the Council had adopted a reform in 2001. For olive oil the prolongation of the regime was necessary since no producing country had prepared the olive oil registers and thus risking automatic reductions in support (Commission, 2004).

During this time researchers' interest in the impacts of the new CAP has been growing. Various analyses have been carried out with partial equilibrium models (European Commission, 2003; Binfield et al, 2003; Lips, 2004; FAA, 2002) and general equilibrium models, like GTAP (Brockmeier et al, 2003; Meijl et al, 2002). A common characteristic of the studies is the products they examine. They include the products of the Luxembourg Agreement, like milk, cereals, rice, beef, pork, poultry meat, but not the three Mediterranean products. Furthermore, they make predictions for either the EU as one region (Brockmeier et al 2003; European Commission, 2003; FAA, 2002; Lips, 2004), or special countries like Ireland (Binfield et al, 2003) or Netherlands (Meijl et al, 2003), but they do not refer explicitly to the Mediterranean member states of the EU. They also differ and thus give different results in the quantitative representation of the decoupling of direct subsidies.

This paper tries to analyse the impacts of the CAP Reform for the Mediterranean products with special focus on the Mediterranean member states of the EU. The decoupling of direct payments is expected to generate effects on the allocation of resources and the distribution of income in the EU and most of all in Greece, Italy and Spain as the most-affected EU member states. Special emphasis is given therefore to the theoretical implementation of the decoupled payments as the crucial point of the new CAP for these three commodities.

For this purpose the paper is organised in six parts. The second part briefly presents the political background of the Reform for the Mediterranean products, the existing regime and the introduced changes. The third and fourth parts deal with the theoretical analysis of the decoupled payments and how they can be modeled with a trade model respectively. The empirical results are presented in the fifth part. Last but not least, conclusions and suggestions for further research are drawn in the sixth part.

Political Framework

The reform of the Common Market Organizations (CMO) for olive oil and tobacco and of the support scheme of cotton is considered to be a follow-up of the Luxembourg Agreement and will enter into force in 2006. The objective is to provide a long-term perspective for these three sectors by promoting competitiveness, market-orientation and stable incomes for farmers. The proposed changes are based on the currently existing regimes for these sectors.

The raw tobacco market organization is set out in Council Regulation 2075/92 and the implementation rules are specified in the Commission Regulation 2848/98. The producers receive a premium subject to the production quotas allocated to them according to a guarantee threshold. The premium is comprised of 3 parts: A specific aid (25% of the premium), a variable part adjusted by the varieties group and the Member State and a fixed part, which is the difference between the premium after the deduction of the amount withheld for financing the

Tobacco Fund and the sum of the specific aid and the variable part. The Community grants a zero duty to imports from ACP countries and developed countries in the SPG system.

For olive oil the Council Regulation 1638/98 is applied. The Community sets out a production target price and thus determines the production aid that the olive growers receive. This is granted on the basis of the quantity of olive oil they actually produce. In order to ensure the budget expenditure of the Community, the aid is allocated according to the National Guaranteed Quantities (NGQ) and in case of lower or higher production than the NGQs a stabiliser mechanism is applied. The aid is distributed to the Producer Organisations and producers eligible for the aid are those registered in the olive cultivation register. No aid is provided for additional areas planted after 1 May 1998, with the exemption of plantings for the conversion of old olive plantations or new plantings covered by programmes approved by the Community. The areas and thus the olive cultivation register is based on data created by the Geographical Information System (GIS) and should correspond to this data. With respect to trade with third countries, almost all of the Community imports come from Tunisia, where an import quota of 53,000 tonnes in 2002 and 56,000 tonnes from 2006 is applied. This quota is expected to be abolished after 2010 with the implementation of the Euro-Mediterranean Free Trade Area.

The production aid for cotton is ruled by the Council Regulation 1051/2001. The producers receive aid per tonne of unginned cotton, equal to the difference between the world market price and the guide price. The latter is set by the Council and the former is determined by the Commission based on quotations in the international cotton fibre market. The aid is actually paid to the ginner, who are entitled to receive it as long as they provide a minimum price (95% of the guide price) to the producers. This support system is applied to a Maximal Guaranteed Quantity in the Community, which is divided to National Guaranteed Quantities and is subject to a stabiliser mechanism. In the case of excess production the guide price and thus the minimum price, is reduced and the aid is altered accordingly. As far as relationships with other countries are concerned, there are no custom duties, or import quotas, nor are there support measures for exports.

These producer aids, as described above, are examples of the application of deficiency payments and are classified in the Amber Box, not in the price support category but in the non-exempted direct payments category and therefore needed to be reconsidered. Taken also into account that no price cuts are necessary, the Commission's proposals concern only the decoupling of these direct payments and the introduction of a Single Farm Payment. The decoupled payments will be linked to environmental and food safety standards through cross-compliance and will be subject to the modulation and financial discipline mechanisms. Different approaches are proposed for each sector though, since they face different problems and there are differences in their long-term priorities (Commission, 2003a,b).

For olive oil a conversion of a minimum of 60% of the coupled payments for the reference period into entitlements to the single farm payment is decided. As a reference period for the calculation of the initial payments the four marketing years 1999/00-2002/03 will serve. 40% of the initial payments may be retained by the member states as an additional olive prove payment per hectare and will have the form of a national envelope. Current private storage measures will be kept as safety net mechanisms. Refunds for exports and for the manufacture of certain preserved food will be abolished (Council, 2004).

For tobacco the Council decided a gradual decoupling of the existing tobacco premium in parallel with the establishment of a financial restructuring envelope, within the second pillar of the CAP, to support a more sustainable policy for the sector in the future. A transitional period towards full decoupling is suggested from 2006 to 2010. During this period 40% of the current payment must be decoupled and a maximum of 60% can be maintained as coupled. The production quotas are kept in order to define the quantities that are entitled to receive the coupled payment. At the end of this period the aid for tobacco will be fully decoupled and 50% of it will be included in the single farm payment, 50% will be transferred to the restructuring envelope, whereas the current CMO will not apply (Council, 2004).

For cotton two types of payment are introduced: the single farm payment and a payment of eligible area per hectare of cotton, representing the decoupled and coupled part of the payment respectively. Member states must transfer 65% of the producer-support expenditure to the single farm payment and grant the other 35% as area payment. The eligible area is 370,000 ha for Greece, with a different amount of coupled aid (594 €/ha for the first 300,000 ha and 342.85 €/ha for the remaining 70,000 ha), 85,000 ha for Spain with coupled aid of 898 €/ha and 360 ha for Portugal with 556 €/ha as coupled payment. This area payment will be reduced proportionately if production exceeds the maximum area of the member state (Council, 2004).

The production for these three products is highly concentrated in certain regions, many of them lagging behind in economic development and employs a large proportion of the rural population. For example cotton is cultivated mainly in Greece in Thessaly, Macedonia-Thrace, Sterea Ellada and in Spain in Andalusia, Murcia and Valencia (Directorate-General for Agriculture, 2003). The main production areas of tobacco are the provinces of Macedonia-Thrace, Thessaly and west Sterea Ellada in Greece, Extremadura in Spain and Umbria, Campania, Aquitaine and Veneto in Italy (Commission, 2003c). Furthermore due to geographical constraints those areas do not offer many alternatives for other economic activities and for the cultivation of other crops which maybe more competitive. Therefore special consideration should be given to the impacts on these sectors of decoupling payments. Abandoning production due to decoupling for instance, would generate significant negative impacts for rural development.

Theoretical Background

This chapter focuses on the theoretical implications of decoupling direct payments and compares the impacts of so-called coupled and decoupled payments. The existing coupled payments were originally granted as compensation payments for price cuts in the MacSharry reform from 1992. This can be seen as a shift of subsidies from the actual quantity of a product produced to the actual product itself: for example, it is not the amount of wheat produced per hectare which determines the level of benefits for the farmer, but the cultivation of wheat. As a next step, the upcoming decoupling of payments – particularly in association with cross-compliance – shifts the payments from the single product to the whole agricultural production: for example, the planting of wheat does not qualify for a payment, but rather the cultivation of agricultural land. The market impacts of public payments to farmers are determined by the pro-

duction effects of payments. This applies to every mode of granting payments, i.e. both to coupled and to decoupled payments. Hence, the theoretical challenge for analysing decoupling is to define a pragmatic term of “production-effectiveness” of direct payments to work with and to analyze the production-effectiveness of coupled and decoupled payments.

Initially, the focus will be laid on the decision process about production. A farmer produces that product or that mix of products, which maximizes his profit. Coupled payments to single products per hectare or per animal can affect the relative competitiveness, if the possible profit of a product or a mix of products including direct payments exceeds the one of another product or product mix. In this case, direct payments affect production, but only as far as profits are the same for both products or both product mixes. All payments exceeding this profit value have no influence on production, because profit is maximized and there is no more incentive. If a possible profit does not exceed another profit, whether with or without direct payments, the whole payment will have no impact on production. So production-effectiveness can be defined as the share of direct payments to cause changes in the production structure compared to a situation without direct payments. The production-effectiveness varies between 0% and 100%. The direct payment can *ceteris paribus* be converted into an increase of the producer price, that leads to the same results for the produced quantity. Hence, a producer incentive price results from the farm gate price increased by the production-effective direct payment. With some differences in detail, this applies also for decoupled payment: a farmer will produce, if his agricultural profit exceeds alternative incomes. Acreage will be used for agriculture, if a possible product mix leaves a profit. Decoupled payments, which are only granted to active farmers, have a production-effectiveness greater than 0%, if they increase farmers profits or profits of acreage in such way as to rise agricultural production compared to a situation without coupled payments.

Building on these theoretical reflections, the next step is to analyze the impacts of coupled and decoupled payments on production on a market level.

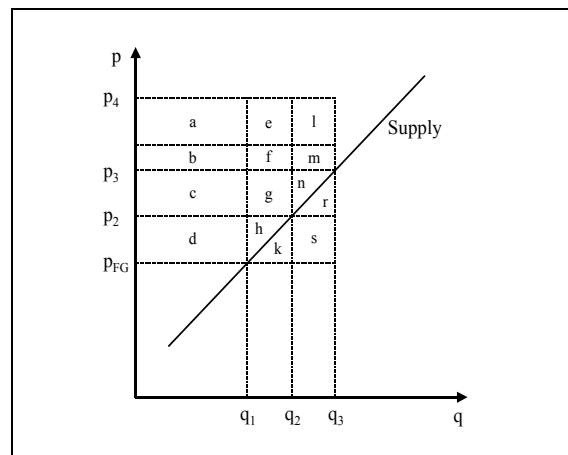


Figure 1. Impacts of different production-effectiveness of direct payments

Starting from a given farm gate price p_{FG} (Figure 1), a quantity q_1 is produced. In addition, a coupled direct payment is implemented and it amounts to the distance of $(p_4 - p_{FG})$ converted into a payment per unit. Assuming that there is no production-effectiveness of this payment, the producer incentive price equals the farm gate price p_{FG} and the produced quantity will not change. In this case, the granted payment tallies with the area $(a+b+c+d)$. In terms of welfare, this increase in government expenditure equals to the increase in producer surplus and the social welfare does not change. A decoupled direct payment with no production-effectiveness amounting to a fixed value equivalent to area $(a+b+c+d)$ yields the same results.

Assuming a low production-effectiveness of these coupled and decoupled payments, the producer incentive price rises to p_2 and quantity to q_2 . Assuming a high production-effectiveness, the producer incentive price rises to p_3 and quantity to q_3 . Fixing coupled payments at $(p_4 - p_{FG})$ per unit and decoupled payments equivalent to area $(a+b+c+d)$, which equals to the areas $(b+c+d+f+g+h+k)$ and $(c+d+g+h+k+n+r+s)$, the following welfare impacts will result using the case with no production-effectiveness as reference:

Coupled payments, low production-effectiveness:	Coupled payments, high production-effectiveness:
$\Delta \text{ producer surplus} = + (e+f+g+h)$	$\Delta \text{ producer surplus} = + (e+f+g+h+l+m+n)$
$\Delta \text{ budget} = - (e+f+g+h+k)$	$\Delta \text{ budget} = - (e+f+g+h+k+l+m+n+r+s)$
$\Delta \text{ social welfare} = - k$	$\Delta \text{ social welfare} = - (k+r+s)$
Decoupled payments, low production-effectiveness:	Decoupled payments, high production-effectiveness:
$\Delta \text{ producer surplus} = - a + (f+g+h)$	$\Delta \text{ producer surplus} = - (a+b) + (g+h+n)$
$\Delta \text{ budget} = + a - (f+g+h+k)$	$\Delta \text{ budget} = + (a+b) - (g+h+k+n+r+s)$
$\Delta \text{ social welfare} = - k$	$\Delta \text{ social welfare} = - (k+r+s)$

Thus, with equal producer incentive prices, the loss of social welfare of coupled and decoupled payments are the same. However, for decoupled payments, producer surplus and government expenditure are lower. Welfare losses rise with a higher production-effectiveness. The maximum producer incentive price is reached at the p_3 level for decoupled payments, because the sum of direct payments is fixed. In the case of coupled payments, p_4 is the maximum producer incentive price. Hence, the maximum impact of coupled payments on the total agricultural production is higher compared to decoupled payments.

Empirical Analysis – Model used and Implementation of Policy

An adjusted version of the world trade model AGRISIM is used for the empirical analysis. AGRISIM is a partial equilibrium, multi commodity, multi region model, comparatively static in nature, with non-linear supply and demand functions and constant elasticities. Policy interventions are considered as changes of nominal protections rate, price transmission elasticities,

minimum producer prices, production quotas and subsidies (direct, input and general), whereas through shift coefficients in the supply and demand functions additional variables can be simulated, like population and income growth (for more details see Pustovit, 2003; Schmitz, 2002). The world is grouped into 17 regions and the base version of the model includes 9 commodities: wheat, coarse grains, rice, oilseeds, sugar, milk, beef, pig meat and poultry meat. The database was recently updated for the year 2001. For the most important equations of AGRISIM see annex 1.

The adjustments of the model concern the regions and the commodities. AGRISIM is extended by the three commodities olive oil, tobacco and cotton. The regions are reorganized and in this version Greece, Italy, Spain and the rest of the Member States of the EU15 are modeled separately in order to extract the impacts of the agreed decoupled payments, as described above on those four countries/regions.

Further adjustments of the model were also made to analyze the effects decoupling according to the theoretical considerations presented above. First, the total sum of all decoupled payments is calculated. Dividing this total sum by the relevant total area, the decoupled payment per hectare is determined. The relevant total area consists of the area used for cereals including rice, oilseeds, sugar beet, sugar cane, cotton, olive oil, tobacco and of the forage area. For crops, the result is equivalent to the subsidy per production activity level. Dividing the result by the stocking density, the subsidy per production activity level is determined for the products of ruminants, i.e. milk and beef. Pig and poultry meat are assumed not to be directly affected by decoupled payments. Dividing the decoupled payment per production activity level for every product by its average yield, leads to a subsidy per unit of output. The impact on the producer incentive price for every product arises from the multiplication of this subsidy per ton by a specific multiplier for the production-effectiveness of direct payments. It should be noted that all subsidies in the model affect the producer incentive price.

The implementation of the decoupled direct payments for cotton, tobacco and olive oil is realised in 5 scenarios as shown in Table 1.

In the first scenario all direct payments for the initial products included in the Luxembourg Agreement, i.e. wheat, coarse grains, oilseeds, rice, sugar, milk and beef are fully decoupled in the model, in order to see if this affects the markets of tobacco, cotton and olive oil and how this part of the CAP reform affects the Mediterranean EU-countries.

The assumptions of this scenario are taken over in the second, third and fourth scenario. Furthermore, in the second scenario the direct payments for tobacco, cotton and olive oil are decoupled, but all provisions of coupling are used. For tobacco all payments provided as production aid must be decoupled after 2010 and 50% of them will go to the Restructuring Envelope and therefore will no longer be provided as direct payment to the producers.

Table 1. Base Assumption (BA) and simulated Scenarios (SC)

	Agenda 2000	Lux. agreement	Tobacco	Cotton	Olive oil
BA	✓	-	-	-	-
SC1	✓	Total decoupling of all direct payments for all products except of tobacco, cotton, olive oil	-	-	-
SC2	✓	Same as SC1	100% decoupling, direct payments reduced by 50%	65% decoupling of direct payments	60% decoupling of direct payments
SC3	✓	Same as SC1	Same as SC2	100% decoupling of direct payments	100% decoupling of direct payments
SC4	✓	Same as SC1	Same as SC2	Same as SC3	100% decoupling, direct payments reduced by 40%
SC5	✓	-	Same as SC2	Same as SC2	Same as SC2

In the third and fourth scenario all direct payments for all products are decoupled. Their only difference is that in the fourth scenario the production aid of olive oil is reduced by 40%. This 40% goes to the National Envelope and the Member States can distribute it to the producers as a coupled payment (SC2), as a decoupled payment (SC3) or use it for other purposes, like restructuring of the olive groves and the cultivation areas (SC4).

Finally in the fifth scenario all assumptions of the second scenario for the markets of the three Mediterranean products are taken over. The payments for all other products of the model remain coupled, as before the Luxembourg Agreement, so as to see the effects of the reform for the Mediterranean products without effects that might occur because of the introduction of the Single Farm Payment to other commodities.

The base year is 2001 and therefore the base assumption for all scenarios is the fully implementation of Agenda 2000, without reforms on the milk market. As a consequence reforms under Agenda 2000 from the years 2002 and 2003 are not implemented in the base year. In order to include these reforms direct payments for oilseeds and beef prices were decreased and direct payments for beef were increased.

The variation of the multipliers for production-effectiveness is used in sensitivity analyses and thus three sub-scenarios are modeled for every main scenario. The production-effectiveness is modeled to be a) initial to the coupled payments, b) half of them and c) the decoupled payments have no production effects.

Empirical Analysis – Model Results

The presented results involve changes in prices, production quantities, consumption, trade and welfare, with special emphasis to tobacco, cotton and olive oil on the Mediterranean countries included in the analysis. For more details see tables A.1 to A.9 in annex 2.

The main trends observed by the decoupling of direct payments on the markets of cotton, tobacco and olive oil in Greece, Italy and Spain are shown in Table 2. The farm gate prices of cotton decrease but increase in the cases of tobacco and olive oil. The producer incentive prices (they are calculated as the sum of the farm gate price and the subsidies, that are assumed to affect production) decrease. As a result the production falls and this is reflected in the quantities traded. Since the demand stays almost stable, the exports of the net exporter countries decrease and the imports of the net importer countries increase.

In principle, the changes in border prices are the same with the changes in farm gate prices, since no further price policy is assumed and therefore the changes of the border prices are directly transmitted to the producers.

Table 2. Trends due to the CAP Reform in Greece, Italy and Spain (Scenarios 2, 3, 4)

Commodities	Farm Gate Price	Producer Incentive Price	Production	Demand	Net trade
Cotton	→	→	→	→	→
Tobacco	→	→	→	→	→
Olive oil	→	→	→	→	→

To be more specific the results are presented in two steps. First, the changes to the production of tobacco, olive oil and cotton due to the scenarios 2, 3 and 4 are presented and discussed. Second, the welfare effects for the Mediterranean EU-Member States and the EU-15 follow.

Tobacco

Decoupling of direct payments and a parallel reduction of them by 50% (Scenario 2) results in a reduction of the production by all three Mediterranean countries, as shown in Table 3.

Table 3. Change of tobacco production from basis scenario due to decoupling (in%)

Scenario	Production-effectiveness	Greece	Italy	Spain
2	initial	-11.57	-14.67	-7.65
	half	-11.84	-15.14	-7.75
	no	-12.10	-15.59	-7.84

The decrease in production is greater with the gradual decrease of the production-effectiveness. The farm gate prices slightly rise from 1.4% in Italy with the initial production-effectiveness to 0.37% in Spain with no production-effectiveness. This is to be expected. Under the CAP Reform a reduction of direct subsidies is provided. This reduction results in a reduced producer incentive price (farm gate price + subsidies). The later results in a decrease in production which leads to an increase of the farm gate prices.

The demand remains almost stable, since the decoupling of direct payments affects only the production side and the way the producer takes the subsidies. The changes of production are reflected in the net trade. Greece is a net exporter of tobacco and now, because of the decreased supply exports about 300,000 tonnes less. Spain needs to import 3,000 tonnes more, in order to cover the demand. Italy is initially a net exporter, but due to the decreased production becomes a net importer. Instead of exports of 16,000 tonnes as in the base assumption Italy imports 2,000 tonnes of tobacco due to the CAP reform.

Olive oil

In the olive oil market the same trends regarding the produced quantities are observed (Table 4). The production decreases more in Italy than in Greece and Spain, whereas the differences between the sub-scenarios are small for all countries and main scenarios. The level of decoupling slightly affects the decreases. They are more intense under the third scenario, where the option of 100% decoupling of direct payments is modeled. Nevertheless, the reduction of the direct payment by 40%, which is modelled in scenario 3 additionally to the full decoupling option, seems to have almost no influence on the changes in production.

Table 4. Change of olive oil production from basis scenario due to decoupling (in%)

Scenario	Production-effectiveness	Greece	Italy	Spain
2	initial	-0.53	-0.94	-0.58
	half	-0.75	-1.20	-0.41
	no	-0.99	-1.46	-0.17
3	initial	-1.10	-2.39	-1.28
	half	-1.44	-2.88	-1.14
	no	-1.83	-3.43	-0.91
4	initial	-1.18	-2.45	-1.25
	half	-1.49	-2.91	-1.11
	no	-1.83	-3.43	-0.91

Farm gate prices slightly fall with the option of 60% decoupling of direct payments (second scenario) in all countries with less than initial production-effectiveness, but slightly rise in all other cases and scenarios. The changes in prices are more intense on the third sub-scenario with no production-effectiveness of decoupled payments.

Demand here also remains unaffected and the net trade remains almost stable. Greece and Spain continue to export about 205,000 and 480,000 tonnes respectively, whereas Italy exports about 232,000 to 242,000 tonnes.

Cotton

Regarding cotton, the results concern only Greece and Spain, as the two main and almost exclusive cotton producers of the European Union. With regard to the quantities produced the same tendencies are observed as by tobacco and olive oil. The production decreases and this decrease is greater when 100% of the given direct payments are decoupled in scenario 3 (Table 5.). The changes between the sub-scenarios are again minor.

Table 5. Change of cotton production from basis scenario due to decoupling (in%)

Scenario	Production-effectiveness	Greece	Spain
2	initial	-4.71	-5.80
	half	-5.50	-6.22
	no	-6.34	-6.66
3	initial	-8.41	-10.56
	half	-9.72	-11.22
	no	-11.19	-11.93

Compared to tobacco and olive oil markets, the reversed tendency is observed to the farm gate prices. They slightly decrease by about 0.7% in Greece and 0.5% in Spain. The producer incentive prices also decrease in both countries.

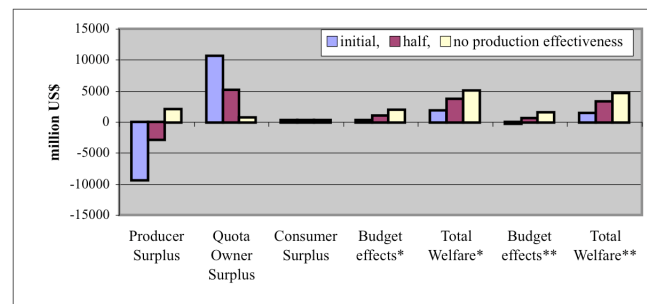
On the side of demand, decoupling results in almost no changes. The observed reduction of production results in a decrease of the exports by about 200,000 to 300,000 tonnes in Greece in scenarios 2 and 3 respectively. In the case of full decoupling (scenario 3) Spain becomes a net importer of about 2,000 tonnes.

Welfare effects

The decoupling of direct payments results in welfare losses for the producers and welfare gains to all other components of social welfare (quota owner, consumer, budget) in both the EU-15 and the southern EU countries (for detailed figures, see Table A.9 in the annex). Figures 2 and 3 present the effects of decoupling using all the provisions of coupling for tobacco, olive oil and cotton (scenario 2), with parallel variation of the production-effectiveness. The producer surplus is reduced more if the direct decoupled payments have the same influence with direct-coupled payments and is positive only when there is no impact of the decoupled payments on the production (third sub-scenario) in the EU-15. The reverse can be observed by the quota owner surplus. It is lower if the production-effectiveness is lower. The consumer surplus is small and remains constant with the variation of the production-effectiveness, due to the constant demand. Concerning the budget, it is positive mainly because of reduced expenditure. Nevertheless, two different budget effects and consequently two different total welfare effects are illustrated in the figures, which involve the reduced amount of direct payments of tobacco and olive oil. In the first case (budget effect* and total welfare* of the figures 2, 3 and 4), this amount is assumed to increase welfare, because it is no longer used as direct payments and can be used in alternative ways. This results in lower budget expenditure in terms of welfare. In the

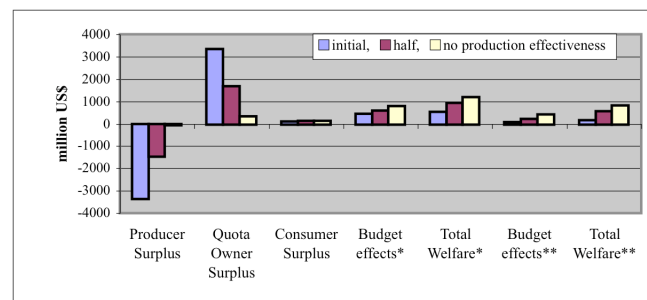
second case this amount is not assumed to increase welfare, because it remains in the sector of the examined products for e.g. restructuring programs. Thus the amount is earmarked and therefore the budget expenditure is higher than in the first case. This results in lower total welfare gains. It should also be noted that the CAP is financed according to the principle of financial solidarity. Thus, the budget effects will not occur in the different member states but in the EU budget. Taking into account the relatively low contributions of the Mediterranean member states to the EU budget, the welfare gains due to lower budget expenditure should be in fact only partially included in the national budget effect. This results in a lower change in total welfare for the Mediterranean EU countries.

Full decoupling without the provisions of coupling results in the same trends, but with higher losses for producers and higher gains for the budget, due to more significantly reduced expenditure.



*, ** see text.

Figure 2. Welfare effects of decoupling on the EU-15 using the provisions of coupling (scenario 2)

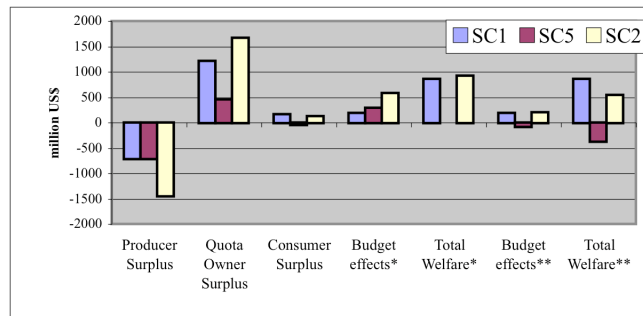


*, ** see text.

Figure 3. Welfare effects of decoupling on the south-EU countries using the provisions of coupling (scenario 2)

Figure 4 compares the welfare effects of scenarios 1, 5 and 2 to show the impacts of the different steps of CAP reform. Scenario 1 simulates decoupling direct payments for the products

initially included in the Luxembourg Agreement, scenario 5 simulates the hypothetical situation of decoupling direct payments only for cotton, olive oil and tobacco and in scenario 2 the complete CAP reform using all the provisions of coupling for the three products is simulated. It is shown that the markets of the latest products are of major importance for the Mediterranean EU Member-States, whereas for those countries the effects of the Luxembourg Agreement are not negligible. The losses for the producers are higher under the so-called Reform for the Mediterranean products, but on the other side the higher gains for the budget are observed under this reform.



*, ** see text.

Figure 4. Welfare effects of decoupling on the Mediterranean EU Member-States (half production-effectiveness)

The producers lose the same amount when only the Luxembourg Agreement is applied or only the obligatory reform of the CAP for tobacco, olive oil and cotton. Nevertheless, the latter does not provide budget gains. Again the difference on the budget due to the assumptions about the welfare effects of the reduced amount of direct payments of tobacco and olive oil is well reflected.

Summary

The Reform of the CAP for the Mediterranean products tobacco, olive oil and cotton, as a follow up of the Luxembourg Agreement, will influence and determine the agricultural sector of the Mediterranean member states of the EU. A key point of this reform is the introduction of the Single Farm Payment, whereas price cuts or adjustments were not necessary.

As the empirical analysis shows, the producer incentive price – including the farm gate price and subsidies which are assumed to affect production – falls down in all examined main scenarios and sub-scenarios, followed by a decrease in the produced quantities. The demand remains almost constant, since the introduced decoupled direct payments are supposed to influence only the production side. Analogous tendencies are shown regarding net trade. The

exports fall and the imports rise, resulting in changes of the net trade status in Spain and Italy by the trade of cotton and olive oil accordingly.

The change of producer surplus is negative by all scenarios and countries, but the change of quota owner surplus is always positive and can compensate for the losses of producer surplus. The reform of the CAP results in lower budget expenditure. The Mediterranean member states of the EU are those most affected countries by the reform for the Mediterranean products in the EU.

This empirical analysis was carried out with an updated version of the model AGRISIM. The updates involved not only the implementation of decoupled payments in the model, according to the theoretical analysis, but also the extension of the data bank of the model with the three products, namely cotton, olive oil and tobacco and the modeling of Greece, Italy and Spain and the rest of the EU-15 countries as separate regions. This contribution could be seen as a first step of modeling Mediterranean commodities and sets the basis of further development of the model. Nevertheless, the simulation of the decoupled direct payments under different scenarios does provide deeper insights concerning prices, quantities and welfare due to the different reform steps.

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Annex 1: AGRISIM – Important Equations

Supply function

$$q_i^A = a_i \left[p_i^P - p_{Quo}^i \right]^j \cdot \left[p_j^P - p_{Quo}^j \right]^j \cdot SA_i$$

- q_i^A - Supply of the commodity i
- a_i - Coefficient
- ε_i - Price elasticity of supply of i
- $p_{i,j}^P$ - Producer incentive price of commodities i, j
- ε_{ij} - Cross price elasticity of supply of i in respect of j
- $p_{Quo}^{i,j}$ - Quota price of commodities i, j
- SA_i - Shift factor of commodity i

Demand function

$$q_i^N = n_i \cdot p_i^{\eta_i} \cdot p_j^{\eta_j} \cdot y^{\theta_i} \cdot B \cdot N_i$$

- q_i^N - Demand of commodity i
- n_i - Coefficient
- $p_{i,j}$ - Domestic price of i, j
- η_i - Price elasticity of demand of commodity i
- η_j - Cross price elasticity of demand of commodity i in respect to j
- y - Per capita income
- η_i - Income elasticity of demand
- B - Population
- N_i - Shift factor of commodity i

Other Components of Demand

$$q_i^S = \beta_i \cdot q_i^A \cdot SS_i$$

- q_i^N - Seed demand of commodity i
- β_i - Relation between seed quantity and production in base year
- SS_i - Shift factor of commodity i

$$q_i^F = f_i \cdot p_i^{\eta_i} \cdot p_j^{\eta_j} \cdot T \cdot SF_i$$

- q_i^F - Feed demand of commodity i
- f_i - Coefficient
- T - Relation between animal production in base year and in terminal year, in grain units
- SF_i - Shift factor of commodity i

$$q_i^V = \delta_i \cdot q_i^A \cdot SV_i$$

- q_i^V - Waste of commodity i
- δ_i - Relation between waste and production in base year
- SV_i - Shift factor of commodity i

$$q_i^L = q_{iB}^L$$

- q_i^L - Stock of commodity i
- q_{iB}^L - Stock of commodity i in base year

Price Transmission

$$p_i = t \cdot p_w^\gamma$$

- p_i - Domestic price
- t - Coefficient
- p^w - World market price
- γ - Price transmission elasticity

$$p_i^P = p_i + \sum_S \alpha_S Z_S$$

- p_i^P - Producer incentive price
- Z_S - Subventions per tonne
- α_S - Production-effectiveness

Equilibrium conditions

$$q_{ir}^H = q_{ir}^A - \left[q_{ir}^N + q_{ir}^F + q_{ir}^S + q_{ir}^V + q_{ir}^L \right]$$

- $\forall i \in \text{commodities}$
- $\forall r \in \text{regions}$

$$\sum_r q_{ir}^H = 0 \quad \forall i \in \text{commodities}$$

*Annex 2**Results of AGRISIM***Table A.1.** Change of Farm Gate Prices in EU15 (%)

	Scenario 1			Scenario 2			Scenario 5		
	Production-effectiveness			Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no	initial	half	no
Wheat	1.66	3.10	4.51	1.55	3.04	4.50	-0.14	-0.07	-0.01
Coarse Grains	2.01	2.92	3.83	1.95	2.89	3.84	-0.05	-0.02	0.01
Oilseeds	0.29	1.13	2.01	0.08	0.97	1.90	-0.22	-0.18	-0.13
Sugar	0.09	0.19	0.29	0.09	0.19	0.29	0.01	0.01	0.01
Milk	-0.06	-0.14	0.19	-0.07	-0.15	0.18	0.00	-0.01	-0.01
Beef	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02	0.00	0.00	0.00
Pigmeat	-0.44	-0.86	-1.39	-0.42	-0.85	-1.40	0.03	0.01	0.00
Poultry	-0.53	-0.84	-1.27	-0.50	-0.83	-1.28	0.03	0.01	0.00

Table A.2. Change of Farm Gate Prices in Greece (%)

	Olive Oil			Tobacco			Cotton		
	Production-effectiveness			Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no	initial	half	no
Scenario 1	-1.28	-2.00	-2.91	0.04	-0.13	-0.19	-0.89	-1.02	-1.35
Scenario 2	0.35	-0.29	-1.12	0.89	0.72	0.66	-0.70	-0.81	-1.14
Scenario 3	1.60	1.08	0.38	0.87	0.69	0.62	-0.54	-0.63	-0.93
Scenario 4	1.59	1.06	0.38	0.86	0.68	0.62	-0.53	-0.63	-0.93
Scenario 5	1.83	1.82	1.81	0.88	0.86	0.85	0.18	0.20	0.22

Table A.3. Change of Farm Gate Prices in Italy (%)

	Olive Oil			Tobacco		
	Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no
Scenario 1	-0.91	-1.42	-2.08	0.07	-0.20	-0.30
Scenario 2	0.25	-0.20	-0.80	1.40	1.13	1.03
Scenario 3	1.14	0.77	0.27	1.37	1.08	0.97
Scenario 4	1.13	0.76	0.27	1.35	1.07	0.97
Scenario 5	1.30	1.30	1.29	1.38	1.35	1.33

Table A.4. Change of Farm Gate Prices in Spain (%)

	Olive Oil			Tobacco			Cotton		
	Production-effectiveness			Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no	initial	half	no
Scenario 1	-0.84	-1.31	-1.92	0.02	-0.07	-0.11	-0.57	-0.65	-0.86
Scenario 2	0.23	-0.19	-0.74	0.50	0.40	0.37	-0.45	-0.52	-0.73
Scenario 3	1.05	0.71	0.25	0.49	0.38	0.35	-0.35	-0.40	-0.60
Scenario 4	1.05	0.70	0.25	0.48	0.38	0.35	-0.34	-0.40	-0.60
Scenario 5	1.20	1.20	1.19	0.49	0.48	0.48	0.12	0.13	0.14

Table A.5. Change of Production in Rest of EU15 (%)

	Scenario 1			Scenario 2			Scenario 5			
	Production-effectiveness			Production-effectiveness			Production-effectiveness			
	initial	half	no	initial	half	no	initial	half	no	
Wheat	-9.19	-14.55	-20.13	-9.19	-14.56	20.13	-	-0.02	-0.01	0.00
Coarse Grains	-18.06	-26.45	-35.18	-18.03	-26.43	35.18	-	0.04	0.02	0.00
Oilseeds	-1.78	-6.51	-11.60	-1.78	-6.50	11.57	-	0.04	0.04	0.04
Sugar	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00
Milk	0.00	0.00	-1.40	0.00	0.00	-1.41	-	0.00	0.00	0.00
Beef	2.17	-7.46	-18.55	2.24	-7.43	18.56	-	0.06	0.03	0.00
Pigmeat	3.94	7.84	12.68	3.94	7.85	12.68	-	0.01	0.00	0.00
Poultry	3.68	5.93	8.55	3.70	5.94	8.55	-	0.01	0.01	0.00
Tobacco	0.41	0.19	-0.02	-11.79	-12.16	12.52	-	-12.48	-12.49	-12.49
Olive Oil	14.30	10.70	4.78	12.68	8.47	1.18	-	-3.30	-3.34	-3.38

Table A.6. Change of Production in Greece (%)

	Scenario 1			Scenario 2			Scenario 5		
	Production-effectiveness			Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no	initial	half	no
Wheat	35.03	37.33	39.72	26.66	32.80	39.72	-1.01	-0.45	0.00
Coarse Grains	-15.48	-13.79	-11.77	-19.60	-16.50	-11.77	-4.37	-2.39	0.00
Oilseeds	10.38	10.27	10.32	12.39	11.92	12.17	3.84	2.75	1.65
Sugar	0.00	0.00	0.00	0.00	0.00	0.00	-6.08	-3.25	0.00
Milk	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef	-18.99	-20.73	-22.51	-13.27	-17.77	-22.51	5.03	2.55	0.00
Pigmeat	7.48	8.41	9.34	3.36	6.05	9.34	-2.84	-1.49	0.00
Poultry	3.14	3.49	3.81	1.26	2.42	3.80	-1.34	-0.70	0.00
Cotton	0.37	0.15	-0.08	-4.71	-5.50	-6.34	-5.22	-5.71	-6.22
Tobacco	0.12	0.04	-0.02	-11.57	-11.84	-12.10	-11.76	-11.91	-12.07
Olive Oil	0.11	0.04	-0.04	-0.53	-0.75	-0.99	-0.67	-0.80	-0.94

Table A.7. Change of Production in Italy (%)

	Scenario 1			Scenario 2			Scenario 5		
	Production-effectiveness			Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no	initial	half	no
Wheat	7.28	-8.90	-26.14	13.34	-5.63	-26.14	6.15	3.09	0.00
Coarse Grains	-19.26	-24.73	-30.40	-17.14	-23.62	-30.40	1.83	0.92	0.00
Oilseeds	4.39	-5.49	-15.95	12.21	0.53	-12.00	8.49	6.58	4.64
Sugar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Milk	0.00	0.00	-4.04	0.00	0.00	-4.04	0.00	0.00	0.00
Beef	-10.58	-14.32	-18.96	-9.20	-13.60	-18.96	1.22	0.61	0.00
Pigmeat	2.22	4.14	6.49	1.46	3.68	6.49	-0.68	-0.35	0.00
Poultry	-0.04	0.99	2.28	-0.44	0.73	2.28	-0.41	-0.21	0.00
Tobacco	0.38	0.17	-0.03	-14.67	-15.14	-15.59	-15.39	-15.46	-15.54
Olive Oil	0.89	0.84	0.82	-0.94	-1.20	-1.46	-2.12	-2.17	-2.23

Table A.8. Change of Production in Spain (%)

	Scenario 1			Scenario 2			Scenario 5		
	Production-effectiveness			Production-effectiveness			Production-effectiveness		
	initial	half	no	initial	half	no	initial	half	no
Wheat	-3.94	-10.96	-18.57	0.21	-8.69	-18.57	3.91	1.97	0.00
Coarse Grains	-19.35	-24.85	-30.58	-16.06	-23.12	-30.58	2.83	1.42	0.00
Oilseeds	0.52	-9.01	-18.76	10.78	-1.86	-14.96	10.61	7.63	4.62
Sugar	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.02	0.00
Milk	0.00	0.00	-1.47	0.00	0.00	-1.48	0.00	0.00	0.00
Beef	-3.47	-10.56	-18.51	0.46	-8.42	-18.51	3.78	1.91	0.00
Pigmeat	2.55	3.79	5.21	1.70	3.29	5.21	-0.66	-0.34	0.00
Poultry	5.10	7.53	10.34	3.67	6.67	10.33	-1.05	-0.54	0.00
Cotton	0.40	0.18	-0.05	-5.80	-6.22	-6.66	-6.40	-6.49	-6.59
Tobacco	0.09	0.04	-0.01	-7.65	-7.75	-7.84	-7.78	-7.80	-7.82
Olive Oil	0.42	0.60	0.82	-0.58	-0.41	-0.17	-1.04	-1.01	-0.97

Table A.9. Change of Welfare (million US \$)

		Scenario 1			Scenario 2			Scenario 3			Scenario 4			Scenario 5		
		Production-effectiveness			Production-effectiveness			Production-effectiveness			Production-effectiveness			Production-effectiveness		
		initial	half	no	initial	half	no	initial	half	no	initial	half	no	initial	half	no
Greece	Producer Surplus	-541	-423	-309	-1,052	-739	-433	-1,209	-804	-405	-1,319	-964	-615	-547	-336	-124
	Quota Owner Surplus	511	384	258	909	584	258	1,096	679	258	993	626	258	424	212	0
	Consumer Surplus	13	16	19	5	8	10	0	3	4	0	3	4	-9	-9	-9
	Budget effects*	-1	-2	-3	181	180	178	172	169	165	382	379	375	190	186	181
	Total Welfare*	-18	-25	-34	43	33	14	59	46	22	57	45	22	59	53	48
	Budget effects**	-1	-2	-3	12	11	9	3	1	-3	3	1	-3	21	18	13
	Total Welfare**	-18	-25	-24	-125	-136	-145	-109	-122	-136	-322	-334	-346	-110	-115	-121
Italy	Producer Surplus	-795	-61	344	-1,214	-312	229	-1,356	-366	245	-1,505	-601	-59	-353	-231	-112
	Quota Owner Surplus	1,014	392	38	1,250	509	38	1,368	568	38	1,250	509	38	231	115	0
	Consumer Surplus	59	68	69	41	49	50	29	36	35	30	36	35	-19	-19	-19
	Budget effects*	115	171	284	255	323	447	242	314	443	557	623	747	63	109	155
	Total Welfare*	393	570	735	332	569	763	283	551	761	331	567	761	-78	-26	24
	Budget effects**	115	171	284	104	171	296	90	162	292	101	168	292	-89	-43	3
	Total Welfare**	393	570	733	181	417	609	132	400	607	-124	112	304	-230	-178	-128

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Spain	Producer Surplus	-725	-231	162	-1,067	-396	150	-1,239	-455	185	-1,437	-746	-184	-287	-146	-8
	Quota Owner															
	Surplus	902	441	34	1,168	576	34	1,327	656	34	1,193	588	34	270	135	0
	Consumer Sur-															
	plus	66	81	95	52	66	80	42	56	69	43	56	69	-15	-15	-15
	Budget effects*	-28	24	89	7	74	154	-15	60	149	368	436	519	-53	1	56
	Total Welfare*	215	315	380	160	320	418	115	317	437	166	334	437	-86	-25	33
	Budget effects**	-28	24	89	-44	22	103	-66	8	98	-53	15	98	-105	-51	4
	Total Welfare**	215	315	378	108	268	364	64	265	383	-255	-87	14	-138	-77	-19
EU15	Producer Surplus	-8,002	-2,035	2,356	-9,357	-2,830	2,052	-9,834	-3,012	2,129	10,297	-3,708	1,233	-1,267	-777	-293
	Quota Owner															
	Surplus	9,743	4,745	715	10,669	5,208	716	11,139	5,444	716	10,776	5,261	716	952	473	-4
	Consumer Sur-															
	plus	335	381	337	283	327	282	255	297	248	256	297	248	-55	-55	-55
	Budget effects*	-148	559	1,514	262	996	1,979	218	963	1,959	1,141	1,873	2,855	243	345	446
	Total Welfare*	1,928	3,650	4,922	1,857	3,701	5,028	1,779	3,693	5,053	1,875	3,724	5,053	-127	-14	95
	Budget effects**	-148	559	1,514	-163	571	1,555	-207	539	1,534	-180	552	1,534	-182	-80	22
	Total Welfare**	1,928	3,650	4,934	1,432	3,276	4,614	1,354	3,268	4,639	554	2,403	3,742	-552	-438	-330

*, ** see text.