

Modelling the re-allocation of the European Union's single farm payment entitlements and the re-introduction of set-aside

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Introduction

The European Commission has finalised its legislative proposal as to how it sees the way forward for the Common Agricultural Policy (CAP) in the post 2013 period. The new proposal focuses on four main areas: direct payments, rural development, common market organisation and financing/management/monitoring of the CAP. In this paper we focus on the proposal for direct payments and especially the on-going debate about the redistribution of the single farm payment entitlements among the member states of the EU.

The legislative proposal from the European Commission frames the total amount of direct payments which may be granted in each member state (national ceilings) in the period from 2013 to 2020. During this period the first steps will be taken towards levelling out the per hectare payments given to potentially eligible areas in each member country, but total harmonisation of per hectare payments will still not be fully implemented. In an earlier leaked proposal from the Commission it was envisaged that by 2028 all allocated payment entitlements in the union should have a uniform unit value, so that the average support rate would be roughly €268 per hectare of potentially eligible area in all member states. This was omitted from the final legislative proposal.

In this paper we go one step further than the present proposal from the Commission. We have chosen to model the consequences of re-allocating the single farm payment in 2028 so that all potentially eligible areas in the EU receive €268/ha in support from the CAP together with the requirement that 7 per cent of arable land excluding grass is set aside.

In order to quantify some of the economic effect of redistribution of the Single Payment Scheme (SPS) between European Union's (EU) member states and the introduction of 7 per cent set aside (excluding permanent pasture) a general equilibrium model and database is employed. More specifically the Global Trade Analysis Projects (GTAP) database and model are adapted to highlight the consequence of reallocating the SPS between member states and increased requirement of set aside.

GTAP model/database

The GTAP database is a system of multi-sector economy-wide input/output tables (countries) linked at the sector level through trade flows between commodities used both for final consumption and intermediate use in production. The GTAP version 8 database employed in this analysis represents the global economy in the year 2007 and divides the global economy into 112 countries/regions where the present EU 27 member states are specified as individual countries. The database specifies 57 commodities where 12 are primary and 8 are secondary agricultural commodities. In this analysis the GTAP database is aggregated to 27 countries/regions where 23 EU member states are specified as individual countries while Belgium and Luxembourg are aggregated into one region and Malta and Cyprus into another region. On the commodity

side the database is aggregated into 22 commodities where the 12 primary and 8 secondary agricultural sectors are maintained while manufacturing and services are aggregated into two commodities.

The standard GTAP model is a comparative, static, general equilibrium model, which means that while it examines all aspects of an economy via its general equilibrium feature (as distinct from a partial equilibrium approach that examines only the sector under consideration), it is static in the sense that it does not specifically incorporate dynamics such as improved technology and economies of scale over time unless these are specifically built in. As with any applied economic model, this model is, of course, based on assumptions, both in terms of theoretical structure and the specific parameters and data used. Regional production is generated by a constant return to scale technology in a perfectly competitive environment. The macroeconomic closure is a neoclassical closure where investments are endogenous and adjust to accommodate any changes in savings. This approach is adopted at the global level, and investments are then allocated across regions so that all expected regional rates of return change by the same percentage. Although global investments and savings must be equal, this does not apply at the regional level, where the trade balance is endogenously determined as the difference between regional savings and regional investments. The quantity of endowments (land and natural resources) in each country/region is fixed exogenously within the model, while the extent to which labour is employed is endogenously determined. The capital closure adopted in the model is based on the theory according to which changes in investment levels in each country/region come on-line instantly, updating the capital stocks endogenously in the model simulation.¹

SPS/ SAPS payments in the GTAP database

The agricultural domestic support payments found in the GTAP database originates from the OECD's producer support estimate (PSE) tables. In the case of the EU the PSE table for year 2007 has been disaggregated so that domestic support payments have been allocated to individual member countries and calibrated into the model as input, output, and land -, capital -, labour based subsidies. In the present GTAP version 8 database €31,970 million have been calibrated into the database as decoupled payments since this amount of support in the EU has been deemed by the OECD to fall within policy measures that do not require any commodity production at all (categorised as Other Transfers to Producers in the PSE tables). Within this PSE category of support the SPS together with the SAPS (single area payment scheme) plus national top ups, and separate payments for sugar and additional amounts of aid (R 1782/03 Art. 12) are calibrated into the database. But the €31,970 million calibrated into the initial 2007 GTAP database has to be updated with the health check reform of the CAP and the full in phasing of the SPS in the 12 new member countries. Therefore before modelling the consequences of a reallocation of the SPS between member states a baseline scenario is first run where the GTAP model projects the GTAP database to the year 2028.

In this baseline scenario a further decoupling of direct payments is also undertaken. In the initial 2007 database, €5,493 million are embedded into the database as direct aid payments to farmers. In the health check reform of the CAP the majority of these payments were decoupled and included in the SPS, while at the same time modulation of payments was increased. In the projected 2028 database direct payments have been reduced to €1,770 million, which accounts for remaining coupled sheep/ goat and suckler cows together with cotton premiums. The SPS increases to €39,303 million in 2028 due to the health check's

¹ This capital closure adopted in the model is the so-called Baldwin closure as documented in GTAP Technical Paper no. 7.

decoupling of direct aid and increased modulation, but also because the European Union has fully phased in the SPS in the 12 new member countries by the year 2028. In Table 1 below the initial values of support found in the 2007 database and the new values of support in the updated 2028 database are shown for the individual member states.

Set aside

In the 2007 base year of the GTAP database the EU had 10.2 million hectares of set aside (fallow and green manures). This amount of set aside is reduced in the baseline scenario to 8.7 million hectares which is equivalent to the level of fallow and green manure land found in the EU in the year 2009.

The modelled assumptions made about the amount of land set aside in each member country are calculated using the initial estimates from European Commission staff working paper found in annex 2D. Here the commission have calculated the area to be set aside after deduction of existing fallow land in each member country in the year 2009 when the required rate of set aside was 5 and 10 per cent. In Table 2 below the assumptions used in this analysis are presented. In 2009 Denmark had 5.7 thousand hectares of fallow and green manures which has to increase by 151 thousand hectares reaching a level of 156.7 thousand hectares when the required set aside rate is 7 per cent excluding permanent pasture land. This is a return to the level of set aside found in Denmark in the year 2007, which amounted to 153.7 thousand hectares.

Table 1. Single Farm Payment by Member State, 2007-2028 (million €).

	EU27	Belgium Luxembourg	Bulgaria	Czech Republic	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus Malta
2007^a													
SPS/SAPS Nat.	31970	494	166	379	926	5396	71	1271	1955	3354	5766	3281	44
Direct aid	5493	99	0	1	45	87	0	1	420	1526	2275	525	0
Total	37463	594	166	380	971	5483	71	1272	2375	4880	8041	3806	44
2028^b													
SPS	39303	473	745	817	923	5185	93	1214	2115	4119	6873	3655	56
Direct Aid	1770	92	3	0	1	0	0	0	183	547	770	0	0
Modulation	2097	28	67	92	47	298	7	57	78	210	398	151	2
Total	43170	594	814	909	971	5483	100	1272	2375	4876	8041	3806	58
New^c													
PEA (1000 ha)	161067	1433	3492	3511	2656	16864	865	4637	5564	21027	26496	10199	151
SPS/hectare (€)	268	414	233	259	365	325	116	274	427	232	303	373	383
Coupled aid	1770	92	3	0	1	0	0	0	183	547	770	0	0
Base payment	39303	274	888	895	676	4300	221	1182	1235	4815	5987	2600	39
Total payments	41073	365	891	895	677	4300	221	1183	1419	5362	6757	2601	39
	Latvia	Lithuania	Hungary	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	United Kingdom
2007^a													
SPS/SAP Nat.	100	175	540	670	615	1244	351	422	49	154	499	671	3377
Direct aid	1	4	3	122	90	11	145	1	8	2	42	45	40
Total	101	179	543	792	705	1255	496	423	57	156	541	716	3417
2028^b													
SPS	140	362	1215	753	612	2954	370	1693	140	349	517	684	3244
Direct Aid	0	0	0	0	66	0	106	0	1	0	1	0	0
Modulation	7	17	104	38	28	90	20	87	3	39	23	32	173
Total	147	379	1319	792	706	3045	496	1780	144	388	541	716	3417
New^c													
PEA (1000 ha)	1546	2641	5057	1816	2729	14151	2918	9721	444	1876	2278	3054	15942
SPS/hectare (€)	95	144	261	436	259	215	170	183	325	207	238	234	214
Coupled aid	0	0	0	0	66	0	106	0	1	0	1	0	0
Base payment	394	673	1289	463	630	3608	638	2479	112	478	580	779	4065
Total payments	394	673	1289	463	696	3608	744	2479	113	478	581	779	4065

Sources: Commission of the European Communities, Financial report from the commission to the European parliament and the council on the European agricultural guarantee fund - 2008 financial year. The OECD's PSE tables. Note from the general secretariat of the council of the European Union to delegations 12734/11.

Notes. ^a *SPS/SAPS Nat.*: The initial values by member state is comprised of the single payment scheme/single area payment scheme plus national top ups, separate payments for sugar and additional amounts of aid -R 1782/03 Art. 12, which are calibrated into the GTAP database as decoupled payments.

Direct aid: Initial values of coupled direct aid calibrated into the GTAP database. Member States have had the option of partially implementing the single payment system. These options will disappear in 2012, except for sheep/goats and suckler cows. http://europa.eu/legislation_summaries/agriculture/environment/ag0003_en.htm

^b *SPS*: The GTAP database is projected to the year 2028 where the values of the SPS have increased due to the fully in phased SPS in the new member countries and the decoupling of direct aid payments included in the SPS. National top ups in new member states are abolished.

Direct Aid: Remaining coupled sheep/goats and suckler cows premiums and cotton payments.

Modulation: Due to the "Health Check" of the CAP modulation is increased by 5% for farmers receiving more than €5000 in direct aid and an additional cut of 4 percent is made on payments above €300,000 a year. The value of modulation by member state has been calculated using Table 3.6.1.14 Direct payments to the producers by size class paid by EAGGF Guarantee (Regulation (EC) n° 1782/2003) - (Financial year 2008) found in the report, Agriculture in the European Union - Statistical and economic information 2010. The new member states have been exempted from modulation until direct payments where fully in phased wherefore an additional modulation rate of 5% was used in these countries.

^c The total value of the new payment reallocated between the EU member countries as represented in the GTAP database in 2028 is allocated to each member state relative to each countries potentially eligible area (PEA). The resulting average support rate in all member countries is €268 per hectare. The specified PEA by member state originates from the general secretariat of the council of the European Union's note to national delegations from the 11 of July 20011 (12734/11).

Table 2. Required additional set aside in 2028.

	Share in PEA		1000 of hectares		% of
	5%	7%			Agricultural. area
	Annex 2D	Own	PEA	7% set aside	excl. P. Pasture
Belgium Luxembourg	2.5	3.5	1433	51	5.2
Bulgaria	3.9	5.5	3492	193	6.2
Czech Republic	3.5	5.0	3511	175	6.3
Denmark	4.1	5.7	2656	151	6.0
Germany	3.3	4.7	16864	793	6.5
Estonia	2.3	3.2	865	28	4.4
Ireland	0.3	0.5	4637	21	4.1
Greece	1.5	2.1	5564	119	3.9
Spain	0.6	0.9	21027	185	1.0
France	2.7	3.8	26496	1002	5.2
Italy	1.7	2.4	10199	243	2.6
Cyprus Malta	2.7	3.8	151	6	4.2
Latvia	1.0	1.5	1546	23	2.0
Lithuania	1.6	2.4	2641	63	2.8
Hungary	4.1	5.7	5057	288	6.4
Netherlands	1.4	2.1	1816	38	3.4
Austria	2.1	3.0	2729	81	5.8
Poland	3.6	5.1	14151	719	6.3
Portugal	0.5	0.7	2918	22	1.1
Romania	3.5	4.9	9721	476	6.2
Slovenia	1.3	1.8	444	8	4.2
Slovakia	2.8	4.0	1876	75	5.5
Finland	2.3	3.4	2278	77	3.3
Sweden	2.0	2.8	3054	87	3.6
United Kingdom	1.0	1.5	15942	242	3.8
EU27	2.3	3.2	161067	5166	4.4

Source. Commission staff working paper. Impact assessment. Common Agricultural policy towards 2020. Annex 2D. and own assumptions.

Scenario.

The modelled scenario in this analysis reallocates the SPS's €39,303 million between the member states in the year 2028 relative to each member countries potentially eligible area (PEA), see table 1 below. The average support rate is €268 per hectare allocated to all potentially eligible area (land) within each member states. In addition to the redistribution of the SPS among member countries the analysis also includes the requirement that 7 percent of the PEA, excluding permanent pasture land, has to be set aside.

The presented analysis uses the standard method of representing decoupled payments in the GTAP database, where the SPS is incorporated into the database as homogenous land, labour and capital subsidy rates for endowments employed in the primary agricultural sectors. Using this standard approach the SPS given to eligible land in the individual member states is cross subsidising labour and capital inputs. Therefore redistributing the SPS between the member states will change agricultural output as more labour/capital is drawn into (out of) agricultural production in each member state.

Two sensitivity analyses are also undertaken. In the first sensitivity analysis, the first scenario is rerun but with trade elasticities are that three times larger than the standard elasticities found in the standard GTAP database. By doing so commodities become more homogenous and consumers are more willing to change domestically produced good out with import commodities if they become relatively cheaper and vice versa.

In the second sensitivity analysis, the first scenario is rerun using a alternative version of the standard GTAP database where the SPS is incorporated into the GTAP database as a homogenous land subsidy, which does not cross subsidise agricultural labour and capital inputs and is therefore 100 per cent decoupled from production. Due to the different calibration of the initial database in this sensitivity analysis compared to the standard database, which has been used in the other two scenarios presented above, the obtained results are not 100 per cent comparable but still give a good indication of the consequences of changing the assumption about how coupled the SPS is in this analysis

Results

The results of the scenario and sensitivity analysis are presented in Tables 3 to 8 below. The results below presented in Table 3, 4, 6 and 7 are subdivided into four groups of results.

- **Agricultural (%).** Highlights results for the primary agricultural sector, showing percentage change in agricultural factor income, land prices, capital stock and labour force employed in primary agriculture.
- **Production (%).** Shows the percentage change in output of commodities within a country due to the reallocation of the SPS.
- **Total Endowments (%).** Shows the percentage change in the total amount of capital and labour force employed in a country.
- **Real GDP (%).** Shows the percentage change in the quantity of goods being produced in each country.

When all the payments given through the SPS are linked directly to land with cross subsidising of labour and capital inputs then, not surprisingly, the reallocation of payments has an effect on land prices and the amount of capital and labour employed in the primary agricultural production. Taking Denmark as an example, Table 3 decomposes the effect of the redistribution of the SPS in the EU27 and the consequences of the reintroduction of set aside in Denmark when the SPS are cross subsidising labour and capital inputs from production.

Table 3. Increased set aside with reductions in coupled SPS payments in Denmark.

Table 3: Increased set aside with reductions in coupled SPS payments in Denmark			
	Denmark	Contributions from	
		SPS	Set aside
Agricultural (%)			
Factor income	-2.5	-2.4	-0.1
Land price	0.7	-5.2	5.9
Labour force	-3.5	-1.3	-2.2
Capital stock	-3.5	-1.3	-2.2
Production (%)			
Primary Agri.	-3.7	-0.9	-2.8
Secondary Agri.	-1.5	-0.4	-1.1
Manufacturing	0.5	0.2	0.3
Services	0.0	0.0	0.0
Total Endowments (%)			
Labour force	-0.0	-0.0	-0.0
Capital	-0.2	-0.1	-0.1
Real GDP (%)	-0.10	-0.03	-0.07

The primary agricultural factor income (returns to land labour and capital) is reduced by 2.5 per cent where 2.4 per cent of this reduction is due to the reduction in SPS (income support) in Denmark and 0.1 per cent reduction due to increased set aside.

The SPS payments in the model are directly linked to land and labour/capital input subsidies whereby a reduction in these payments will reduce the market price of land and raise the input price of capital and labour used in the agricultural sector. This increased capital/labour input cost raises output prices which dampens demand, reducing output by 0.9 per cent. Due to the lower subsidised labour/capital inputs and reduced output the primary agricultural sector reduces the amount of capital and labour employed pushing down the rental/wage rates slightly in the Danish economy. This of course is good news for other industries in the economy which expand their production due to lower rental/wage rate by 0.2 per cent. At the national level, the reduction in the SPS payments has a small negative effect on total employment in the long run, given that employment increases in the manufacturing sector as production expands. The amount of capital in Denmark is reduced by 0.1 per cent due to the slightly lower rental rate in Denmark as investments are reallocated to other countries where returns to capital have increased due to increased SPS payments cross subsidising capital inputs. Finally GDP declines by 0.03 per cent in Denmark due to the reallocation of the SPS within the EU27.

The introduction of set side in Denmark reduces agricultural factor income by 0.1 per cent even though it has a larger impact on agricultural production reducing output by 2.8 per cent, but the price of land increases. This is because the reintroduction of set aside makes the amount of productive agricultural land relatively scarcer in both Denmark and the rest of the European Union reducing agricultural output. This has the effect of slightly pushing up market prices within the EU resulting in an increased return to land but not enough to neutralise a 0.1 per cent reduction in agricultural factor income. The amount of capital and labour used in the primary agricultural sector is reduced in the long run by 2.2 per cent which again slightly pushes down the rental/wage rates in the Danish economy stimulating manufacturing production. Once again total employment is nearly unchanged in the long run with a small decline in the Danish capital stock. The required 7 per cent set aside across the EU27 reduces the Danish GDP by 0.07 per cent.

In Table 4 below the results are shown for all the EU member countries, with the exception of Belgium/Luxembourg and Cyprus/Malta which are aggregated into one region.

From Table 1, it can be seen that 15 out of the 25 countries/regions modelled in this analysis would benefit from increased SPS payments (countries where the initial SPS/hectare is below €268). Generally for all these countries with increased SPS payments, their agricultural factor incomes increase across the line together with land prices which are both boosted by increased SPS payments linked to land and the positive effect of increased set aside. But even though agricultural factor income increases in for example Poland, agricultural production actually declines in some countries as the negative production effect of increased set aside dominates the expansion effect of the coupled SPS payments. The largest gains in terms of GDP growth are found in Latvia, which also had the initial lowest SPS payments per hectare. Here GDP grows by 0.65 per cent with total employment increasing by 0.2 per cent and increased investments in the country increase capital stock by 1.3 per cent. Agricultural production expands by 3.6 per cent pulling out resource from manufacturing production which declines by 1.7 per cent. On the opposite side of the story is Greece where GDP declines by 0.25% reducing both employment and investments in the country. Agricultural production is reduced while some resources are reallocated into manufacturing production increasing production but not enough to stop the decline in GDP.

Looking at the aggregated result for the EU27 as a whole it can be seen that agricultural factor income increases by 1.0 per cent. Decomposing this result it turns out that the aggregated effect of increasing set aside in EU27 raises factor income by 1.0 per cent while the aggregate effect of the redistribution of the SPS is 0.0. This positive effect of increasing set aside on agricultural factor income at the EU level is driven by the assumption that consumers have a

preference for domestically produced agricultural goods and are willing to pay a slightly higher price for these commodities. This behaviour contributes to raising land prices by 6.5 per cent and limiting the decline in agricultural production to 1.6 per cent.

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Table 4. Consequences of re-allocating the SPS and 7 % set aside within the EU. **Partly coupled SPS payments**

	EU27	Belgium Luxembourg	Bulgaria	Czech Republic	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus Malta
Agricultural (%)													
Factor income	1.0	-2.0	4.5	3.0	-2.5	-1.0	15.1	0.7	-4.9	2.8	-0.2	-0.6	-0.6
Land price	6.5	1.2	8.8	7.0	0.7	3.8	28.4	5.1	-6.4	7.0	5.4	2.0	2.6
Labour force	-1.0	-2.9	-0.9	-1.9	-3.5	-2.7	3.5	-0.5	-3.8	1.5	-1.8	-1.1	-1.2
Capital stock	-1.1	-2.7	-1.0	-1.4	-3.5	-2.7	4.0	-0.5	-3.9	1.4	-1.7	-1.1	-1.2
Production (%)													
Primary Agri.	-1.6	-2.4	-2.6	-2.9	-3.7	-3.0	0.3	-0.7	-3.6	1.0	-2.0	-1.1	-1.5
Secondary Agri.	-0.3	-0.4	0.2	-0.4	-1.5	-0.8	0.7	-0.1	-1.4	0.1	-0.2	-0.3	-0.3
Manufacturing	-0.1	0.2	-0.1	0.1	0.5	0.2	-0.7	-0.1	0.7	-0.2	0.2	0.1	0.2
Services	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	-0.2	0.0	0.0	-0.1	0.0
Total Endowments (%)													
Labour force	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Capital stock	-0.0	0.0	0.0	0.0	-0.2	-0.1	0.3	-0.1	-0.4	0.1	0.0	-0.1	0.0
Real GDP (%)	-0.03	-0.03	-0.09	-0.07	-0.10	-0.04	0.13	-0.05	-0.25	0.03	-0.03	-0.05	-0.03

	Latvia	Lithuania	Hungary	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	United Kingdom
Agricultural (%)													
Factor income	21.4	12.6	2.0	-0.2	1.8	5.2	4.0	6.4	-1.0	7.1	1.7	3.1	3.7
Land price	38.7	24.2	6.2	2.3	8.2	11.6	11.1	16.7	0.6	13.3	4.3	9.5	10.9
Labour force	7.8	4.0	-2.4	-1.4	-0.9	-1.1	2.1	0.1	-2.5	0.5	0.4	0.6	1.0
Capital stock	9.0	4.7	-1.9	-1.4	-0.9	-0.7	2.1	0.4	-2.1	1.1	0.4	0.6	1.1
Production (%)													
Primary Agri.	3.6	1.5	-3.1	-1.6	-1.4	-2.7	1.5	-1.9	-2.4	-1.3	-0.1	0.0	0.3
Secondary Agri.	1.2	1.0	-0.4	-0.3	-0.6	-0.7	0.5	0.1	0.1	0.2	0.1	0.1	0.1
Manufacturing	-1.7	-1.4	0.2	0.2	0.1	0.0	-0.3	-0.5	0.1	-0.1	0.0	0.0	-0.1
Services	1.0	0.6	0.0	0.0	0.0	0.0	0.1	0.3	-0.1	0.1	0.0	0.0	0.0
Total Endowments (%)													
Labour force	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital stock	1.3	0.8	0.0	0.0	0.0	0.0	0.1	0.3	-0.1	0.0	0.0	0.0	0.0
Real GDP (%)	0.65	0.42	-0.12	-0.02	-0.02	-0.09	0.04	-0.02	-0.07	-0.02	0.00	0.00	0.01

In Table 6 below the results are shown for the same scenario as presented in Table 4 above, but with a more relaxed assumption about consumer's preference for domestically produced goods.

In Table 5 the welfare implication of the redistribution of the SPS (for the results presented in Table 4) and the introduction of 7% set aside are shown using the Equivalent Variation in income which measures the annual changes in a country's income (gains and losses) from implementing the proposed policy changes. Also shown in Table 5 is the percentage change in per capita utility whereby it becomes possible to rank countries according to their per capita gain/losses. Not surprisingly, Latvia tops the list (initially the lowest SPS/hectare €95) with Greece at the bottom (initially the highest SPS/hectare €427). The EV in income is decomposed into contributions from increasing the amount of set aside and the reallocation of the SPS. Notably Spain, who only has to additionally set aside a relatively small amount of land, gains from the larger reduction in set aside/production in other member countries. Also it can be seen that although Hungary and Czech Republic receive larger SPS payment the required increase in set aside outweighs these gains resulting in a negative EV in income.

Table 5. Equivalent Variation (EV) in income and percentage change in per capita utility.

	Total	Contributions from		Per capita utility
	EV	Set aside	SPS	
	-----	Million of €		---- % ----
Latvia	346	6	340	1.48
Lithuania	352	-15	367	1.29
Estonia	115	-17	133	0.75
Romania	505	-345	850	0.38
Bulgaria	92	-84	176	0.25
Portugal	263	-54	317	0.14
Slovakia	80	-39	119	0.11
Spain	904	171	734	0.08
Poland	221	-446	666	0.07
United Kingdom	535	-258	793	0.03
Finland	32	-16	48	0.02
Sweden	32	-36	68	0.01
Hungary	-20	-88	67	-0.02
Netherlands	-136	80	-216	-0.02
Austria	-62	-75	12	-0.02
Czech Republic	-33	-97	64	-0.03
Ireland	-114	-74	-39	-0.05
France	-1016	-156	-861	-0.05
Germany	-1566	-699	-866	-0.07
Belgium Luxembourg	-299	-91	-208	-0.08
Cyprus Malta	-23	-8	-15	-0.10
Italy	-1461	-288	-1173	-0.10
Slovenia	-53	-28	-24	-0.14
Denmark	-333	-100	-233	-0.15
Greece	-1302	-76	-1226	-0.57
Total EU27	-2942	-2833	-108	-

All in all the redistribution of the SPS within the EU27 and the reintroduction of set aside has a small negative impact on GDP -0.03% and a negative EV of € 2.9 billion of which the majority stem from the reintroduction of set aside €2.8 billion. Since the GTAP model does not include public goods, the gains from improved environmental impacts from

increasing the amount of land set aside are not quantified in this analysis and have to be taken into consideration when evaluating the overall impact of this policy change within the EU.

Sensitivity analysis.

3 x trade elasticities

The standard trade elasticities were increased by 3 times so that the aggregated EU27 agricultural factor income became negative from imposing the required 7 per cent set aside. This was done to highlight the importance of these behavioural parameters when evaluating the impact of the proposed reform.

In Table 6, it can be seen that increasing the trade elasticities between the member countries and thereby the amount of trade between countries contributes to an overall better allocation of resource within the EU27, as the decline in real GDP of 0.03 per cent earlier, is reduced to -0.00.

In the case of Denmark agricultural factor income is now reduced by 4.6 per cent with primary agricultural production reduced by 4.7 per cent. Manufacturing production increases by 0.7 per cent resulting in a reduction in GDP of 0.06 per cent which is an improvement compared to the earlier 0.10 per cent reduction.

100% decoupled SPS

Table 7 below presents the results of the economic effect of redistributing the SPS payments and implementing the required 7 % set aside when the SPS is embedded into the GTAP database as 100 per cent decoupled from production. No cross subsidisation of labour and capital employed in the primary agricultural sector.

When the SPS are 100 decoupled and only allocated in the database as a land subsidy then any movement of payments between member countries will only affect the price of land and thereby farmers factor income with no change in agricultural production. But the redistribution of payments between countries does have an income effect in that national incomes change as agricultural factor income decline or increases in each country which again increase/decreases the demand for final consumption goods in the economy. This changed demand will be for both imported and domestically produced goods so that very small changes in production will occur even though the SPS are 100 % decoupled from agricultural production.

Therefore the production changes found in Table 7 below can be attributed to the implementation of the required 7 percent set aside imposed in the model. Looking at the changes in primary agricultural production shown in table 7 you can see that they all decline with the exception of Spain and Portugal who only had to set aside a relatively small area compared to other countries (1.0 and 1.1 percent of their agricultural area, see Table 2 above).

Table 6. Sensitivity analysis. Partly decoupled SPS with **3 x Trade elasticities**

	EU27	Belgium Luxembourg	Bulgaria	Czech Republic	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus Malta
Agricultural (%)													
Factor income	-0.2	-3.9	3.1	0.9	-4.6	-3.1	15.4	0.1	-7.3	3.2	-1.7	-1.7	-1.7
Land price	4.0	-3.1	6.7	3.8	-3.9	-0.9	29.0	3.7	-11.2	7.9	1.7	-0.6	0.1
Labour force	-1.7	-4.1	-1.4	-2.8	-4.7	-3.8	3.8	-0.9	-5.9	1.8	-2.7	-1.9	-2.0
Capital stock	-1.7	-3.7	-1.5	-1.9	-4.7	-3.8	4.3	-0.9	-5.9	1.8	-2.5	-1.8	-1.9
Production (%)													
Primary Agri.	-2.1	-3.2	-3.1	-3.4	-4.7	-4.0	0.5	-1.0	-5.4	1.4	-2.7	-1.7	-2.3
Secondary Agri.	-0.3	-0.6	0.6	-0.3	-2.0	-1.0	1.1	0.1	-1.8	0.3	-0.1	-0.3	-0.3
Manufacturing	-0.1	0.3	0.1	0.2	0.7	0.3	-1.0	-0.1	1.5	-0.2	0.3	0.2	0.3
Services	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.1
Total Endowments (%)													
Labour force	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.1	-0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1
Real GDP (%)	-0.00	0.00	-0.08	-0.02	-0.06	-0.02	-0.01	-0.04	0.07	0.01	0.01	-0.01	0.03

	Latvia	Lithuania	Hungary	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	United Kingdom
Agricultural (%)													
Factor income	23.4	13.6	0.1	-1.3	0.4	3.1	5.6	4.4	-2.6	5.8	1.6	2.9	3.8
Land price	42.7	26.4	3.2	0.2	5.7	8.2	15.2	13.1	-2.0	11.2	4.1	8.9	10.9
Labour force	9.1	4.9	-3.2	-1.9	-1.8	-1.9	3.2	-0.7	-3.2	0.0	0.4	0.6	1.2
Capital stock	9.9	5.5	-2.4	-1.9	-1.6	-1.4	3.1	-0.2	-2.6	0.8	0.4	0.6	1.2
Production (%)													
Primary Agri.	4.3	2.1	-3.5	-2.1	-2.0	-3.2	2.4	-2.4	-2.8	-1.6	-0.1	0.0	0.4
Secondary Agri.	1.5	1.5	-0.3	-0.4	-0.7	-0.7	0.7	0.1	0.6	0.5	0.2	0.4	0.3
Manufacturing	-2.5	-2.3	0.4	0.4	0.2	0.2	-0.5	-0.3	0.1	-0.1	0.0	0.0	-0.1
Services	0.7	0.2	0.1	0.0	0.0	0.1	0.0	0.2	-0.1	0.1	0.0	0.0	0.0
Total Endowments (%)													
Labour force	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	1.0	0.2	0.1	0.1	0.0	0.0	0.0	0.2	-0.1	0.1	0.0	0.0	0.0
Real GDP (%)	0.41	0.07	-0.04	0.00	0.00	-0.06	-0.01	-0.05	-0.05	-0.01	0.00	0.00	0.01

Table 7. Sensitivity analysis.. **100% decoupled SPS payments**

	EU27	Belgium Luxembourg	Bulgaria	Czech Republic	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Italy	Cyprus Malta
Agricultural (%)													
Factor income	1.0	-2.0	4.6	3.0	-2.5	-1.2	15.3	0.7	-4.5	2.5	-0.5	-0.9	-1.0
Land price	4.3	-2.8	8.7	6.3	-2.1	0.3	30.1	2.5	-13.4	7.0	1.3	-3.2	-2.7
Labour force	-0.9	-1.6	-2.1	-2.4	-2.5	-2.1	-2.3	-0.3	-0.5	0.6	-1.2	0.0	-0.4
Capital stock	-0.8	-1.4	-2.2	-1.9	-2.5	-2.1	-2.1	-0.3	-0.5	0.6	-1.1	0.0	-0.4
Production (%)													
Primary Agri.	-1.5	-1.6	-2.9	-3.1	-3.1	-2.7	-2.6	-0.7	-0.8	0.4	-1.7	-0.3	-0.8
Secondary Agri.	-0.2	-0.2	0.0	-0.5	-1.1	-0.6	0.0	-0.1	-0.4	0.0	-0.1	-0.1	-0.2
Manufacturing	-0.0	0.1	0.0	0.1	0.4	0.1	-0.3	-0.1	0.3	-0.1	0.1	0.0	0.1
Services	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	-0.3	0.0	0.0	-0.1	0.0
Total Endowments (%)													
Labour force	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Capital	-0.0	0.0	0.0	0.0	-0.1	-0.1	0.3	0.0	-0.3	0.0	0.0	-0.1	0.0
Real GDP (%)	-0.03	-0.04	-0.11	-0.07	-0.10	-0.05	0.10	-0.05	-0.24	0.02	-0.03	-0.05	-0.04

	Latvia	Lithuania	Hungary	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	United Kingdom
Agricultural (%)													
Factor income	22.9	13.3	2.0	-0.3	1.5	5.4	4.7	7.1	-1.3	7.8	1.8	3.2	3.9
Land price	45.7	28.6	5.2	0.8	6.1	11.2	18.5	18.6	-0.8	14.3	4.8	8.5	10.9
Labour force	-0.4	-0.8	-2.8	-0.9	-1.4	-2.2	0.3	-1.2	-1.7	-1.2	-0.2	-0.4	-0.6
Capital stock	-0.2	-0.7	-2.2	-0.9	-1.3	-2.0	0.2	-1.1	-1.2	-0.9	-0.2	-0.4	-0.6
Production (%)													
Primary Agri.	-0.7	-1.2	-3.2	-1.3	-1.8	-3.1	0.1	-2.6	-2.0	-2.1	-0.5	-0.8	-1.0
Secondary Agri.	0.8	0.4	-0.5	-0.1	-0.7	-0.8	-0.1	0.0	0.1	0.0	-0.2	-0.1	-0.1
Manufacturing	-1.0	-0.6	0.2	0.2	0.1	0.1	-0.2	-0.4	0.1	0.0	0.0	0.0	0.0
Services	0.9	0.7	0.0	0.0	0.0	0.0	0.1	0.4	-0.1	0.1	0.0	0.0	0.0
Total Endowments (%)													
Labour force	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	1.0	0.7	-0.1	0.0	0.0	0.0	0.0	0.3	-0.1	0.0	0.0	0.0	0.0
Real GDP (%)	0.55	0.40	-0.13	-0.03	-0.03	-0.10	0.02	0.03	-0.07	-0.02	0.00	0.00	0.00

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