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THE ECONOMIC IMPACT OF ALLOWING PARTIAL DECOUPLING UNDER THE 2003 COMMON AGRICULTURAL POLICY REFORMS ON SCOTTISH AGRICULTURE

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ABSTRACT

The agreement to decouple EU direct farm payments from production and introduce the Single Payment Scheme (SPS) was formally made by the Council of Agricultural Ministers in June 2003. Due to concerns raised, the SPS provided Member States the scope to retain some coupled support and this option was taken up by some Member States but not others. Within the UK, Scotland was the only country to take advantage of Article 69 and pay a coupled payment for beef calves (under the Scottish Beef Calf Scheme). This paper, through using conceptual and empirical analyses, assesses whether and to what extent partial decoupling affected the single market and the effect that it had on the EU, member states and Scotland. The results of a modelling exercise (using the CAPRI model) highlight that production in coupled countries is higher than would be the case if they had decoupled, and this has subsequent impacts on other EU Member States through price and trade effects. This is particularly the case in the beef sector. Scottish producers would have been an estimated £31.6m pounds better off if all EU countries had fully decoupled under the reforms. This highlights that Scottish Agriculture was disadvantaged by the decision made in 2003 to allow partial coupling of payments. In addition, even though it would have led to the removal of the Scottish Beef Calf Scheme, beef producers would have been better off if full decoupling had been implemented and Article 69 measures not allowed.

[1]. This paper is based on research undertaken for Defra and the Scottish Government, and usual disclaimers apply. The contact is Alan Renwick, Land Economy and Environment Research, Scottish Agricultural College, Rural Policy Centre, United Kingdom (alan.renwick@sac.ac.uk).

Introduction

The agreement to decouple EU direct farm payments from production and to introduce the Single Payment Scheme (SPS) was formally made by the Council of Agricultural Ministers in June 2003. The European Commission noted that during the pre-reform discussions concerns were raised by some Member States that full decoupling of CAP support might lead to "abandonment of (agricultural) production, the lack of raw material supply for processing industries, or to social and environmental problems in areas with few economic alternatives" (EC, 2008e). As such, under the reformed CAP, the SPS provided Member States with the scope to retain some coupled support. In addition, the national envelopes established under the Agenda 2000 reforms were extended to enable up to 10% of the national ceiling for any sector's Pillar I payments to be diverted into national envelopes which could be used to support "specific types of agriculture which are important for the protection or enhancement of the environment, or for improving the quality and marketing of agricultural products", otherwise known as Article 69 measures.[2] Furthermore, Member States were also allowed to introduce voluntary modulation alongside the compulsory EU modulation as a means of redirecting support towards Pillar II rural development measures.

The most important aspect of the 2003 CAP reform package was the replacement of production subsidies (*e.g.* Arable Area Payments Scheme and Suckler Cow Premium, Sheep Annual Premium) with a single direct payment, conditional on meeting cross-compliance requirements that farmers meet minimum animal welfare, quality and environmental standards. Many studies (see Renwick *et al.*, 2008; Halmai *et al*., 2006; Swinbank, 2005) have discussed how a complex CAP model has now developed as Member States were given options for implementing the SPS, specifically options to:

- implement the Single Payment Scheme at any time between 2005 and 2007;
- re-allocate part of the support through the national envelope (Article 69 measures);
- choose from the regional, historic, static-hybrid or dynamic hybrid models of the SPS; and
- introduce voluntary modulation (only taken up by Portugal and the UK, and within the UK there are some differences in its use).

In addition, there were also limits on the levels of coupled payments retained for different sectors, as indicated in Table 1. As Table 1 also highlights, these limits were amended following the CAP Health Check in 2008.

Under the 2003 Luxembourg agreement, Member States were given the option to choose from three SPS implementation models: the "historic" model; the "regional" (or flat-rate) model; and, the "hybrid" model. With the historic model, SPS payments are farm-specific and relate to the support received in the reference period (average of 2000-2002). The regional model uses a per-hectare payment to all farmers in a region, whilst the hybrid model uses a mix of the historic and regional payments. Specifically, the hybrid model can be static (as in Northern Ireland where the relative proportions of historic and regional payments remain the

[2]. Although these regulations were originally covered under Article 69 and are referred to as such in this paper, they will now dealt with under Article 68, following the CAP Health Check in 2008.

same) or dynamic (as in England where there is gradual movement from the historic model to a fully regional model).

Eligibility for SPS payments are conditional on cross-compliance, with farmers being required to respect Statutory Management Requirements (SMRs) relating to public, plant and animal health, environmental and animal-welfare requirements whilst maintaining land in Good Agricultural and Environmental Condition (GAEC). The SMRs and GAEC suggest that some public goods are provided by farmers in return for the SPS payment.

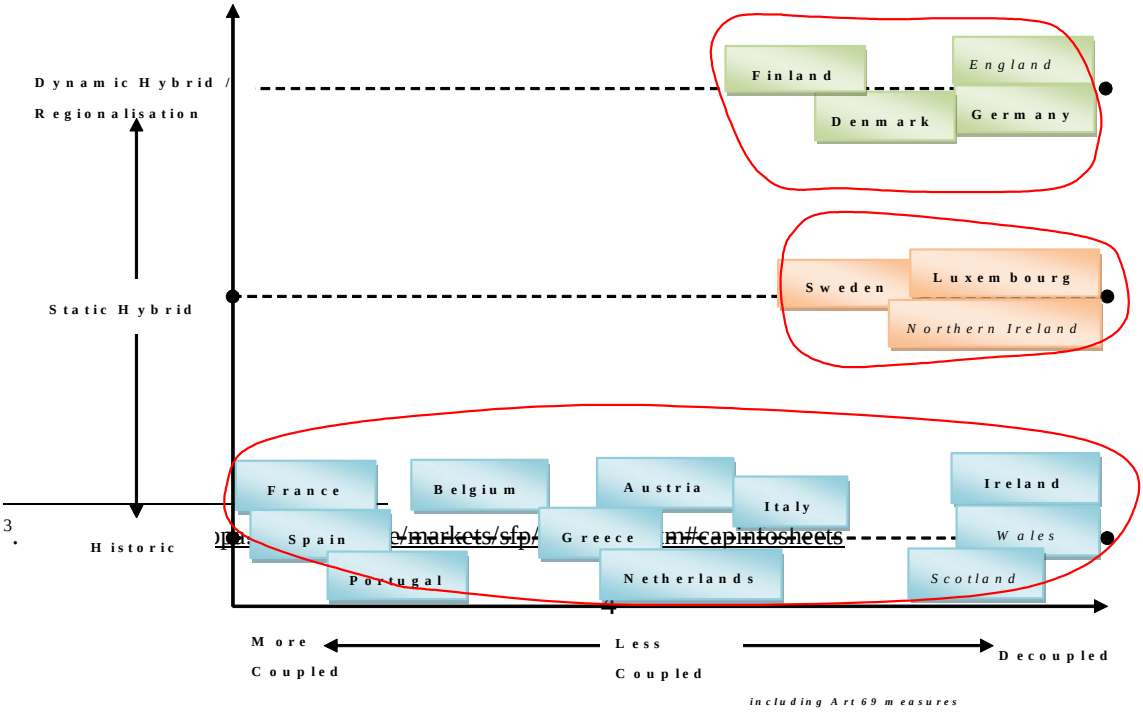
The flexibility in implementing the SPS has meant that there is a range of models and different levels of decoupling across Member States. Some countries, notably France and Spain, continued to maintain as much coupled direct payments as possible, with many other EU15 countries operating largely decoupled payments or only maintaining some partial coupling (usually in the beef sector). Figure 1 shows the diversity in implementation models and levels of decoupling across the EU15.

Table 1 Level of coupled support for selected products pre- and post-2008 CAP Health Check

Sector	Maximum rate of coupled support (%)	2008 CAP Health Check Outcome
Cereals and oilseeds	25	To be decoupled by 2010
or supplementary durum wheat aid	40	To be decoupled by 2010
Sheep and Goat	50	No change
Beef		
Slaughter Premium - Adults	40	To be decoupled by 2012
and Suckler Cow Premium	100	No change
or Special Beef Premium	75	To be decoupled by 2012
or Slaughter Premium – Adults	100	To be decoupled by 2012
plus Slaughter Premium Calves	100	To be decoupled by 2012

Source: Adapted from European Commission[3] and EC (2009b).

Figure 1. Schematic representation of SPS implementation model and degree of decoupling in the EU15 (and within UK)



3 . http://ec.europa.eu/agriculture/markets/sfp/index_en.htm#capinfosheets

In 2005 Scotland implemented the SPS using the historical model based on each farm's average CAP support payments between 2000 and 2002. Scotland also opted to use the national beef envelope (under Article 69) to effectively re-couple some of the beef sector support payments to suckler cow production using the Scottish Beef Calf Scheme (SBCS). The SBCS was introduced in 2005 to support both the supply of quality Scottish beef and also benefit the environment. The SBCS provided payments of around £70 per head for the first ten suckled calves registered and £35 per head for all other beef bred calves from suckler cows thereafter. The number of SFPS and SBCS claimants, total and average farm payments in Scotland from 2005 to 2008 are shown in Table 2.

Table 2 Scotland's Single Farm Payment Scheme and Article 69 Payments

	Single Farm Payment Scheme			Scottish Beef Calf Scheme		
Year	**No. Claims**	**Payments (£m)**	**Average Claim (£)**	**No. Claims**	**Payments (£m)**	**Average Claim (£)**
2005	20,494	391.14	19,085	8,398	18.83	2,242
2006	18,225	326.99	17,942	8,240	19.24	2,334
2007	20,377	439.24	21,555	8,197	20.11	2,453
2008	21,676	443.92	20,480	8,733	18.91	2,165

Source: Scottish Government, 2007 and 2008

The main purpose of this paper is to consider the economic impacts arising from these alternative approaches to implementation of the 2003 reforms, particularly relating to the degree of coupling of payments. With the aid of a simple simulation model, the next section considers the possible effects on production and prices of maintaining coupled payments and highlights the need for an empirical study to help improve understanding of the actual impacts. Section 3 describes the modelling exercise undertaken, whilst Section 4 discusses the results arising from this exercise. Section 5 briefly summarises the main findings.

2. Partial decoupling

Considerable conceptual and empirical work has been undertaken concerning decoupling of agricultural support, in particular by the OECD (for example see OECD, 2001, 2005a, 2005b, 2006; Goodwin and Mishra, 2002, 2003, 2005; Rude, 2006; Bhaskar and Beghin, 2009). In addition, a number of modelling and other empirical studies have been undertaken at EU and Member-State level concerning various aspects of the 2003 CAP reform (OECD, 2003; Sckokai and Moro, 2006; and the IDEMA project[4]). However, relatively little work has been undertaken examining the possible impacts of the decision to implement partial rather than full decoupling. When the issue of decoupling was raised during the Mid-Term Review of the Agenda 2000 reform, analysis was undertaken of its likely impact and also the potential implications of the watering-down of the full decoupling proposals to allow partial decoupling (for example, Renwick *et al*., 2003[r]). Though conceptual in nature, this work highlighted that,

[4]. More information on the IDEMA project can be found at http://www.sli.lu.se/idema/idemahome.asp.

when compared with a number of options for partial decoupling, full decoupling was the preferred policy in terms of economic efficiency.

Simulation exercise

In this section, some of the potential supply and price effects of partial decoupling are illustrated using a simple partial equilibrium model.[5] In broad terms, the model represents a customs union of two countries (A and B). Both countries produce two goods (1 and 2), and their markets are protected from foreign competition by trade barriers, although the two countries are free to trade between themselves. Therefore, the law of one price applies, and both countries face the same prices (assuming that there are no transportation costs). This basic situation is generalised by considering the effect on the results of including more countries in the customs union.

Thus, two situations are simulated. The first considers the case when there are only two countries and one of them (country A) places a coupled payment on the production of good 1. The second considers the situation where there are ten countries in total in the customs union but only one of them (country A) supports the production of good 1. The purpose of the second case is to explore whether the effects of partial decoupling become negligible when only one of a number of countries adopts partial decoupling (i.e., when the proportion of subsidised production under coupled payments in the customs union is small).

In order to simplify the analysis, a number of assumptions are made. First, it is assumed that the decoupled payments have no production-increasing effect, i.e. there are no indirect wealth and risk effects associated with the payments. Second, the coupled payment is simulated as a lump-sum payment per unit of the good produced (i.e. not in the exact form of the regime of direct payments in existence before the CAP reforms of 2003). Third, within the model, the costs of production of good 1 in country A are assumed to be higher than for the same good in country B. Therefore B produces the good more efficiently.

Figures 2 and 3 present the results of the simulation exercise in terms of aggregated supply (and demand) and prices (the weighted average of each price for both countries) for several values of the premium paid to good 1 in country A. These are presented for the case where there are two countries in the customs union (solid lines) and when there are ten (dotted lines). In the figures, the fully decoupled case is given by the value of the variables when the premium paid is zero.

When there are only two countries in the customs union, the effect of the coupled payment is to increase the production of good 1 in country A and overall production of good 1 (Figure 2). This has the impact of decreasing the price for good 1, because of the free movement of goods. The coupled payment for good 1 in country A, within the single market, leads to lower prices for all producers (Figure 3) and distorts production patterns. That is, the more inefficient country A expands production of good 1 at the expense of the more efficient country B. Furthermore, the distortion in production of good 1 also affects production and prices for good 2, as shown in Figures 2 and 3, with the supply of good 2 falling and its price rising as the premium paid to good 1 increases.

5. Full details of the model can be found in Annex I of Renwick *et al.* (2008).

Figure 2. Production Impacts of Coupled Payment

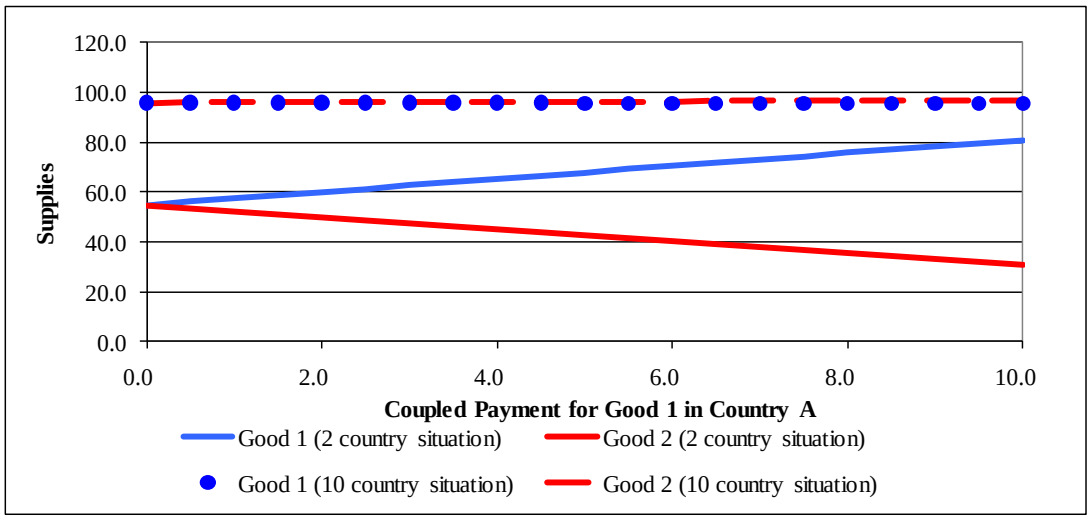
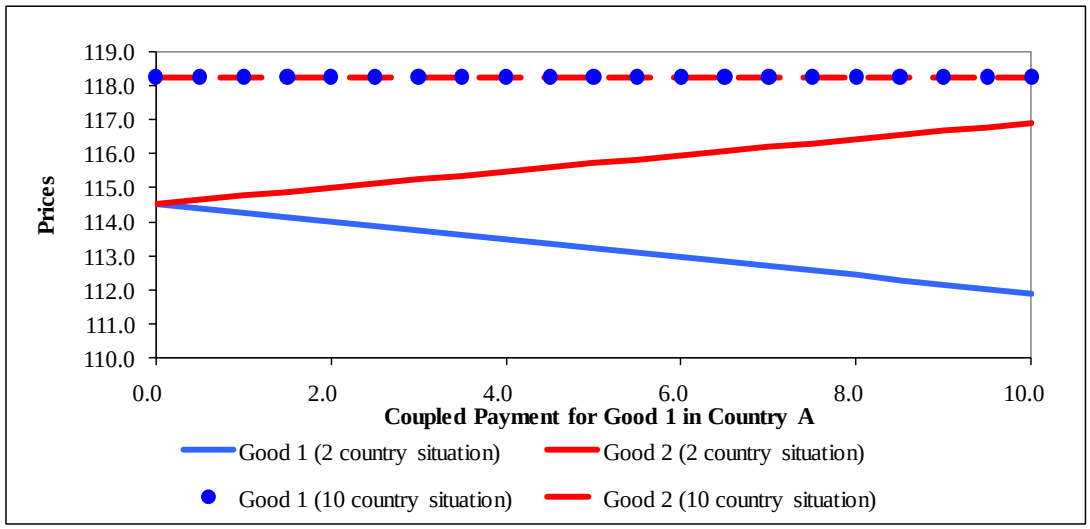


Figure 3. Price Impacts of Coupled Payment

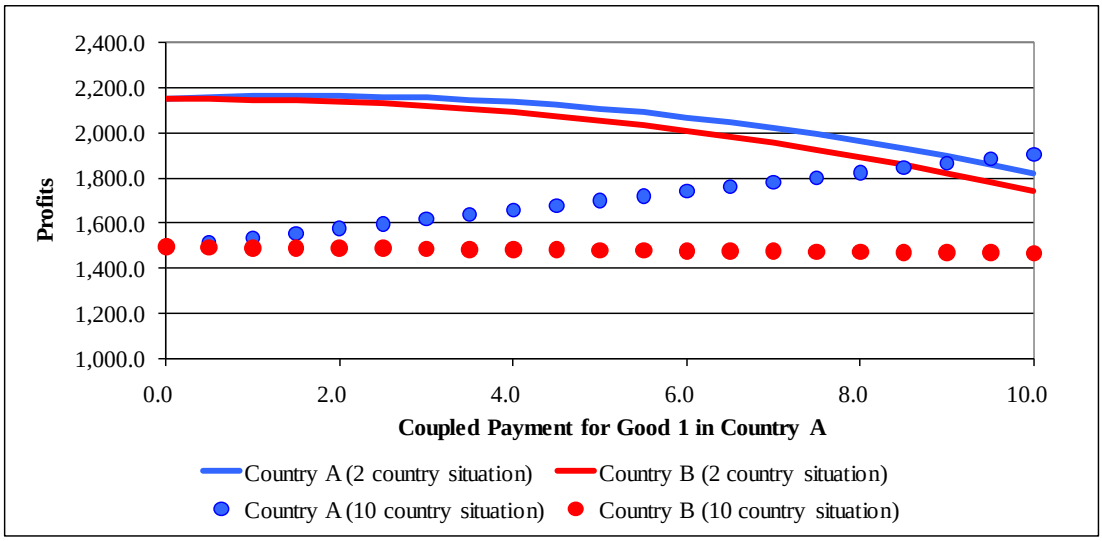


The simulation results for the case when there are ten countries in the customs union and only one uses coupled payments to subsidise good 1 are also presented in Figures 2 and 3. These highlight that, if the output of the sector receiving the payment represents a small proportion of the total output of the custom union, then the depressing effects on output and prices becomes negligible.

Figure 4 highlights the impact on the profitability of production of the coupled payment. In the two-country]two-good situation, the profits of country A slightly increase with low values of the coupled payment. However, higher values of such payment actually depress the profits of both countries. This negative impact arises because (under the assumptions of the model) the coupled payment prompts a supply response that leads to a price reduction for the commodity to the extent that the market price for the good receiving the coupled payment is depressed by a greater proportion than the coupled payment (therefore the total revenue per unit of commodity, *i.e.* market price plus coupled payment, is lower than the market price

without coupled payment). If the proportion of the production under coupled payments is small (*i.e.* illustrated by a custom union with ten countries), then the profits of the country that applies the partial coupled payments actually increase, with the payment per unit, leaving the profits in the remaining countries almost untouched.

Figure 4. Impact on Profits of Coupled Payment



The above simulation exercise highlights a number of factors which are important in determining the extent of the impact of partially coupled payments. These include: the value of the payment; the proportion of overall production that is coupled and; the relative competitiveness of producers. Whilst the exercise usefully highlights some of the *potential* impacts of partial decoupling, it is clear that the *actual* impacts may be influenced by a whole range of factors.

For example, if production of a good subject to coupled payments is not profitable in its own right (as is often the case with agricultural products within the EU), then the incomes of those producers receiving the payments might be reduced compared to a fully decoupled situation, even in the absence of any price-depressing effect. This is because part of the payment will have to be used to subsidise loss-making production, whereas in a decoupled situation producers would be able to cease production and keep the whole of the decoupled payment as income (less a small cost to ensure that the regulatory requirements such as maintaining land in good agricultural and environmental condition (GAEC) are met). At the other extreme, if all production is profitable in its own right, then partial/full decoupling is unlikely to override these market signals.

In the simulations, it is assumed that producers do not use the decoupled payment to subsidise production. However, there has been much discussion as to the likely direct and indirect production effects of decoupled payments (see for example Westcott and Young, 2004; OECD, 2005; Serra *et al.*, 2005; Sckokai and Moro, 2006). The most direct production-inducing effect is if producers continue to treat the payment as coupled (*i.e.* as part of their farming income) and produce similar levels of output as to the situation prior to decoupling. For example, Renwick and Revoredo (2008) highlight that, in the first year after decoupling in the UK, production levels were virtually identical to the pre-decoupled situation, despite the fact that a number of enterprises were clearly unprofitable. However, it might be argued

that this was more of a reaction to the uncertainty surrounding decoupling rather than farmers making longer-term production decisions. Less directly, there are also possible production-inducing effects from decoupled payments arising from their impact on wealth and attitudes to risk (OECD, 2005). If this is the case, then the difference between a partial and full decoupling scenario might be smaller than highlighted by the simulations.

A further confounding effect when considering the impact of coupled payments in agriculture is the fact that some products (*e.g.* cereals) are used as inputs in the production of other products (*e.g.* livestock). In this situation, increased production of the input arising from a coupled payment may in fact reduce costs of production for the other producers. However, in a similar way, the contraction of other crops or livestock due to the substitution effect in production may increase the cost of final goods that use the substitute goods. This highlights that the structure of production (including own- and cross-price elasticities of supply and demand) are important factors in determining the actual impacts of coupled payments.

Adopting partial rather than full decoupling has the potential to impact on production, and this impact may or may not be negligible. In terms of understanding the impact within the EU, a range of factors will be important in addition to those discussed above. These include:

- the extent of uptake of the option by Member States
- the proportion of production within the Member State that remains coupled
- the relative weight of the payment
- the relative share of the Member States exercising the option in overall EU production
- the importance of the product within the EU
- the relative profitability of the product in the absence of support

A further important point was made by the OECD (2001), although in the context of decoupling. They argued that a policy maylead to the same equilibrium outcome as would have occurred without the policy, but that it may still have the *potential* to be distorting if the situation changes. For example, under the very high prices for cereals witnessed in 2007/8, the level of production with and without coupled payments in the cereal sector might be expected to be similar. However, if prices were to fall again to their 2006 levels (of around GBP 60 to GBP 70 per tonne) when relatively little production in the EU was profitable, there may well be a different production response between the decoupled and partially decoupled situation.

3. Quantifying the impact of partial decoupling

The previous analysis has highlighted the potential implications of partial decoupling on prices, production and revenues. However, a number of factors make quantifying the actual impact from available statistics challenging. These include: the relatively short period since implementation; the staggered nature of implementation across countries and sectors; and the complexity of capturing the impact of other key drivers (for example, the food price spike of 2008).

Detailed analysis of production changes since the introduction of decoupling has been undertaken by Thomson *et al.* (2009) using FADN data. The results of this analysis highlight few distinct differences in production trends between those countries that fully decoupled and those that did not. The one exception appears to be in the beef sector where there is a

divergent trend emerging between France who maintained the maximum allowable degree of coupling and countries such as the UK and Germany who fully decoupled.
The potential complexity of the issues involved and the lack of long-run data on the impact of partial decoupling support the use of an approach that, whilst taking account of up-to-date data, is able to simulate the development of markets within the EU over time with and without decoupling. Therefore the approach adopted is to use a well recognised partial equilibrium model (the CAPRI model) to consider the development of agricultural markets up to 2013 (the end of current policy period) and to examine the impacts on production, prices and revenues. The next section briefly describes the key features of the model.

CAPRI Model

The CAPRI model combines a representation of agricultural supply based on positive mathematical programming with a global trade model for agricultural commodities.[6] The supply module of CAPRI covers the most important agricultural activities in EU27 at a regional level (NUTS I[7] in the UK, NUTS II in the rest of the EU). The supply module is able to simulate changes in farmers' behaviour in response to a changed direct payment scheme (such as the implementation of the SPS in the EU). The market model allows the impact on the market price of any changes in production as a response to the direct payment to be fed back to farm-gate prices. It also simultaneously allows the simulation of policy changes at the market level (export subsidies, intervention, import tariffs, tariff rate quotas). Though the core of CAPRI is well documented, it is useful to consider how the SPS is handled within the model.
The payment scheme for subsidies to farmers under the current legislation is part of the optimization procedure of CAPRI. The design of the direct payment and therefore the single payment system adheres closely to the mechanisms defined by the EU regulations. The basic entity of the direct payment system in CAPRI is the premium. Each premium is associated with (i) a list of eligible agricultural activities, (ii) a national or regional ceiling in monetary or physical terms, and (iii) information as to how the premium amount is computed, *i.e.* per slaughtered head, hectare harvested, or historical or actual yield. The ceilings mentioned under (ii) are used to decrease the payments if the ceilings are overshot.
For the premiums defined in the 2003 CAP reform (SPS), a special routine removes premiums that are to be decoupled, and adds a corresponding amount of money to theSPS. The payment is modelled as an amount per hectare that is invariant to the cropping choice of the producer, except for land abandonment. In CAPRI, therefore, the SPS as well as the single area payment scheme in the New Member States influence land rents, but hardly affect the choice of crop mix, except for marginal land abandonment. With this implementation, the "decoupled" payments are not fully decoupled in CAPRI, but have a small general production effect. Nevertheless, the degree of coupling is small compared to the "coupled" payments, and is not crop-specific.
In effect, the SPS payment rates are computed in two steps: First, the total payment per NUTS II region is calculated (for the historical reference year) taking into account payment ceilings,

6. The CAPRI model is widely used and well documented and details of the methodology of the model including the underlying assumptions can be found at http://www.capri-model.org/.
7. NUTS is an abbreviation of Nomenclature of Units for Territorial Statistics, a hierarchical system of administrative regions used by Eurostat. The size of regions at each NUTS level differs by Member State. In England, for example, NUTS I regions correspond to each of nine Government Office Regions, while Bulgaria has only two NUTS I regions.

national coupling options and the choices made regarding the implementation of the single farm payment (for example regional flat rate, hybrid model, single area payment and/or Article 69 choices). The total regional payment is then divided by the regional eligible area to obtain the average SPS amount per hectare in each region, with the total regional amount as the payment ceiling. This approach means that it is possible to capture regional differences in payment rates, if not farm-by-farm differences.

Scenarios

In essence, two main scenarios were compared with the CAPRI model:

- Baseline Scenario — continuation of the current reform situation up to 2013 (*i.e*. with partial decoupling and Article 69)[8]
- Full Decoupling Scenario — complete removal of all coupled payments including those under Article 69 and transfer of these payments to the Single Payment Scheme

In order to gain a better understanding of the potential role individual countries may play, the scenarios were re-run on the assumptions that: only France decoupled; only Spain decoupled; and countries that maintained some form of coupled payments (with the exception of France and Spain) decoupled.

The results are presented in terms of changes from the baseline scenario in 2013. That is, the difference in the key variable (production, prices, welfare, etc.) in 2013 between a situation where payments are fully decoupled is compared to the continuation of the 2003 reforms.

4. Results

In order to simplify analysis, the results presented here are those salient to assessing the key impacts of partial decoupling as highlighted above.[9] Results are presented in terms of the impact of all countries fully decoupling on prices, crop areas and livestock numbers, levels of production and welfare for the EU as a whole, at the Member State level and for Scotland.

Prices

Table 3 highlights the projected changes in EU price under various unilateral decoupling scenarios (Spain only, France only, other countries that have maintained coupled payments only) and if all payments were decoupled across the whole of the EU. Given how the decoupling has been implemented, it is not surprising that the model predicts that the sector most affected is the beef sector, where prices are projected to rise by over 5% if all countries decouple. The role of France in the EU market is highlighted by the fact that if they unilaterally decoupled, prices for beef are projected to be just under 2.5% higher.

[8] It should again be noted that research was undertaken before the CAP Health Check.

[9] Fuller results can be found in Renwick *et al.* (2008).

Table 3. Change in Prices under Decoupling Scenarios+

	Spain only	France only	Other Countries	All fully decoupling
	Per cent			
Soft wheat	0.0	0.1	0.3	0.5
Barley	-0.2	0.1	0.0	0.0
Rape seed	0.0	0.7	0.0	0.7
Sunflower seed	0.0	1.1	0.2	1.4
Soya seed	0.0	0.3	0.0	0.2
Beef	1.5	2.4	1.4	5.4
Pork meat	0.0	0.0	0.0	0.0
Sheep and goat meat	0.6	0.2	0.1	1.0
Poultry meat	0.0	0.1	0.0	0.1

+Change shown is percentage change from baseline scenario in 2013.

Production

Table 4 highlights the impact of full decoupling across the EU on the production of the major commodities where coupling still exists. For comparative purposes it includes figures for the EU as a whole and for individual member states as well as Scotland. It is evident that in terms of overall production full decoupling is not projected to have a major impact when compared to the baseline scenario of continuation of the 2003 reform situation. The largest impact is a projected fall of just under 2% in rape seed production in the EU15. At the Member State and Scottish level, Table 3 highlights generally small changes in production (where larger changes are signified, this is generally from relatively small base levels of production, and therefore the changes are not large in absolute terms).

In terms of the earlier conceptual analysis, some of the changes may seem counter-intuitive, and it is worth exploring these further as they highlight the complex interdependencies in the agricultural system and the difficulty of capturing these within a modelling framework. For example, in Scotland (and the UK as a whole) it might be expected that producers would gain from full decoupling elsewhere, and that production would increase across the main sectors. Whilst this is the case form most sectors, it does not appear to be the case for barley and sheep production, where small declines are computed compared with the baseline. The (small) decline in barley production occurs in almost all countries. It is due to the lower price of barley, which arises from the lower feed cereals demand because of the smaller number of animals. Sheep meat production declines due to increased exports of live lambs from the UK. CAPRI features young animal trade within the EU15, and following the general decoupling of support in continental Europe, the price increase of lambs makes exports from the UK more attractive.

Another interesting finding is that under full decoupling the Scottish Beef Calf Scheme (the only form of coupled payment maintained in Scotland under Pillar 1) would cease, but our results indicate that beef production will increase (albeit by a small percentage). This suggests that the any potential fall in production arising from the removal of this support is more than offset by a general boost in production arising from the higher beef prices (as shown in Table 2).

Table 4. Change in Production under Full Decoupling[+]

EU region	Soft wheat	Barley	Rape seed	Beef	Pork meat	Sheep and goat meat	Poultry meat
				Per cent			
European Union 27	0.01	-0.54	-1.31	-1.03	0.01	-0.78	0.08
European Union 25	0.00	-0.56	-1.33	-1.10	0.01	-0.92	0.08
European Union 15	-0.01	-0.65	-1.83	-1.21	0.02	-0.95	0.09
European Union 10	0.03	-0.07	0.20	0.15	-0.02	0.04	0.06
EU country				**Per cent**			
Belgium and Luxembourg	1.16	-0.15	10.43	-1.80	-0.02	-0.34	0.03
Denmark	1.35	-0.32	4.02	-7.60	0.02	-2.75	0.12
Germany	0.41	-0.42	0.69	0.52	0.02	0.18	0.07
Austria	0.48	-0.25	1.64	-3.41	0.02	0.30	0.13
Netherlands	1.33	-0.76	0.65	-3.19	0.04	0.14	0.08
France	-0.76	-3.18	-9.54	-2.96	0.01	-0.91	0.23
Portugal	15.08	13.52	n/a	-1.73	0.04	-2.42	0.21
Spain	0.80	-0.22	15.94	-2.76	-0.03	-2.01	-0.03
Greece	26.27	23.08	n/a	-1.36	0.02	-0.88	0.18
Italy	-6.96	10.26	8.38	1.29	0.06	-1.53	0.09
Ireland	1.11	-0.65	12.28	1.03	0.03	-0.72	0.13
Finland	0.38	-0.21	18.05	-9.72	0.00	-21.95	0.03
Sweden	0.84	-0.19	2.91	-4.00	0.11	-0.51	0.17
United Kingdom	0.54	-1.05	2.54	1.54	0.02	-0.41	0.10
Scotland	1.42	-1.20	8.87	1.26	0.02	-0.39	0.10

+Change shown is percentage change from baseline scenario in 2013.

Table 5 highlights the predicted changes in selected crop areas and livestock numbers. At the EU level, the cattle herd itself is projected to decline by around 5% for suckler cows. In contrast, little change in cereal production is forecast, and only moderate reduction in oilseed rape production. These figures suggest that the limited extent of coupling in the arable sector is having a negligible impact on the sector at the level of the EU as a whole, whilst in the beef sector there is an impact, albeit relatively small in terms of cattle numbers.

In terms of individual Member States, there are more marked changes in terms of areas sown and livestock numbers. For example, suckler cow numbers in those countries that have maintained coupled payments are projected to fall markedly. In contrast, those countries that have fully decoupled see small increases in herd numbers as a response to the projected price rise.

The table highlights that with the exception of barley area, increases in areas and herd numbers are witnessed in Scotland under the full decoupling scenario. Again it is interesting

that even with the removal of the SBCS the number of suckler cows in Scotland is not predicted to fall (in fact a very small increase is predicted).

Table 5. Change in crop areas and livestock numbers under full decoupling+

EU Region	Soft wheat	Barley	Rape	Suckler Cows	Male adult cattle	Ewes and Goats
			Per cent			
European Union 27	0.00	-0.07	-0.87	-4.98	-0.27	-0.98
European Union 25	-0.01	-0.07	-0.90	-5.05	-0.30	-1.12
European Union 15	-0.03	-0.07	-1.45	-5.10	-0.39	-1.16
European Union 10	0.03	-0.07	0.19	-2.61	0.49	-0.03
EU country	**Per cent**					
Belgium and Luxembourg	1.05	0.08	-0.26	-5.80	2.70	1.44
Denmark	1.29	-0.31	0.99	4.93	-21.80	-4.08
Germany	0.39	-0.40	0.22	5.07	0.77	0.47
Austria	0.45	-0.25	1.35	-13.41	-0.13	0.67
Netherlands	1.20	-0.74	0.00	3.93	-5.48	0.86
France	-0.82	-3.25	-5.06	-9.46	0.46	-2.02
Portugal	13.97	12.85	n/a	-24.55	1.11	-3.21
Spain	0.89	0.07	18.91	-13.05	-1.42	-4.49
Greece	27.27	22.78	n/a	5.16	-4.18	0.22
Italy	-9.86	12.63	5.81	3.00	1.57	0.08
Ireland	1.06	-0.63	0.00	3.92	0.55	1.74
Finland	0.37	-0.18	0.18	-9.00	-17.03	-75.07
Sweden	0.80	-0.12	0.04	4.65	-8.65	1.80
United Kingdom	0.50	-1.03	0.28	3.32	1.33	1.49
Scotland	1.36	-1.17	3.22	0.10	1.21	1.45

+Change shown is percentage change from baseline scenario in 2013.

In order to assess the overall impact on the revenues generated by particular agricultural sectors, it is necessary to combine price and production changes (Table 6). At the EU level, the slight decline in cereal and oilseed production (Table 4) under full decoupling is not matched by price rises (Table 3), and therefore revenues from these crops drop slightly. However for meat production (and beef in particular) the projected price rises do seem to offset the decline in production and revenues increase, albeit very slightly. The decline in production does reduce input costs slightly, and overall gross value added (GVA) rises by around 1% in the EU27 and by slightly more in the EU15.

Unfortunately the CAPRI model produces results for revenues for the UK as a whole but not for Scotland individually. In terms of agricultural revenue (Table 6), virtually all EU countries see a small increase in GVA under the scenario of full decoupling, the only exception being Greece. In addition, in most cases, any projected fall in livestock numbers (Table 5) seems to be more than offset by increased prices leading to small rises in revenues from meat production.

Table 6. Change in Sector Revenues under Full Decoupling[+]

EU Region	Cereals	Oilseeds	Meat	Inputs	Single Payment Premiums	GVA at producer prices plus premiums
	Per cent					
European Union 27	-1.06	-0.95	1.35	-0.16	0.38	0.95
European Union 25	-1.17	-1.09	1.37	-0.16	0.40	0.99
European Union 15	-1.44	-1.51	1.52	-0.17	0.50	1.07
European Union 10	0.01	0.29	0.33	-0.10	-0.11	0.21
Belgium and Luxembourg	0.57	11.21	1.12	0.01	0.03	1.98
Denmark	0.17	4.69	-0.23	0.13	0.75	1.09
Germany	0.20	1.39	1.70	0.81	0.02	0.90
Austria	0.21	1.87	0.78	-0.32	-0.09	1.33
Netherlands	0.98	0.00	0.65	0.27	1.63	0.65
France	-1.34	-10.17	1.30	-0.82	0.87	1.92
Portugal	-1.27	54.90	0.98	-1.61	4.28	2.98
Spain	-2.68	7.49	0.47	-0.92	1.30	1.06
Greece	-9.06	109.03	0.90	0.06	0.04	-0.16
Italy	-5.70	3.59	2.85	0.83	-0.40	0.38
Ireland	0.19	13.43	4.40	3.07	0.00	1.71
Finland	-0.05	18.81	-1.71	-0.08	0.28	1.10
Sweden	0.29	3.57	0.61	0.12	-0.12	1.90
United Kingdom	0.36	3.18	2.84	1.56	0.12	1.27

+Change shown is percentage change from baseline scenario in 2013.

The impact of moving to full decoupling on consumers, producers and taxpayers is highlighted in Table 7. Again the total figures are available for the UK, rather than Scotland, although changes in agricultural income are reported at the Scottish level. For the EU27, there is a projected increase of just under euro 600 million in 2013 in the fully decoupled case when compared with the 2003 reforms. The table highlights that the bulk of this gain is received by the EU15 with only a small gain to the Central and Eastern European Member States (EU10[10]). This is largely to be expected given the nature of support through Europe. Consumers generally lose, due to the projected increases in prices for some commodities. However, this is more than accommodated for by increases in agricultural income, in part due to higher commodity prices but also due to the fact that producers no longer have to undertake loss-making enterprises in order to receive support payments.

It may appear surprising that the model indicates that budgetary impacts arise from the switch between partially and fully decoupled payments. This occurs because under the baseline scenario some ceilings of the coupled payments are not reached and the payments are not fully used (and hence some of the budget is saved). However, this is not the case under full decoupling when the whole (or a larger share) of the overall budget ceiling is used.

[10] EU10 refers to the the eight Central and East European Countries which joined the EU in 2004 plus Malta and Cyprus

Table 7. Change in welfare measures (million euro)[+]

	Total*	Consumer (money metric)^	Producer (agricultural income)	Taxpayer (FEOGA budget outlays first pillar)
European Union 27	596	-962	1798	150
European Union 25	588	-958	1785	150
European Union 15	579	-929	1750	156
European Union 10	9	-29	35	-6
Non-EU	-230	-204		
Belgium and Luxembourg	22.11	-29.12	55.62	0.08
Denmark	1.72	-17.85	27.8	6.47
Germany	35.16	-113.47	166.94	0.57
Austria	23.03	-18.24	41.98	-0.7
Netherlands	4.46	-41.67	65.24	12.33
France	314.3	-214.98	606.89	65.52
Portugal	57.47	-23.1	107.07	23.03
Spain	173.55	-86.55	345.84	59.66
Greece	-36.84	-24.72	-15.66	0.75
Italy	-15.14	-147.56	122.94	-15.58
Ireland	34.73	-13.92	48.91	-0.21
Finland	-0.28	-11.23	12.94	1.63
Sweden	3.25	-26.03	29.38	-0.86
United Kingdom	-38.3	-160.58	134.33	3.28
Scotland	n/a	n/a	31.6	n/a

* Total does not equal sum of others as includes processing revenues and tariff revenues.

+ +Change shown is absolute change from baseline scenario in 2013.

^ Change in consumer welfare is measured by money metric (Money metric is a monetary value of the consumer "welfare". It is obtained from the indirect utility function. Behind it is a computation of "how much consumer budget is needed at the new prices in order to be as well off as in the baseline scenario". If the consumer needs more money (because prices are higher) in order to reach the same utility level, then that amount is taken as the "welfare loss". (see Just *et al.*, 2004, p. 170).

The table highlights that if full decoupling had been implemented across the EU, Scottish producers would have gained to the tune of £31.6m, which is significant proportion of the overall gain to the UK (£134m).

The clear picture that emerges is that the welfare gains are felt most strongly in those countries that currently have maintained coupled payments, namely, France and Spain. The UK suffers a small loss due to the fact that the gains to its agricultural sector are offset by higher food prices. The negative welfare effect for the UK is due mainly to the fact that the country is a net importer of meat. Thus, the consumer loss exceeds the producer gain, and the efficiency gain shows up as a welfare gain somewhere else, *i.e.* where the imported meat is produced (which is not distinguished by CAPRI on the level of intra-EU trade). Although the figures are not available at the Scottish level it might be expected that a different picture may emerge from that of the UK given the considerable surplus in meat production that exists.

5. Summary and Conclusions

This paper has examined the impact of the compromise decision to exempt some sectors from the requirement to fully decouple payments under the 2003 reforms of the CAP on Scottish Agriculture. Through using conceptual and empirical analyses, it assessed whether and to what extent partial decoupling is affecting the single market and the impact it has on those countries and sectors that have embraced full decoupling.

With the help of a simulation model, the potential impacts of maintaining coupling were considered. The analysis highlighted that the *nature* of the impact depends upon the underlying conditions (supply and demand elasticities, etc.) and that a range of factors are important in determining the *extent* of the impact.

Due to the recent nature of the reforms and the way they were implemented, detailed analysis using econometric or other techniques was not really viable. Therefore, a partial equilibrium modelling framework (CAPRI) was used to simulate the situation within the EU within the scenario of full decoupling. Use of the CAPRI model proved very useful for understanding the likely impacts in the EU and in particular provided improved understanding of the impacts that arise because of the complex linkages within the agricultural sector both within and across countries. The results highlighted that production in coupled countries is higher than would be the case if they had decoupled, and this has subsequent impacts on other EU Member States through price and trade effects. This is particularly the case in the beef sector. Though the aggregate EU production and price impacts are generally small, the production impacts on certain Member States and regions are more marked.

Overall, the results suggest that agricultural production would have been higher in Scotland and that agricultural income would have been £31.6m higher if full decoupling had been adopted across the EU. Across the EU welfare levels would have been higher had full decoupling been implemented, and these gains would have been highest in the countries that remained coupled, particularly France and Spain.

Within Scotland, the removal of the SBCS under a decoupling scenario is not forecast to have a negative impact on the beef sector as the gains to Scotland from other countries decoupling payments outweighs the losses from the removal of the scheme.

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