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Impact of CAP Post-2013 Reforms on Agriculture in the UK

FAPRI-UK Project Report

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Executive Summary

This study examines the impact on UK agriculture of the main proposed changes to the regulations governing direct payments under the EU Commission's October 2011 legislative proposals. The analysis is based on the FAPRI-UK partial equilibrium modelling system, which captures the dynamic interrelationships among the variables affecting supply and demand in the main agricultural sectors of England, Wales, Scotland and Northern Ireland. The UK models are run in conjunction with the FAPRI-Missouri EU modelling system to capture the impact of changes across the EU. Five scenarios are analysed:

(i) Redistribution of direct payments between Member States;
(ii) Move towards a uniform flat rate payment per hectare within Member States;
(iii) Greening measures;
(iv) Provision of coupled payments; and
(v) Combined impact of above four reforms, plus removal of sugar quotas.

Following the redistribution of direct payments between Member States [Scenario (i)], the UK benefits from a 1 per cent increase in its national envelope for direct payments, based on the proposed formula within the October 2011 legislative proposals. This is insufficient to stimulate a production response and the overall impact on the UK is marginal.

The move to a uniform flat rate payment per hectare within Member States has a modest impact on aggregate livestock numbers in the UK [Scenario (ii)]. Following the CAP reforms in 2005, a tiered flat rate payment is incorporated within the Baseline in England and this is not changed in the scenario analysis. Within Wales, Scotland and Northern Ireland, the main impact of the introduction of a flat rate system is a redistribution of payments from the lowland producers to those in the hills. However, the main beneficiaries within the hills are the more extensive producers, who are located on lower quality land where the production response is limited. Consequently, the impact of the flat rate payment on aggregate livestock numbers is small.

The ecological focus areas and crop diversification greening measures have a negative impact on crop areas and production in the UK [Scenario (iii)]. There is considerable uncertainty, however, regarding the potential impact of crop diversification and a range of scenarios are presented based on different behavioural responses. In general, the impact is most marked in Wales and Northern Ireland since a large proportion of the arable land within these regions is farmed by livestock producers who grow relatively small areas for feed purposes. Barley is affected to a greater extent than the other crops since it is the main crop grown for home feed purposes on livestock holdings.

The provision of a coupled beef cow payment in Wales and Northern Ireland has a positive impact on cattle numbers [Scenario (iv)]. However, this impact depends on the coupling options implemented elsewhere within the EU. If the introduction of this payment has a significant impact on cow numbers and hence beef production in other EU countries then there will be a negative price impact, which dampens the production impact in the UK.

Upon combining the above reforms [Scenario (v)], it is projected that crop production declines, primarily in response to the greening measures. Again, the extent of this impact depends on the behavioural response to crop diversification. The higher crop prices due to the greening measures exert a downward impact on livestock numbers in the UK, but this is largely offset by compensating increases in meat prices, apart from beef. Within this analysis it is assumed that the re-coupled payment is used to solely support the beef sector, which stimulates EU beef production and leads to a lower price.

Impact of CAP Post-2013 Reforms on Agriculture in the UK

1. Introduction

The EU Commission published legislative proposals in October 2011 that will govern the direction of Common Agricultural Policy (CAP) in the post-2013 period. The stated overall aim of these proposals is to make EU agriculture more competitive and sustainable. The proposals cover direct payments to farmers, market management mechanisms and rural development policies. This report examines the impact of the proposed changes to the regulations governing direct payments on agriculture in the EU, with particular focus on the UK. The analysis is based on the FAPRI-UK partial equilibrium modelling system, which models the key agricultural sectors in the UK. The UK models are run in conjunction with an EU modelling system to capture the impact of changes across the EU. The scenarios and underlying assumptions are based on the October 2011 proposals. The final reform package is likely to be different to the initial proposal and this report does not attempt to anticipate or analyse these potential changes.

The proposed changes to direct payments include the introduction of a new 'Basic Payment Scheme', which will replace the Single Payments Scheme in the EU-15 and the Single Area Payments Scheme in the EU-12. The new basic payment is designed to achieve greater convergence between Member States (external convergence) and between farmers within Member States (internal convergence). The proposals deliver greater convergence between Member States by adjusting the national envelopes for direct payments so that those that receive less (more) than the EU average payment per hectare will receive more (less). Internal convergence refers to the move towards a uniform payment per hectare within Member States or regions by the start of 2019. In addition to the basic payment, the proposals include a "green" per hectare payment for complying with measures regarded as beneficial to the climate and the environment, namely maintenance of permanent pasture, crop diversification and the introduction of ecological focus areas. The proposals also contain a coupled option in which Member States can provide a limited payment linked to a specific product.

The proposed policy changes to direct payments noted above are analysed under different scenarios within this report. With regard to the proposed changes to the market mechanisms, the European Commission also calls for the ending of the sugar quota regime. This is incorporated within an overall combined scenario. Note, the legislative proposals on direct payments also include additional payments to areas with natural constraint, topped up payments for young farmers, fixed payments for small farmers and the capping of payments above certain limits. These policy changes are not incorporated within the analysis as they are either not compatible with a sectoral modelling framework or insufficient data exists to make appropriate assumptions.

Five main scenarios are analysed: (i) Redistribution of direct payments between Member States; (ii) Move towards a uniform payment per hectare within Member States; (iii) Greening measures; (iv) Provision of coupled payments; and (v) Combined impact of preceding CAP reforms, plus removal of sugar quotas. The methodology underlying the analyses is described in Section 2. This is followed by an outline of the scenarios in Section 3. The impacts of the scenarios on the key agriculture sectors in the EU and UK are analysed in Section 4. Conclusions are drawn in Section 5.

2. Methodology

Overview of modelling system

The FAPRI-UK modelling system (created and maintained by personnel in AFBI-QUB) captures the dynamic interrelationships among the variables affecting supply and demand in the main agricultural sectors of England, Wales, Scotland and Northern Ireland (Moss *et al.*, 2011). The modelling system was subject to independent review in 2011 which enabled some adjustments to be made to the system. The model consists of a system of equations covering the dairy, beef, sheep, pigs, poultry, wheat, barley, oats, rapeseed and biofuel sectors. The UK model is fully incorporated within the EU grain, oilseed, livestock and dairy (GOLD) run by FAPRI at the University of Missouri. Consequently, the UK model is not run in isolation but solves simultaneously within the FAPRI integrated partial equilibrium modelling system. It thereby yields UK projections which are consistent with equilibrium at the EU-level and takes account of the impact of changes in EU trade on world prices through reduced form world market equations.

The UK model consists of sub-models for England, Wales, Scotland and Northern Ireland. In general, supply is modelled for each of the four constituent countries of the UK, while demand is modelled at the UK level. This yields projections of livestock numbers, slaughterings, production and market prices for each of the countries in the UK. Commodity production from each of the four constituent countries of the UK is summed to yield UK production. Commodity domestic use, imports and exports are projected at the UK level. In addition, the EU GOLD modelling system generates country specific estimates of supply, utilisation, trade and market prices for the other countries in the GOLD model (France, Germany, Ireland, Italy, rest of EU-15, Poland, Hungary, rest of New Member States-10, Romania and Bulgaria), as well as estimates of supply and utilisation for the total EU.

The commodity sub-models solve at the European level by ensuring EU export supply equals EU export demand in all markets. The key price in each model is adjusted until equilibrium is attained. Changes in the key price lead to adjustments not only in supply and utilisation in the key country, but via price linkage equations to changes in the supply and utilisation totals in all the other markets modelled. The iterative equilibrating process continues until all product markets in all years are in equilibrium (net EU export supply equal to net EU export demand). Thus, the UK commodity prices are consistent

with equilibrium at the EU-level. When a policy scenario is undertaken a reduced form world model is used which captures the impact of changes in trade from the EU through representative world prices. Trade for the EU is subject to the constraints of either the agreements made under the Uruguay Round Agreement on Agriculture (URAA) or scenario assumptions.

The UK model covers the following commodities: dairy, beef, sheep, pigs, poultry, wheat, barley, oats, rapeseed and liquid biofuels.

The UK dairy model consists of submodels for liquid milk, cheese, butter, skim milk powder and whole milk powder. The producer price of liquid milk in England and Wales, Scotland and Northern Ireland is modelled as a weighted function of the prices of the dairy commodities cheese, butter, SMP and WMP. The UK has experienced difficulties in filling its milk quota in recent years. The model assumes milk production is equal to the quota providing milk production yields economic rents. If milk producer prices, however, fall below certain levels, milk production is determined by upward sloping supply functions in each country. Milk production per cow is modelled as a function of a linear trend to proxy for technical change and producer's milk price. Finally, dairy cow numbers are derived as an identity, whereby milk production is divided by milk production per cow.

There are four livestock models in the FAPRI-UK system. The beef, pig and sheep models share a similar structure. The key supply side variable in each of the livestock models is the stock of female breeding animals (cows, sows, and ewes). This stock determines the number of young animals available for fattening and/or slaughter, which in turn determine meat production. Owing to its much shorter production cycle and the lack of Common Agricultural Policy (CAP) policy measures, the poultry model is much simpler. It does not include animal numbers, but models production directly.

The various livestock models are linked primarily through their demand side specifications. The demand side specifications are log specifications of per capita demand. Per capita meat demand is modelled as a function of the prices of the meat in question and of the other meats, all of which are all assumed to be gross and net substitutes in consumption. All of the meat goods are normal, none are treated as luxuries. The beef production model is linked with the dairy models via cow slaughter and calf production from the dairy herd.

Within the crops model land is allocated as a two-step process. Firstly, total cereal land is projected as a function of weighted returns, where the weight reflects the share of the grain in total grain area. Having determined total cereal area, land is distributed across different crops on the basis of expected returns of the crop in question relative to the other crops. Rapeseed area is modelled separately and is a function of expected rapeseed returns and total grain area. Crop yield per hectare is primarily projected as a function

of a trend term, which reflects technology change. To a lesser degree, yields are also affected by prices (small positive impact reflecting higher-yielding varieties from induced innovation) and area devoted to crop production (negative impact due to lower productivity as area increases). The supply of oilseed meals and oils is also projected. Production of oil and meal for each of the oilseeds is determined by the quantities crushed times the appropriate extraction rate.

The modelling system is firstly simulated to generate Baseline projections based on the assumptions that current policies remain in place, specific macroeconomic projections hold and average weather conditions apply. Baseline projections of key variables for each country in the UK are generated for a ten year period. These Baseline projections provide a benchmark against which projections derived from policy scenarios can be compared and interpreted. Within this study, the modelling system is further simulated to incorporate CAP reforms and the results are compared against the Baseline to isolate the impact of these policy changes over the ten-year projection period.

Policies incorporated within Baseline

The Baseline used in this analysis covers the projection period 2012 to 2021 and incorporates the Health Check reforms, including full decoupling of cereal direct payments, beef special premium and slaughter premium in remaining member states; implementation of progressive modulation across the EU; and phased increase of milk quotas up to 2013, followed by abolition in 2015.

Although the Single Payments Scheme and the Single Area Payments are decoupled from production in an administrative sense, it is assumed that these payments exert a partial influence on production. There are a number of reasons why the decoupled payment could have a production stimulating impact. Cross compliance criteria require farmers to "maintain land in good agricultural condition", which implicitly assumes that at least some production will continue. Moreover, economic theory indicates that decoupled payments influence the production decision since increased wealth allows producers to undertake more risk (Hennessey, 1998). In addition, the provision of guaranteed direct payments may enable producers to expand production since they are more likely to be able to access credit. In line with the rest of the GOLD model, it is assumed within the UK models that the decoupled payment has a 30 per cent production stimulating impact compared with the old coupled payments. Further discussion of the treatment of direct payments in the model can be found in Binfield *et al.* (2005a).

Finally, it is assumed that the EU export subsidy limits and import tariffs, agreed under the Uruguay Round Agreements Act (URAA), remain in place.

3. Scenarios

Each of the scenarios is outlined below:

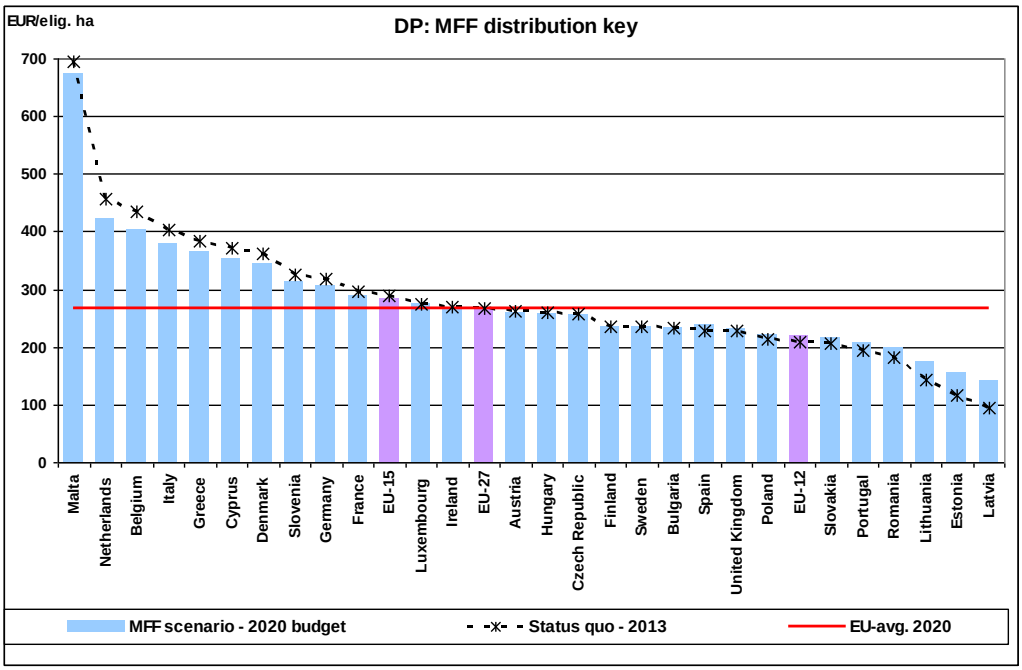
(i) Redistribution of direct payments between Member States

Under this scenario direct payments are redistributed across Member States by adjusting the national envelopes for direct payments for individual Member States. The national envelopes are adjusted using a formula that increases payments to those Member States that currently receive less than 90% of the EU average payment per eligible hectare, reducing the gap between the current figure and 90% of the EU-27 average by one-third. This is financed by proportionally reducing the envelopes of those Member States who are above the EU average.

The formula limits the extent of redistribution across member states and is regarded as more politically acceptable compared to formulae based on objective criteria, which lead to more substantial levels of redistribution (Matthews, 2011). As computed in the impact assessment by the Commission, this formula leads to a redistribution of €738 million compared to a total budget of €42.8 billion (European Commission, 2011b). Figure 1 illustrates the redistributive impacts for individual countries. In percentage terms, the biggest losers are Malta, Netherlands, Belgium, Italy and Greece (below -4%). The national envelopes are also reduced in Germany and France (-2.3% and -1.5% respectively). Latvia, Romania, Estonia and Bulgaria gain significantly from the redistribution (all above 20%). Applying this formula to the UK has a small positive impact on the national envelope (+1.1%).

Under this scenario the direct payments within the modelling system are adjusted based on the figures in the EU Commission study and are phased-in over the period 2014 to 2017.

Figure 1: Redistribution of direct payments between Member States



Source: European Commission (2011)

(ii) Move towards a uniform payment per hectare within Member States

This scenario analyses the impact of uniform per hectare payments within Member States. Within the UK the total current payments are ring-fenced in Wales, Scotland and Northern Ireland, i.e. a unique flat rate is applied in each country in the UK. A tiered flat rate payment system, with different flat rates applying to the SDA moorland, the SDA non-moorland and the non-SDA, is incorporated in the Baseline in England. It is assumed that having already introduced a tiered flat rate payment it is unlikely that Defra would implement a uniform flat rate system in England and thus the payment system for England is not changed in this scenario analysis.

Country specific flat rates for Wales, Scotland and Northern Ireland are computed based on the value of Single Farm Payment receipts and existing eligible hectares. The total value of receipts for different farm types under a flat rate system is derived by multiplying the flat rate payment for each country by the number of eligible hectares for different farm types. It should be noted that this implicitly assumes that there is no change in farm type. In reality, under a decoupled system producers are free to switch to other sectors. Nonetheless, this approach provides a broad indication of how different farm types fare under a flat rate system. In general, there is a redistribution of payments from dairy, cereal and lowland/disadvantaged area cattle and sheep farm types to severely disadvantaged area cattle and sheep farm types. This reflects the extensive nature of cattle and sheep production in the hills, where under the current historic system Single Farm Payment receipts have been relatively low in relation to the area of land utilised.

The changes in payments to farm types are used to adjust the direct premia variables within the suckler cow, ewe, milk production and crop area equations within the FAPRI UK models. A further adjustment is applied to the SDA beef cow and ewe equations (LFA equations in the case of Scotland) based on the area of rough grazing within each country. While these areas gain significantly in terms of increased payments under a flat rate system due to the extensive nature of production, the production response in these areas is constrained by poor land quality. As a result, the production responses in these equations are restricted, taking into account stocking densities and the extent of rough grazing. Further details are provided in Appendix A.

Two versions of this scenario are simulated:

(a) In accordance with the legislative proposals, the flat rate payment is phased in between 2014 and 2019, with 40% of the payment allocated on a single flat rate basis in 2014. This proportion increases equally each year, until it is fully allocated on a flat rate basis in 2019.
(b) The flat rate payment is phased in between 2014 and 2016. Under scenario (ii)a, it may not be possible to capture the full impact of the move to a flat rate payment by the end of the projection period due to dynamic effects which may not fully work through the system until after the end of the projection period. As a result,

the flat rate payment is phased-in over an artificially shortened time period in this version of the scenario to ensure the results better reflect the full impact of the policy change.

Under this scenario, it is assumed that payments that are coupled in the Baseline, including the Scottish Beef Calf Scheme payment, are decoupled following the introduction of the flat rate payment.

For the EU, countries that currently use a historical method to calculate payments are assumed to redistribute these payments to a flat rate. In most cases the impact of this change is small as the single farm payment is treated as largely decoupled in the baseline. However, in the baseline some countries still choose to make beef payments as coupled payments. In this scenario these payments are decoupled and paid as part of the flat rate payment and this accounts for most of the changes at the EU level under this scenario.

(iii) Greening measures

Two sub-scenarios are considered:

(a) Ecological focus areas
(b) Combined greening measures

Under Scenario (iii)a, 7% of the arable area is devoted to ecological focus areas. Within the UK, it is assumed that existing ecological features constitute 2% of the arable area in England, Wales and Scotland; thus, in effect 5% of arable land is taken out of production. It is assumed that existing features make up 2.7% of the arable area in Northern Ireland, thus 4.3% of arable land is taken out of production. Within the modelling system the area of arable land to be taken out of production is incorporated within the crop area equations.

For the EU the estimates for the impact of ecological set-aside are taken from Table 3 of Annex 2D of the Commission's Impact Study (European Commission, 2011a), adjusted for the different rate that was in the Commission's proposal to that used in the Impact Study. The rates used are presented in Table 1.

Table 1: Set-aside rates assumed in the GOLD model as a result of the ecological set-aside measures

	Percentage of crop area
France	3.9
Germany	4.7
Italy	2.4
Other EU-15	1.9
Poland	5.1
Hungary	5.6
Other EU-10	3.4
EU-2	5.2

Accounting for the crop diversification measures [Scenario (iii)b] is difficult to capture within a sector modelling system. For the EU, attempting to analyse the impact of crop diversification is complicated by the plethora of different farming approaches and regions, all of which would result in different responses. In the absence of other detailed analysis of crop area responses to diversification, estimates from Table 8 of the Commission's impact study on changes in area shares are incorporated into the crop share equations (Table 2).

Table 2: Percentage changes to the area share equations based on the Commission Impact Study

	EU-15	EU-12
Wheat	1.7	0.7
Rye	1.2	-0.8
Barley	-3.6	0.1
Maize	-0.1	-2.0
Rapeseed	1.7	-0.1
Sunflower	13.4	2.9
Soybean	5.1	-0.1

Within the UK, agricultural census data on arable areas for each individual farm were obtained for England, Scotland and Northern Ireland and used to inform assumptions about the impact of the crop diversification requirement. Farm Business Survey data are used for Wales, but we are in the process of obtaining Welsh agricultural census data and the analysis will be updated once this information is available. Using these datasets sub-scenarios are undertaken using a combination of different decision rules. The sub-scenarios reflect the uncertainty as to how producers will respond to the crop

diversification measures and differ in terms of whether livestock farms [and mixed farms in the case of sub-scenario (iii)b1] who violate the crop diversification measures will continue to grow areas of arable crops. The decision rules are as follows:

1) Livestock farms with one crop that is not temporary grassland exit crop production;
2) Livestock farms with two crops, one of which is temporary grassland, exit production of the non temporary grassland crop; and
3) Livestock farms with three or more crops, exit production of crops if the acreage of their temporary grassland is greater than 70% arable area.

The implementation of these decision rules within the sub-scenarios is shown in Table 3. The crop diversification measures essentially involve two issues. Firstly, whether there are a sufficient number of crops and secondly the proportion of these crops. The agricultural census data indicate that the violating farms are mainly livestock or mixed holdings that have an insufficient number of crops to meet the diversification requirements. The sub-scenarios that incorporate various combinations of the decision rules assume different flexibilities in the adjustments of the violating livestock/mixed farms. It is assumed that adjustments for other farms cancel out each other[1]. In line with the October 2011 proposals, holdings with arable land less than three hectares are treated as exempt from the crop diversification measures. Under Scenario (iii)b4 it is assumed that livestock farms with two crops, one of which is temporary grassland, choose to grow a third crop to meet the crop diversification measures. It is impossible to know what the third crop would be, so it is assumed that for producers who have barley as an existing crop grow wheat as a third crop and vice versa.

Table 3: Definition of sub-scenarios

	S(iii)b1	S(iii)b2	S(iii)b3	S(iii)b4
Farm Type	Livestock & Mixed	Livestock	Livestock	Livestock
Decision Rules	1, 2 & 3	1, 2 & 3	1 & 2	1

[1] The agricultural census data shows that violating farms with a sufficient number of crops mostly need to make small adjustments. At the aggregate level it is unlikely that these adjustments will disproportionately affect one specific crop *ceteris paribus* and hence it is assumed that the effects cancel each other out.

(iv) Provision of coupled payments

In the proposals Member states can potentially opt for a limited amount of coupled support, with the maximum percentage dependent on the current level of coupled support. There are clearly a great many ways that this could be implemented in practice. There are a large range of options available to member states including supporting different commodities, sub groups like particular animal types or breeds, or using payments in different regions. As the payments will be coupled to production, their impact on commodity markets is potentially large. The two sub-scenarios are analysed:

(a) Provision of coupled payment with no quantitative limit; and

(b) Provision of coupled payment with quantitative limit.

In the absence of detailed plans from the Member States as to how these payments will be made it is necessary to make a simplifying assumption. In Scenario (iv)a it is assumed that all the coupled payments are paid as beef cow direct payments, with countries that currently provide more than 5% of coupled support providing coupled payments that equate to 10% of the National Envelope and 5% otherwise. The decoupled single farm payment is reduced accordingly. In practice it is likely that the payments would be made on a variety of products, for example on sheep, depending on the aims of the particular member states. Within the UK, 5% coupled support is applied to the beef sector in Wales, Scotland and Northern Ireland. No coupled payments are introduced in England.

The coupled payment option is designed to support sectors that experience difficulties and may be subject to quantitative limits. Thus, it may not be possible to make payments on the entire suckler cow herd of a Member State. It is unclear how this may be applied in practice. Under Scenario (iv)b the payment is restricted. Specifically, if the projected cow numbers for the previous year exceed the reference period (average between 2010 and 2012) by 5 per cent then the payment is reduced, limiting the ability of cow numbers to rise above this level.

(v) Combined impact of preceding CAP reforms, plus removal of sugar quotas

Under this scenario the above policy changes [Scenarios (i), (ii)b, (iii)b3 and (iv)b] are incorporated within an overall assessment of the proposed changes to the regulations governing direct payments. In addition, the impact of the proposed ending of sugar quotas under the market management regulations is also taken into account since this may lead to an expansion in sugar area, which has implications on other commodity markets. Changes as a result of the ending of sugar quotas are based on the findings of the LEI/Wageningen report from November 2011 (LEI, 2011), which show an increase in sugar production within the EU of 11% as a result of quota removal. Area changes for individual countries are adjusted as per that study and feed through into the area equations that determine crop and oilseed area. Within the main analysis the crop diversification

decision rules 1 and 2 are implemented for livestock farms (*i.e.* equivalent to greening measures under Scenario (iii)b3). This is referred to as Scenario (v)3. Results that apply alternative decision rules for crop diversification to the combined scenario are presented in Appendix C.

In order to assess the sensitivity of the assumptions regarding the degree to which production is influenced by direct payments Scenario (v)3 is re-simulated using decoupling coefficients of 0.1 and 0.5 (compared to 0.3 in the Baseline). In order to model this appropriately a new Baseline for each of these sensitivity runs is required, but since the payments have been made historically and vary little over time in the absence of policy changes, the recalibrated sensitivity Baselines differ little from the original. In the results, changes due to policy are compared to their recalibrated Baseline equivalent.

4. Results

The results of the CAP-Reform Scenarios are discussed below. Summary tables at the EU-27 level (Tables B1 to B2) and within the UK (Tables B3 to B22) are provided in Appendix B. The sensitivity results for crop diversification and the production stimulating impact of the direct payments for the UK are presented in Appendices C and D respectively.

Scenario (i): Redistribution of direct payments between Member States

The impact of the redistribution of direct payments between Member States at the EU-27 level is negligible; the projected changes in EU-27 livestock numbers and crop areas are all less than 0.5 per cent. In part this reflects the fact that the proposed redistribution is small in most cases (apart from Bulgaria and Romania where the increases in the national envelopes exceed 20 per cent) and at an EU-27 level these changes in each member state offset each other.

The small change is also a result of the way that decoupled payments are represented in the model. For crops, even the old arable area payment was treated as mostly decoupled in that it only entered into the total area share equation at half its commodity price equivalent and the elasticity on total area to returns is small. In converting it to the post-Mid-Term Review direct payment this impact was further reduced by 70 per cent, with the effect that the payment is almost fully decoupled from crop area changes. This approach differs from other models, in particular general equilibrium models that generally model these direct payments as a return to land and therefore changes in direct payments often lead to more substantial changes in crop area (see Binfield *et al.*, 2005b). For livestock, payments are more coupled and there are larger changes in redistribution, but these are offset by the fact that the largest benefactors tend to have small beef herds.

Within the UK, the national envelope for direct payments increases by 1.1 per cent under this scenario. The increase in direct payments, combined with negligible price impacts, is insufficient to significantly stimulate production responses at the UK level. Overall, the projected impact on UK market receipts plus direct payments minus costs is insignificant (+0.2 per cent).

Scenario (ii): Flat rate payment

a) Transition 2014 to 2019

The introduction of a flat rate payment has a minimal impact on most sectors at the aggregate EU-27 level, apart from the beef sector. Within the latter, it is projected that EU-27 beef cow numbers and beef production are 9 per cent and 2 per cent lower respectively at the end of the projection period[2]. This primarily reflects the impact of the removal of coupled payments that supported cattle numbers in some Member States. The decline in EU beef production exerts an upwards impact on the beef price in the latter part of the projection period. Under Scenario (ii)a, the EU beef price is 3.5 per cent higher in 2021 compared to the Baseline.

The positive beef price effect at the end of the projection period is transmitted to the UK. This leads to a small increase in beef cow numbers in England (+1 per cent)[3]. Within Wales, Scotland and Northern Ireland the redistribution of direct payments from the lowlands to the hills following the implementation of a flat rate system has a further impact on beef cow numbers. While the single farm payment is decoupled from production, in line with economic theory it is assumed that it has a partial influence on production and consequently the redistribution of payments impacts livestock numbers. In particular, it is projected that beef cow numbers are 2.0, 10.5 and 3.4 per cent lower in the lowlands in Wales, Scotland and Northern Ireland, respectively (Table 4). This is in line with the more intensive nature of production in the the lowlands, which means that these producers receive lower direct payments following the move to a flat rate system. The impact is more marked in Scotland since, in addition to the redistribution of direct payments, the coupled Scottish Beef Calf Scheme payment is decoupled in this scenario. Similarly, it is projected that beef cow numbers decline, but to a lesser extent, in disadvantaged areas in Wales and Northern Ireland (disadvantaged area land in Scotland is included within the less favoured area category). Despite the overall increase in direct payments in severely disadvantaged areas in Wales and Northern Ireland under a flat rate system, it is projected that beef cow numbers increase by only a small amount in the former (+0.6 per cent) and are unchanged in the latter. The main beneficiaries within severely disadvataged areas are the most extensive producers, who are located on lower quality land where the production response is limited. Within these areas the increase in

[2] The decline in beef production is less marked than that for beef cow numbers since a high proportion of beef animals come from the progeny of the dairy herd on the continent.
[3] Note an area rate payment has already been incorporated in the Baseline in England.

livestock numbers is offset by a decline in numbers on better quality land[4]. In Scotland, Less Favoured Area beef cow numbers are 2.5 per cent lower due to the combined impact of the limited production response on poor grazing land and the decoupling of the Scottish Beef Calf Scheme payment.

Overall, it is projected under Scenario (iv)a that UK beef cow numbers fall by about 1 per cent, leading to a similar decline in UK beef production. Projected UK beef domestic use decreases slightly in response to the higher price.

Table 4: Projected changes in lowland, DA and SDA beef cow numbers in England, Wales, Scotland and Northern Ireland

	S (ii)a	S (ii)b
England		
Lowland	1.0%	2.1%
DA	1.1%	2.3%
SDA	1.2%	2.5%
Total	1.0%	2.2%
Wales		
Lowland	-2.0%	-1.3%
DA	-0.3%	0.8%
SDA	0.6%	2.1%
Total	0.0%	1.3%
Scotland		
Lowland	-10.5%	-10.1%
LFA	-2.5%	-1.4%
Total	-4.0%	-3.1%
Northern Ireland		
Lowland	-3.4%	-2.8%
DA	-2.3%	-1.5%
SDA	-0.1%	0.8%
Total	-1.5%	-0.7%
UK Total	-0.9%	0.2%

The outcome in the sheep sector is similar. It is projected that there is a modest reduction in EU-27 sheepmeat production (-0.9 per cent), with a corresponding increase in price (+1.3 per cent). There is a small fall in sheep numbers as a result of the transition to a flat rate payment at an EU-27 level. The redistribution of direct payments results in a small decline in ewe numbers in the lowlands in Scotland and Northern Ireland and no change in Wales (Table 5). Ewe numbers are projected to increase marginally within

[4] See Appendix A for more information on the weighting scheme used within the SDA equations.

severely disadvantaged areas in Northern Ireland and Less Favoured Areas in Scotland. Within Wales, it is projected that severely disadvantaged area ewes increase by a slightly greater amount (+1.5 per cent) due to the significant redistribution to sheep producers in this region (the positive impact is dampened in areas where the land quality is particularly poor). The positive price effect has a small upward impact on total ewe numbers in England (+1 per cent). The overall impact on UK ewe numbers and sheepmeat production is marginal. Similarly, the knock-on impact on UK domestic use and net exports is minimal.

Table 5: Projected changes in lowland, DA and SDA ewe numbers in England, Wales, Scotland and Northern Ireland

	S (ii)a	S (ii)b
England		
Lowland	0.9%	1.1%
DA	0.9%	1.0%
SDA	1.1%	1.3%
Total	1.0%	1.2%
Wales		
Lowland	0.0%	0.1%
DA	-0.2%	0.0%
SDA	1.5%	1.7%
Total	1.0%	1.2%
Scotland		
Lowland	-1.7%	-1.6%
LFA	0.4%	0.6%
Total	0.2%	0.4%
Northern Ireland		
Lowland	-1.1%	-1.0%
DA	-1.3%	-1.2%
SDA	0.1%	0.3%
Total	-0.4%	-0.3%
UK Total	0.8%	1.0%

Within the dairy sector, it is projected that there is a small decline in UK milk production (-0.3 per cent) following the introduction of a flat rate payment. The impact is most marked in Scotland (Scottish milk production is 1.7 per cent lower at the end of the projection period under Scenario (ii)a compared to the Baseline). Projected milk production falls by -0.5 per cent in Wales and Northern Ireland and remains unchanged in England. Under the current system, Scottish dairy producers attract high per hectare payments relative to other Scottish farm types. Consequently, moving from a historic to a flat rate system results in a particularly large decline in direct payments to Scottish dairy producers. The decline in direct payments, however, results in a modest reduction in

production, partly because the single farm payment represents a small component of overall farm income relative to other farm types. The decline in milk production has a slight downward impact on the number of UK dairy cows (-0.3 per cent in 2021). Note the coefficients embedded within the modelling system are based on historic data and therefore reflect existing farm structures and prevailing technologies. It is difficult to capture the impact of structural changes using these types of models and consequently there are uncertainties regarding the projected production response to such significant redistribution of direct payments.

It is projected that the introduction of a country specific flat rate payment has a limited impact on the crop sector in the UK. Within Wales, Scotland and Northern Ireland the projected declines in wheat, barley and rapeseed areas are small (-0.1 to -1.0 per cent) due to the observed inelastic relationship between returns and area planted.

Overall, the projected impact on market receipts plus direct payments minus costs is small, ranging from -0.2 per cent in Scotland to +1.2 per cent in Wales and Northern Ireland. The decline in dairy market receipts contributes to the larger fall in Scotland. It is projected that the change in total UK market receipts plus direct payments minus costs is minimal (+0.6 per cent). It is important to stress that the models address changes at the aggregate level. There would be significant redistributions of payments at the individual farm level.

b) Transition 2014 to 2016

This scenario also examines the impact of the move to a flat rate system, except the transition period is implemented over a shorter period. The projected fall in EU-27 beef production is slightly greater compared to Scenario (ii)a, which leads to a larger price impact. Under Scenario (ii)b, the EU-27 beef reference price is 6.1 per cent higher at the end of the projection period compared to the baseline (compared to +3.5 per cent under Scenario (ii)a). The positive price impact has a small upward impact on UK beef cow numbers. The projected impacts for the other sectors under this scenario relative to the Baseline are marginal compared to Scenario (ii)a. This indicates that apart from the beef sector the results reported under Scenario (i)a almost fully capture the impacts of the policy change.

Scenario (iii): Greening measures

a) Ecological focus areas

The impacts of ecological focus areas are determined by the assumption that the effective required level of land taken out of production is that determined by the Commission's Impact Study as outlined in Table 1 above. In the model, these adjustments are incorporated within a variable representing the old set-aside that operated prior to the mid-term review and therefore the impact on different crop areas is similar to that which has occurred historically. In practice the measure would work in a way that could potentially have important differences given different requirements, especially by treating rotation of the area differently. In the model, the introduction of ecological focus areas reduces the area and increases prices, which leads to expansion of area elsewhere. Therefore the drop in area is less than the adjustments made in Table 1. Higher prices increase yields, as does the drop in area which is assumed to be taken from marginal areas first.

In Scenario (iii)a total EU-27 crop area decreases by approximately 2 per cent. Yields increase by between 0.2 per cent (barley) and 0.5 per cent (maize). Yield changes are different given the different area response and price response for each of the commodities. The projected decreases in the production of the crops range from 1.2 to 2.2 per cent. The price response of EU cereals depends on the world market response as well as what happens inside the EU. Wheat prices rise 3.9 per cent, while barley and maize prices rise by 4.0 and 3.3 per cent respectively. Oilseed prices quoted in the tables are world prices (FOB Northern Europe) and rise less strongly than grain prices. These prices feed through to the rest of the sectors with biofuels prices rising and EU production of both ethanol and biodiesel dropping slightly, for example.

Higher cereals and oilseed meal prices feed through into the livestock sectors. EU-27 cattle, pig and sheep numbers all fall as do production of meats. Price increases are largest for those meats that use grain/meal most intensively, with pig prices rising 1.5 per cent and poultry prices rising 1.6 per cent.

The projected increase in EU-27 crop prices are transmitted to the UK, with UK wheat, barley and rapeseed prices increasing by 3.8 per cent, 3.9 per cent and 1.3 per cent respectively. Projected wheat, barley and rapeseed areas decline by just under 5.0 per cent. The impact is slightly less marked for rapeseed (-3.7 per cent), compared to wheat (-4.9 per cent) and barley (-4.8 per cent) due to relative differences in profitability. Under this greening measure, crop yields increase slightly as producers take out of production the least productive land. As a consequence, crop production does not fall to the same extent as area. The increase in crop prices lead to small reductions in domestic use. The projected declines in crop production exceed that for domestic use and hence, net exports decline.

Similar to the rest of the EU, the projected increase in crop prices has a knock-on impact on the livestock sectors. The projected increases in crop prices exert an upward impact on livestock production costs, but these are largely offset by higher meat output prices. Consequently, the impact on UK meat production is small. The limited increase in output prices leads to commensurate reductions in UK meat domestic use.

In terms of market receipts, it is projected that price responses do not offset the impact on production and crop receipts decline (UK crop market receipts are 1.1 per cent lower). This is partially offset, however, by an increase in livestock market receipts. Overall, projected UK market receipts plus direct payments minus costs are 0.6 per cent lower under Scenario (iii)a compared to the Baseline in 2021.

b) Combined greening measures

The impact of the crop diversification requirements are difficult to analyse, given the wide range of production systems and farm sizes that exist across the EU. In practice the changes would have a different impact in each of these situations. In the absence of more detailed farm level analysis the information that is provided in the Commission Impact study as presented in Table 2 is utilised within the FAPRI-Missouri EU model. The adjustments in Table 2 are incorporated into the share equations in the models. This involves reallocating area between oilseed and crop areas based on the regional aggregate shares and then changing the relative shares of the crops themselves. The models are then solved to generate a new equilibrium. The subsequent feedback through the model and the price changes generated by the ecological set aside mean that the net impact on crop areas will be different from that in Table 2. This reflects the fact that if many farms are forced to reduce area of a particular crop, its price will rise and area will expand elsewhere, on farms with fewer restrictions. Clearly the analysis is very sensitive to the adjustments in Table 2 and it should be remembered that there is a high degree of uncertainty regarding these impacts.

In the first year of the crop diversification measures taking effect, area shifts strongly from cereals (particularly from barley and durum) into oilseeds whose area actually increases. The changes in production that result impact relative prices and thereafter the impact of the measures are reduced, so that by 2021 only soybeans is showing an (small) increase in area[5]. Relative to Scenario iii(a) barley area decreases the most, an additional 230 thousand hectares. Maize is reduced by a further 98 thousand hectares, while soft wheat area increases offset some of the durum area reduction and total wheat area falls by 47 thousand hectares.

[5] The following figures for the EU are based on Scenario (iii)b3. At the EU-level the changes in crop area for the other sub scenarios (i.e. (iii)b1, (iii)b2 and (iii)b4) are very close to those based on Scenario (iii)b3 since the sub-scenarios relate to changes at the UK-level.

In contrast to cereals, oilseed area in Scenario iii(b) increases. Rapeseed area increases by 97 thousand hectares, while sunflower area grows by proportionately more at 86 thousand hectares. Soybean area is up 38 thousand hectares and is actually above its baseline level. These results reflect the finding of the European Commission report upon which it is based, that cereals area will be replaced by oilseed area. Most of the adjustment occurs in the old EU-15 countries.

For England, Wales, Scotland and Northern Ireland agricultural census and farm business survey data are used to assess the impact of the crop diversification measures. Using the decision rules outlined in Section 3, these datasets are used to generate adjustments in the areas of arable land affected by this greening measure in sub-scenarios (iii)b1 to (iii)b4. These adjustments are incorporated within the UK crop area equations and solved to generate a new equilibrium, which again takes account of responses to changes in price.

Applying these decision rules leads to a further decline in total UK crop area. The decline is greatest under sub-scenario (iii)b1 since it is assumed that both livestock and mixed farms no longer grow small areas of arable crops if they violate the crop diversification measures. Compared to Scenario (iii)a, it is projected that total UK area falls by a further 3.5 per cent. The decline in total crop area is most marked in Wales (-26.5 per cent compared to Scenario (iii)a) and Northern Ireland (-24.6 per cent compared to Scenario (iii)a) since a large proportion of the arable land within these regions is farmed by livestock producers for feed purposes. Barley is affected to a greater extent than the other crops since it is the main crop grown for home feed purposes on livestock holdings. The changes in crop production reflect the reductions in crop areas.

The reductions in total UK crop area become progressively smaller under the subsequent sub-scenarios as the decision rules become less stringent. The reduction in total crop area diminishes under Scenario (iii)b2 when it is assumed that only livestock farms take land out of arable production, *i.e.* mixed farms continue to grow arable crops. The projected changes in crop areas are similar under Scenario (iii)b2 compared to Scenario (iii)b3 since relatively few farms are affected by the third decision rule (livestock farms with three or more crops, exit production of other crops if the acreage of their temporary grassland is greater than 70% arable area). In contrast, more significant changes are apparent when Scenario (iii)b4 is compared to Scenario (iii)b3. Under Scenario (iii)b4 it is no longer assumed that livestock farms with two crops, one of which is temporary grassland, exit production of the non temporary grassland crop. Under this scenario these farms opt to diversify, thereby reducing the decline in the total area of arable crops. Moreover, it is projected that there is a marked shift in the crop mix from barley to wheat in Scotland and Northern Ireland. This shift to wheat production is questionable since barley tends to be grown on land where growing conditions are more difficult and less favourable for wheat.

The sub-scenarios in this analysis reflect the uncertainty regarding the potential impact of crop diversification. Two identical farms may behave differently in response to this greening measure. Applying different decision rules using farm level data provides a broad indication of the potential range of impacts this measure may have on the crop sector.

The impacts of these sub-scenarios on livestock numbers are similar to the Scenario (iii)a. Although feedstuff costs increase slightly in line with the changes to crop prices, these effects are relatively small and are offset by slight increases in meat output prices. Overall, following the combined impact of the greening measures on agricultural income (UK market receipts plus direct payments minus costs) compared to the Baseline at the end of the projection period range from minus 0.5 per cent under Scenario (iii)b4 to minus 1.2 per cent under Scenario (iii)b1.

Scenario (iv): Coupled payment

a) No quantitative limit

Analysis of the re-coupling of direct payments is difficult since some member states are already operating re-coupled programs under Article 68 and these are not incorporated in the baseline. In addition, it is likely that if the reforms were to be enacted then Member States would use varying proportions of their allowed expenditure and spend this in different ways over alternative regions or products.

As a result of these assumptions beef cow numbers in the EU-27 are 10 per cent higher under this scenario compared to the Baseline in 2021. This equates to an increase in EU-27 beef cow numbers of 18 per cent between the reference period used in this study (average of 2010 to 2012) and 2021, with an even greater expansion in some Member States. In practice, the coupled payments may be subject to quantitative limits. This is explored further in Scenario (iv)b. Since beef cows are only a proportion of the beef producing herd beef production is only up 2.6 per cent. The EU-27 beef price is down 5.2 per cent by the end of the projection period. In the short-run, the projected beef price actually increases slightly due to a decrease in cow slaughterings and an increase in the number of heifers that are bred, which initially leads to a decrease in EU slaughterings. In the long-run, the prices of other meats fall as a result of competition from beef. The changes in meat production feed through into the crop sectors but the changes are too small to observe.

Similar to the rest of the EU, the UK beef price initially increases in the short-run, but decreases in the latter part of the projection period. At the end of the projection period, under Scenario (iv)a the UK beef price is 5 per cent lower than the Baseline in 2021. It is assumed that no coupled payments are provided in England and consequently, the

reported impacts in England reflect the projected changes in the beef price. Consequently, there is small increase in English beef cow numbers in the short-run, followed by a decrease. By the end of the projection period, English beef cow numbers are 1.5 per cent lower.

The re-introduction of beef cow payments in Wales and Northern Ireland, however, has a positive impact on beef cow numbers. Despite the price impact, under Scenario (iv) it is projected that Welsh beef cow numbers are 3.2 per cent higher in 2021 compared to the Baseline, while Northern Irish beef cows are 2.1 per cent higher. The impact is greater in Wales compared to Northern Ireland since the payment per beef cow is slightly greater in the former. Within Scotland, it is projected that beef cow numbers are 0.4% lower under Scenario (iv)a compared to the Baseline in 2021. While the existing coupled Scottish Beef Calf Scheme payment is included in the Baseline, the overall payment under this scenario is slightly higher compared to the Baseline (€32.4 million compared to €29.8 million). In addition, the old Scottish Beef Calf Scheme payment was solely funded from beef payments, which reduced the value of the decoupled direct payments for beef producers by 10%. Under the reforms the fact that the single farm payment will be paid on a flat rate basis means that it will no longer be possible to obtain funding for the coupled payment from a particular sector and consequently, the direct payments for all sectors will be proportionately reduced by the same amount (minus 5%), diminishing the reduction to the beef sector. This helps to partially offset the negative price effect.

Overall, UK beef production increases slightly at the end of the projection period (+1.1 per cent). The reduction in the beef price also leads to an increase in UK domestic use (+1.2 per cent)[6].

Within the other livestock sectors, the UK output prices in the sheep, pig and poultry sectors follow the rest of the EU, leading to slightly lower prices. The knock-on impact on UK sheepmeat, pig and poultry production is small (ranging from -0.2 to -0.3 per cent).

At the UK-level, the increase in production does not compensate for the price response and it is projected that beef market receipts decline. Overall, UK market receipts plus direct payments minus costs are projected to be 1.1 per cent lower under Scenario (iv) compared to the Baseline at the end of the projection period.

[6] The model was also simulated with no change in the other EU countries, *i.e.* the coupled payment is just provided in Wales, Scotland and Northern Ireland. Under these circumstances, it is projected beef cow numbers increase by 4.9, 0.9 and 3.2 per cent in Wales Scotland and Northern Ireland, respectively. This indicates the potential impact of the coupled payment without the negative price effect. As there is uncertainty about whether Member States will opt for the coupled payments, the results presented here provide a range of the possible outcomes.

b) Quantitative limit

Under this scenario, the coupled payment is reduced if projected cow numbers for the previous year exceed the reference period (average between 2010 and 2012) by 5 per cent. The application of quantitative limits leads to a less significant expansion at the EU-level. At the end of the projection period, EU-27 beef cow numbers are 5.3 per cent higher under Scenario (iv)b compared to the Baseline. The less marked expansion in EU-27 beef production means that the price does not fall to the same extent (-3.7 per cent). In response to the smaller price impact it is projected that the declines in English and Scottish beef cows are slightly smaller, while the expansions in Wales and Northern Ireland are slightly greater. Note, however, the quantitative limits are not triggered in the UK.

Scenario (v): Combined reforms including sugar quota abolition

[Combines Scenarios (i), (ii)b, (iii)b3 and (iv)b. See Appendix C for sensitivity analysis for different crop diversification rules and Appendix D for different direct payment production stimulating coefficients.]

The Commission's proposals also include the ending of sugar quotas. For the purposes of this report, changes in the sugar sector as a result of this are based on the findings of the LEI/Wageningen report from November 2011 (LEI, 2011) which show an increase in sugar production within the EU of 11 per cent as a result of quota removal. Area changes for individual countries are adjusted as per that study and feed through into the area equations that determine crop and oilseed area. For the EU, changes in sugar area within each country or country group are assumed to be equally distributed across crops. Within the UK it is assumed that sugar area increases by about 10 per cent as per the report. It is assumed that the expansion in sugar area has a slightly greater impact on rapeseed area compared to cereals.

For the EU-27 the majority of the impact of incorporating the sugar reforms can be seen by comparing the results of Scenario (v)3 with Scenario (iii)b3 since the impact of Scenario (iv) on the crop sector is negligible. The sugar reforms see a small fall in area for each of the crops with the exception of soybeans. Although within each modelled region any change in sugar area is distributed amongst different crops, the change in sugar area is different for each region so the aggregate effect on each crop varies. For the UK it is projected that the barley area is 0.2 per cent lower under Scenario (v) compared to Scenario (iii)b, while the rapeseed area is 0.8 per cent lower.

In Scenario (v), reductions in crop areas from the greening measures and to a lesser extent the reforms in the sugar sector lead to an increase in all crop prices. Re-coupling direct payments has a stimulating impact on beef production, which has a downward impact on beef prices. This is partially offset by the higher feed prices in this scenario with the effect that the reduction in the beef price is less marked compared to the previous scenario; all the other meat prices are up slightly.

In terms of livestock numbers, the higher UK crop prices due to the greening measures exert a downward impact, but there is a compensating increase in price. The compensating increase in price is not evident in the beef sector due to the re-coupled payment impact. The provision of coupled payments combined with the price effect lead to different effects in the UK, with beef cow numbers increasing slightly in Wales and Northern Ireland, but declining in Scotland and England.

In terms of markets receipts, the crop sector and the beef sector in the UK experience the greatest declines (-3.0 per cent and -2.1 per cent respectively). The decline in the crop sector reflects the projected decrease in production as a result of the greening measures, while the fall in the beef sector reflects the impact of the re-coupled payments on the beef price. Overall under the combined reforms it is projected that UK market receipts plus direct payments minus costs are 1.4 per cent lower under Scenario (v) compared to the Baseline at the end of the projection period.

5. Conclusions

This study examines the aggregate impacts of the main elements of the of the October 2011 legislative CAP reform proposals, including redistribution of direct payments between Member States, move to flat rate payments, greening measures and reintroduction of coupled payments. The projected impact on EU-27 production of the proposed redistribution of direct payments between Member States is limited. Over the past 25 years the EU has switched its agricultural support mechanisms from market based tools to supports mostly in the form of direct payments to farmers. Although economic theory indicates that these payments still influence production decisions it is felt that their influence is much smaller than equivalent movements in market prices. It is not surprising, therefore, that the redistribution of direct payments has little overall impacts on markets. Within the UK, it is projected that the small increase in direct payments has a negligible impact on production.

The move to a flat rate payment has a small impact at the overall UK level. This is partly because England has already moved to a flat rate system. Within Wales, Scotland and Northern Ireland, the introduction of a flat rate system leads to the redistribution of payments from the lowlands to the hills. However, the main beneficiaries within the hills are the more extensive producers, who are located on lower quality land where the production response is limited. Consequently, the impact of the flat rate payment on aggregate livestock numbers is small. It is important to stress that there would be significant redistributions of payments at the individual farm level. While this study analysed the impact of a uniform flat rate payment, more complex proposals involve models that ring-fence payments according to different land categories. The results outlined in this paper provide a broad indication of potential aggregate production impacts resulting from moves to flatter payment system. The ring-fencing of payments

according to land category would diminish the redistribution of payments from the lowlands to the hills and thereby reduce the potential impact of a flat rate system.

For the crop sector the most important changes come from the 'greening' proposals and these are the most difficult to analyse. Within the UK, agricultural census and farm business survey data are used to assess the impact of the crop diversification requirements. Various decision rules regarding the behaviour of livestock and mixed farms are considered in this analysis and highlight the potential range of the impact these greening measures may have on the crop sector. In general, the impact is most marked in Wales and Northern Ireland since a large proportion of the arable land within these regions is farmed by livestock producers for feed purposes.

The re-coupling of payments strengthens the market effects of direct payments. This is the intention of allowing some payments to be re-coupled. The assumption incorporated in the analysis underlying this report that the re-coupled payment is solely used to support the beef sector is not entirely in the spirit of the proposals where this measure is meant to be applied regionally. In practice the payments would be spread over a variety of commodities reflecting the different challenges faced by regions confronted with decreasing agricultural production. Nevertheless, the results indicate that the impacts of the reforms on the UK agricultural sector are partially dependent on the coupling options implemented elsewhere.

The reform process continues and the final agreement is likely to differ from the policy changes considered here. This report cannot fully anticipate the contents of the final agreements, nor is it designed to advocate particular changes.

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Appendix A: Weighting Scheme for SDA Beef Cow and Ewe Equations

While the single farm payment is decoupled, it is assumed that it has a partial influence on production (30 per cent compared to the old coupled payments; see Section 2). As a consequence, the redistribution of direct payments from the lowlands to the hills following the switch from a historic to an area based system will lead to a production adjustment.

At the individual level, whether and how much a producer gains or loses depends on the intensity of production. Extensive producers (*i.e.* farms with low stocking densities) benefit following the move from the current historic system to an area payment since the historic single farm payments are low relative to the area of land utilised. In contrast, more intensive producers with better quality land will lose following the change in system since higher stocking densities attract higher payments per hectare under the historic system. Adjustments across different farms will be heterogeneous due to heterogeneity in stocking densities, which are influenced by land quality.

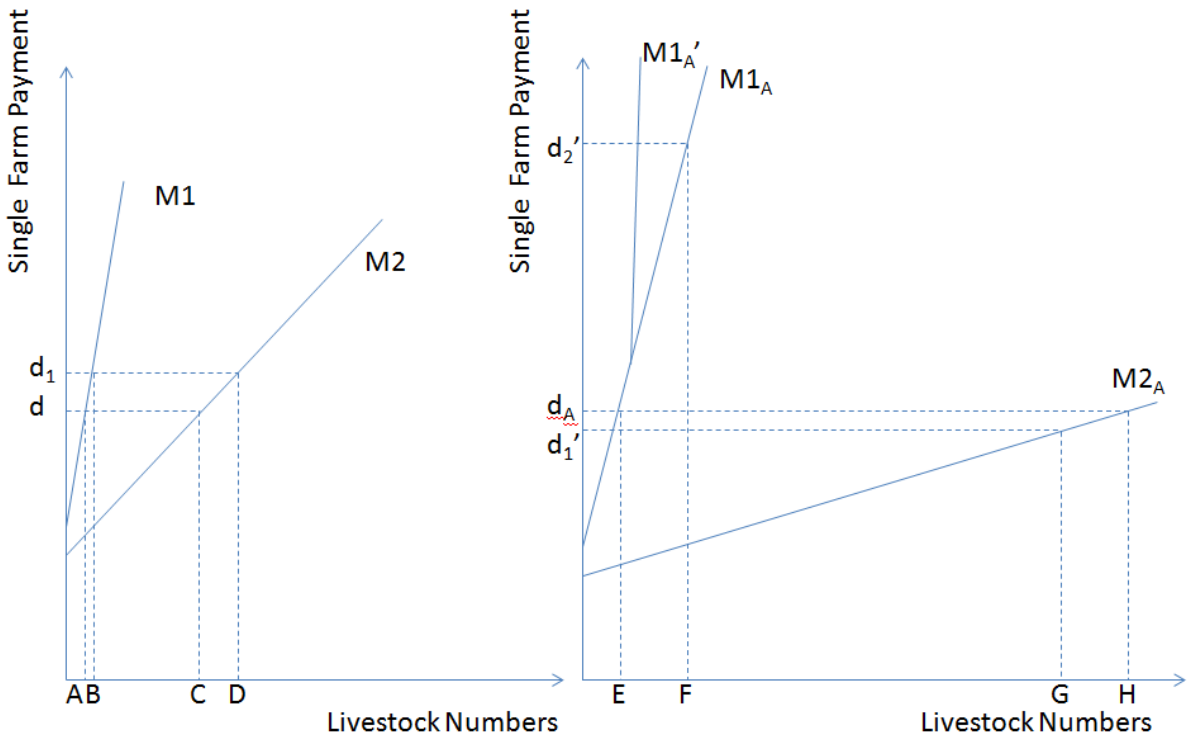
Within the FAPRI-UK model, beef and sheep production is modelled based on three broad types of land: lowland; disadvantaged area and severe disadvantaged area. To assess the impacts of the policy changes on these lands, the heterogeneity in farm responses needs to be taken into account when there exists substantial heterogeneity within these individual categories. This is particularly the case for severely disadvantaged area land, which is heterogeneous, containing some land which is of reasonably good quality (almost as good as disadvantaged area) and other land that is significantly inferior compared to disadvantaged area land (*e.g.* rough grazing land). Many farms on non-rough grazing are likely to receive lower direct payments under an area based system and consequently reduce production. In contrast, farms on rough grazing land are more likely to benefit from the change and expand production. Consequently, at the aggregate level, although there may be a significant redistribution of payments to the severely disadvantaged area category following the implementation of the reforms, this will not lead to an increase in production if the positive production impact within the poor grazing land is more than offset by the negative effect on the better grazing land.

In implementing the scenario that examines the impact of the flat rate decoupled payment, an unequal weighting (rather than a equal weighting) scheme is used in calculating the change in payment. The unequal weighting is based on two factors: (i) relative production scales on the rough grazing land and the non rough grazing land; and (ii) the productivities of these lands.[7] The concept underlying this weighting scheme is further demonstrated in Figure 1. M1 and M2 on the left panel of the figure represent the production response functions to the single farm payment for a farm on rough grazing land and a farm on non-rough grazing land respectively, where M1 is more inelastic than M2.

[7] Land within SDA is disaggregated into four types for Scotland due to the availability of more detailed data, but the weighting method is essentially the same.

Thus, the same increase in the single farm payment (*e.g.* from d to d_1) leads to a smaller expansion in production on the farm with rough grazing land compared to non-rough grazing land (AB compared to CD) because of higher production costs. Furthermore, the difference in steepness is larger when the response functions of farms on the same type of land are aggregated ($M1_A$ versus $M2_A$ on the right panel of Figure 1, because most of the production occurs on the non-rough grazing land. Suppose there is a small reduction (from d_A to d_1') in payment to farms on the non rough grazing land and as a result production decreases by the amount of GH. To fully offset this decline in production, it would require an increase of (d_2'-d_A) to stimulate production expansion on the less productive land. It is still possible that the reduction is only partially compensated when the expansion is limited by production potential (in the case of $M1_A$').

Figure 1: Response function of production to single farm payment at the individual farm level (left) and the aggregate level (right)



Appendix B: Summary Results Tables – Scenarios (i) to (v)

Tables B1 to AB2 – Projected changes in the EU-27

Table B1: Projected Changes in the Livestock Sectors in the EU-27, percentage difference in 2021 compared to the Baseline

	S (i)	S (ii)		S (iii)					S (iv)		S (v)
		a	b	a	b(1)	b(2)	b(3)	b(4)	a	b	(3)
Cattle											
Beef cows	0.2%	-9.0%	-10.5%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	9.6%	5.3%	5.1%
Dairy cows	0.0%	0.0%	0.0%	-0.3%	-0.6%	-0.5%	-0.5%	-0.5%	0.0%	0.0%	-0.6%
Total Cattle	0.1%	-3.2%	-3.9%	-0.2%	-0.4%	-0.4%	-0.3%	-0.3%	3.6%	2.0%	1.7%
Production	0.0%	-1.7%	-2.9%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	2.6%	1.8%	1.4%
Price	-0.1%	3.5%	6.1%	0.8%	1.3%	1.3%	1.3%	1.2%	-5.2%	-3.7%	-2.3%
Sheep											
Ewes	0.0%	-0.7%	-0.6%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-1.1%
Total Sheep	0.0%	-0.8%	-0.8%	-0.2%	-0.3%	-0.3%	-0.3%	-0.2%	-0.1%	-0.1%	-1.3%
Production	0.0%	-0.9%	-0.7%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.1%	-0.1%	-1.3%
Price	0.0%	1.3%	1.4%	0.6%	0.9%	0.8%	0.8%	0.8%	-0.4%	-0.3%	1.6%
Pig											
Sows	0.0%	0.2%	0.4%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.2%	-0.6%
Total pigs	0.0%	0.2%	0.4%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.2%	-0.6%
Production	0.0%	0.2%	0.4%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.2%	-0.5%
Price	0.0%	0.4%	0.5%	1.5%	2.4%	2.3%	2.3%	2.2%	-0.6%	-0.4%	2.1%
Poultry											
Production	0.0%	0.2%	0.4%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.2%	-0.6%
Price	0.0%	0.4%	0.6%	1.6%	2.4%	2.3%	2.3%	2.2%	-0.6%	-0.4%	2.1%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B2: Projected Changes in the Crop Sector in the EU-27, percentage difference in 2021 compared to the Baseline

	S (i)	S (ii)		S (iii)					S (iv)		S (v)
		a	b	a	b(1)	b(2)	b(3)	b(4)	a	b	(3)
Area											
Wheat	0.0%	0.0%	0.0%	-1.9%	-2.2%	-2.1%	-2.1%	-2.1%	0.0%	0.0%	-2.3%
Barley	0.0%	0.0%	0.0%	-1.9%	-4.1%	-3.9%	-3.9%	-3.7%	0.0%	0.0%	-4.1%
Maize	0.0%	0.0%	0.0%	-1.7%	-2.8%	-2.8%	-2.8%	-2.8%	0.0%	0.0%	-2.8%
Rapeseed	0.0%	0.2%	0.2%	-1.9%	-0.5%	-0.5%	-0.5%	-0.4%	0.0%	0.0%	-0.7%
Soybean	0.0%	0.2%	0.2%	-2.2%	7.6%	7.7%	7.7%	7.8%	0.0%	0.0%	7.5%
Sunflower	0.0%	0.2%	0.1%	-2.2%	-0.3%	-0.2%	-0.2%	-0.1%	0.0%	0.0%	-0.3%
Yield											
Wheat	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%	0.4%	0.4%	0.0%	0.0%	0.4%
Barley	0.0%	0.0%	0.0%	0.2%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%
Maize	0.0%	0.0%	0.0%	0.5%	0.9%	0.9%	0.9%	0.9%	0.0%	0.0%	0.9%
Rapeseed	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%
Soybean	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	2.0%	2.0%	0.0%	0.0%	2.0%
Sunflower	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.3%	-0.3%	-0.3%	0.0%	0.0%	-0.3%
Production											
Wheat	0.0%	0.0%	0.0%	-1.6%	-1.8%	-1.8%	-1.8%	-1.7%	0.0%	0.0%	-1.9%
Barley	0.0%	0.0%	0.0%	-1.7%	-4.0%	-3.9%	-3.8%	-3.6%	0.0%	0.0%	-3.9%
Maize	0.0%	0.0%	0.0%	-1.2%	-1.9%	-1.9%	-1.9%	-1.9%	0.0%	0.0%	-2.0%
Rapeseed	0.0%	0.2%	0.2%	-1.9%	-0.5%	-0.5%	-0.4%	-0.3%	0.0%	0.0%	-0.7%
Soybean	0.0%	0.2%	0.2%	-2.2%	9.8%	9.9%	9.9%	10.0%	0.0%	0.0%	9.7%
Sunflower	0.0%	0.2%	0.2%	-2.1%	-0.6%	-0.5%	-0.5%	-0.4%	0.0%	0.0%	-0.6%
Price											
Wheat	0.0%	0.0%	0.0%	3.9%	5.0%	4.8%	4.8%	4.6%	0.0%	0.0%	5.2%
Barley	0.0%	0.0%	0.0%	4.0%	7.6%	7.3%	7.2%	6.9%	0.0%	0.0%	7.7%
Maize	0.0%	0.0%	0.0%	3.3%	5.2%	5.1%	5.0%	4.9%	0.0%	0.0%	5.5%
Rapeseed	0.0%	-0.1%	-0.1%	1.3%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.3%
Soybean	0.0%	0.0%	0.0%	0.3%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%
Sunflower	0.0%	-0.1%	-0.1%	1.0%	0.2%	0.2%	0.2%	0.1%	0.0%	0.0%	0.2%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Tables B3 to B6 – Projected changes in England

Table B3: Projected Changes in the Livestock Sectors in England, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Cattle											
Beef cows	0.1%	1.0%	2.2%	0.1%	0.2%	0.2%	0.2%	0.2%	-1.5%	-1.3%	-0.9%
Dairy cows	0.0%	0.0%	0.0%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	0.0%	0.0%	-0.4%
Total Cattle	0.0%	0.2%	0.5%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.3%	-0.3%	-0.4%
Production	0.0%	-0.3%	-0.3%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.5%	0.2%	0.0%
Sheep											
Ewes	0.1%	1.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	0.7%
Total Sheep	0.1%	0.9%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	0.7%
Production	0.0%	0.5%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.8%
Pig											
Sows	0.0%	0.3%	0.4%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	-0.4%	-0.3%	-0.3%
Total pigs	0.0%	0.3%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.4%	-0.3%	-0.3%
Production	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	-0.2%
Poultry											
Poultry production (EW)	0.0%	0.2%	0.3%	0.9%	1.3%	1.3%	1.3%	1.2%	-0.2%	-0.2%	1.2%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B4: Projected Changes in the Dairy Sector in England, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Milk											
Milk production	0.0%	0.0%	0.0%	-0.3%	-0.5%	-0.5%	-0.4%	-0.4%	0.0%	0.0%	-0.5%
Dairy cows	0.0%	0.0%	0.0%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	0.0%	0.0%	-0.4%
Milk yield per cow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milk price	0.0%	0.0%	0.0%	0.3%	0.5%	0.5%	0.5%	0.4%	0.0%	0.0%	0.5%
Liquid consumption (EW)	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.1%
Manufacturing use (EW)	0.1%	-0.2%	-0.2%	-0.8%	-1.0%	-1.0%	-1.0%	-0.9%	0.0%	0.0%	-1.2%
Production (EW)											
Cheese	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.2%
Butter	0.0%	-0.1%	-0.1%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.0%	0.0%	-0.4%
SMP	0.3%	-1.0%	-1.1%	-1.7%	-2.1%	-2.0%	-2.0%	-1.9%	-0.1%	-0.1%	-3.0%
WMP	0.3%	-1.0%	-1.1%	-1.5%	-1.6%	-1.6%	-1.5%	-1.5%	-0.1%	-0.1%	-2.5%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B5: Projected Changes in the Crop Sector in England, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Area											
Wheat	0.0%	0.0%	0.0%	-4.9%	-6.2%	-5.4%	-5.3%	-4.9%	0.0%	0.0%	-5.3%
Barley	0.0%	0.0%	0.0%	-4.9%	-10.5%	-8.8%	-8.1%	-5.7%	0.0%	0.0%	-8.1%
Rapeseed	0.0%	0.0%	0.0%	-3.7%	-4.8%	-5.7%	-5.4%	-4.3%	0.0%	0.0%	-6.2%
Total	0.0%	0.0%	0.0%	-4.6%	-6.7%	-6.2%	-5.9%	-5.0%	0.0%	0.0%	-6.1%
Yield											
Wheat	0.0%	0.0%	0.0%	0.5%	0.7%	0.6%	0.6%	0.5%	0.0%	0.0%	0.6%
Barley	0.0%	0.0%	0.0%	0.4%	0.9%	0.8%	0.7%	0.6%	0.0%	0.0%	0.8%
Rapeseed	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%	0.4%
Production											
Wheat	0.0%	0.0%	0.0%	-4.4%	-5.5%	-4.9%	-4.7%	-4.4%	0.0%	0.0%	-4.7%
Barley	0.0%	0.0%	0.0%	-4.5%	-9.7%	-8.1%	-7.4%	-5.2%	0.0%	0.0%	-7.4%
Rapeseed	0.0%	0.0%	0.0%	-3.4%	-4.6%	-5.4%	-5.1%	-4.1%	0.0%	0.0%	-5.8%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B6: Projected Changes in the Market Receipts Costs and Direct Payments in England, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Market receipts											
Wheat	0.0%	0.0%	0.0%	-0.9%	-1.1%	-0.4%	-0.3%	-0.1%	0.0%	0.0%	0.2%
Barley	0.0%	0.0%	0.1%	-1.1%	-4.0%	-2.0%	-1.3%	1.5%	0.0%	0.0%	-0.7%
Oats	0.0%	0.0%	0.0%	-2.2%	-1.7%	-0.8%	-0.6%	0.1%	0.0%	0.0%	-0.2%
Rapeseed	0.0%	-0.1%	-0.1%	-2.1%	-4.2%	-5.0%	-4.7%	-3.9%	0.0%	0.0%	-5.3%
Total Crops	0.0%	0.0%	0.0%	-1.3%	-2.5%	-2.1%	-1.8%	-1.0%	0.0%	0.0%	-1.6%
									0.0%	0.0%	0.0%
Cattle	0.0%	3.0%	5.6%	0.6%	1.0%	0.9%	0.9%	0.9%	-4.5%	-3.3%	-2.2%
Pig	0.0%	0.6%	0.9%	1.5%	2.3%	2.2%	2.2%	2.1%	-0.9%	-0.6%	1.8%
Sheep	0.0%	1.6%	2.1%	0.5%	0.7%	0.7%	0.7%	0.7%	-0.4%	-0.3%	2.1%
Poultry	0.0%	0.6%	0.9%	2.5%	3.8%	3.7%	3.6%	3.5%	-0.8%	-0.6%	3.4%
Total Livestock	0.0%	1.5%	2.6%	1.4%	2.1%	2.1%	2.0%	2.0%	-2.0%	-1.4%	1.0%
Milk	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Market Receipts	0.0%	0.6%	1.1%	0.2%	0.2%	0.3%	0.4%	0.6%	-0.9%	-0.6%	0.0%
Costs											
Feedstuffs	0.0%	0.1%	0.2%	3.4%	5.0%	4.8%	4.7%	4.6%	-0.1%	-0.1%	5.0%
Seeds & loses	0.0%	0.0%	0.0%	2.7%	3.3%	3.1%	3.0%	2.7%	0.0%	0.0%	3.3%
Payments											
Direct Payments	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Market Receipts + Payments-costs	0.2%	0.7%	1.2%	-0.7%	-1.1%	-1.0%	-0.9%	-0.6%	-0.9%	-0.7%	-1.2%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Tables B7 to B10 – Projected changes in Wales

Table B7: Projected Changes in the Livestock Sectors in Wales, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Cattle											
Beef cows	0.1%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	3.5%	2.6%
Dairy cows	0.0%	-0.5%	-0.5%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.7%
Total Cattle	0.1%	-0.5%	-0.1%	-0.1%	-0.2%	-0.2%	-0.2%	-0.1%	1.8%	1.7%	1.0%
Production	0.1%	-1.0%	-1.0%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	2.5%	2.2%	1.4%
Sheep											
Ewes	0.1%	1.0%	1.2%	0.1%	0.0%	0.0%	0.0%	0.1%	-0.6%	-0.5%	0.5%
Total Sheep	0.1%	0.9%	1.1%	0.1%	0.0%	0.0%	0.0%	0.1%	-0.6%	-0.5%	0.5%
Production	0.1%	0.5%	0.9%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.4%	-0.4%	0.4%
Pig											
Sows	0.0%	0.3%	0.4%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.4%	-0.3%	-0.3%
Total pigs	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.4%	-0.3%	-0.3%
Production	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	-0.2%
Poultry											
Poultry production (EW)	0.0%	0.2%	0.3%	0.9%	1.3%	1.3%	1.3%	1.2%	-0.2%	-0.2%	1.2%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B8: Projected Changes in the Dairy Sector in Wales, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Milk											
Milk production	0.0%	-0.5%	-0.5%	-0.2%	-0.3%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.8%
Dairy cows	0.0%	-0.5%	-0.5%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.7%
Milk yield per cow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milk price	0.0%	0.0%	0.0%	0.3%	0.5%	0.5%	0.5%	0.4%	0.0%	0.0%	0.5%
Liquid consumption (EW)	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.1%
Manufacturing use (EW)	0.1%	-0.2%	-0.2%	-0.8%	-1.0%	-1.0%	-1.0%	-0.9%	0.0%	0.0%	-1.2%
Production (EW)											
Cheese	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.2%
Butter	0.0%	-0.1%	-0.1%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.0%	0.0%	-0.4%
SMP	0.3%	-1.0%	-1.1%	-1.7%	-2.1%	-2.0%	-2.0%	-1.9%	-0.1%	-0.1%	-3.0%
WMP	0.3%	-1.0%	-1.1%	-1.5%	-1.6%	-1.6%	-1.5%	-1.5%	-0.1%	-0.1%	-2.5%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B9: Projected Changes in the Crop Sector in Wales, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Area											
Wheat	0.0%	-0.1%	-0.1%	-4.5%	-16.7%	-16.7%	-14.8%	-10.2%	0.0%	0.0%	-14.9%
Barley	0.0%	-0.1%	-0.1%	-4.6%	-47.0%	-47.0%	-45.8%	-41.8%	0.0%	0.0%	-45.8%
Total	0.0%	-0.1%	-0.1%	-4.6%	-31.1%	-31.1%	-29.5%	-25.2%	0.0%	0.0%	-29.6%
Yield											
Wheat	0.0%	0.0%	0.0%	0.7%	2.0%	2.0%	1.8%	1.3%	0.0%	0.0%	1.8%
Barley	0.0%	0.0%	0.0%	0.4%	2.4%	2.4%	2.3%	2.1%	0.0%	0.0%	2.3%
Production											
Wheat	0.0%	-0.1%	-0.1%	-3.9%	-15.0%	-15.0%	-13.2%	-9.0%	0.0%	0.0%	-13.3%
Barley	0.0%	-0.1%	-0.1%	-4.2%	-45.7%	-45.8%	-44.6%	-40.5%	0.0%	0.0%	-44.6%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B10: Projected Changes in Market Receipts, Costs and Direct Payments in Wales, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Market receipts											
Wheat	0.0%	-0.1%	0.0%	-0.2%	-9.5%	-9.7%	-8.1%	-4.3%	0.0%	0.0%	-7.8%
Barley	0.0%	-0.1%	0.0%	-0.7%	-56.4%	-56.7%	-55.0%	-49.4%	0.0%	-0.1%	-54.7%
Oats	0.0%	0.0%	0.0%	-1.7%	-26.0%	-26.1%	-24.6%	-20.4%	0.0%	0.0%	-24.4%
Total Crops	0.0%	-0.1%	0.0%	-0.3%	-15.2%	-15.3%	-13.8%	-9.8%	0.0%	0.0%	-13.5%
									0.0%	0.0%	0.0%
Cattle	0.0%	2.5%	5.1%	0.7%	1.1%	1.0%	1.0%	1.0%	-2.7%	-1.5%	-0.9%
Pig	0.0%	0.2%	0.3%	0.5%	0.7%	0.7%	0.7%	0.6%	-0.3%	-0.2%	0.6%
Sheep	0.1%	1.7%	2.2%	0.6%	0.9%	0.8%	0.8%	0.8%	-0.8%	-0.7%	1.9%
Poultry	0.0%	0.6%	0.9%	2.6%	3.9%	3.8%	3.7%	3.6%	-0.8%	-0.6%	3.5%
Total Livestock	0.0%	1.9%	3.3%	0.8%	1.3%	1.2%	1.2%	1.2%	-1.6%	-1.0%	0.8%
Milk	0.0%	-0.3%	-0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	-0.2%
Total Market Receipts	0.0%	1.1%	2.0%	0.6%	0.5%	0.5%	0.5%	0.6%	-1.1%	-0.7%	0.2%
Costs											
Feedstuffs	0.0%	-0.4%	-0.3%	3.2%	4.6%	4.4%	4.4%	4.2%	0.3%	0.2%	4.7%
Seeds & loses	0.0%	0.0%	0.0%	4.0%	-13.2%	-14.4%	-12.9%	-9.1%	-0.1%	-0.1%	-12.6%
Payments											
Direct Payments	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Market Receipts + Payments-costs	0.2%	1.2%	2.0%	0.0%	-0.2%	-0.2%	-0.2%	-0.1%	-1.1%	-0.7%	-0.4%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Tables B11 to B14 – Projected changes in Scotland

Table B11: Projected Changes in the Livestock Sectors in Scotland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Cattle											
Beef cows	0.1%	-4.0%	-3.1%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.4%	-0.1%	-1.6%
Dairy cows	0.0%	-1.7%	-1.7%	-0.3%	-0.4%	-0.4%	-0.4%	-0.3%	-0.1%	-0.1%	-2.1%
Total Cattle	0.1%	-3.5%	-3.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.2%	0.2%	-1.4%
Production	0.1%	-3.9%	-4.0%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	1.3%	0.9%	-0.6%
Sheep											
Ewes	0.1%	0.2%	0.4%	0.3%	0.4%	0.4%	0.4%	0.4%	-0.7%	-0.6%	0.0%
Total Sheep	0.1%	0.1%	0.4%	0.3%	0.4%	0.4%	0.4%	0.4%	-0.7%	-0.6%	0.0%
Production	0.0%	-0.4%	0.1%	0.3%	0.4%	0.4%	0.4%	0.4%	-0.5%	-0.5%	-0.1%
Pig											
Sows	0.0%	0.4%	0.6%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.6%	-0.4%	-0.5%
Total pigs	0.0%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.6%	-0.5%	-0.4%
Production	0.0%	0.3%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.4%	-0.3%	-0.3%
Poultry											
Poultry production	0.0%	0.2%	0.4%	1.3%	2.0%	2.0%	1.9%	1.9%	-0.4%	-0.3%	1.8%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B12: Projected Changes in the Dairy Sector in Scotland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Milk											
Milk production	0.0%	-1.7%	-1.7%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	-0.1%	-0.1%	-2.1%
Dairy cows	0.0%	-1.7%	-1.7%	-0.3%	-0.4%	-0.4%	-0.4%	-0.3%	-0.1%	-0.1%	-2.1%
Milk yield per cow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milk price	0.0%	0.0%	0.0%	0.3%	0.5%	0.5%	0.5%	0.5%	0.0%	0.0%	0.5%
Liquid consumption	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.1%
Manufacturing use	0.1%	-3.5%	-3.5%	-0.6%	-0.8%	-0.7%	-0.7%	-0.7%	-0.3%	-0.3%	-4.3%
Production											
Cheese	0.1%	-3.5%	-3.5%	-0.5%	-0.6%	-0.6%	-0.6%	-0.6%	-0.3%	-0.3%	-4.2%
Butter	0.0%	0.6%	0.6%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	0.5%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B13: Projected Changes in the Crop Sector in Scotland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Area											
Wheat	0.0%	-0.2%	-0.2%	-4.5%	-5.6%	-5.4%	-5.1%	-1.9%	0.0%	0.0%	-5.3%
Barley	0.0%	-1.0%	-1.1%	-4.6%	-16.7%	-11.6%	-9.1%	-4.5%	0.1%	0.1%	-9.7%
Rapeseed	0.0%	-0.5%	-0.5%	-4.4%	-4.0%	-4.3%	-4.5%	-4.9%	-0.1%	-0.1%	-5.0%
Oats	0.0%	-0.3%	-0.3%	-4.7%	-11.3%	-8.5%	-6.0%	-4.4%	0.0%	0.0%	-6.3%
Total	0.0%	-0.8%	-0.8%	-4.6%	-13.3%	-9.6%	-7.8%	-4.0%	0.1%	0.0%	-8.3%
Yield											
Wheat	0.0%	0.0%	0.0%	0.5%	0.6%	0.6%	0.6%	0.3%	0.0%	0.0%	0.6%
Barley	0.0%	0.1%	0.1%	0.4%	1.2%	0.9%	0.8%	0.6%	0.0%	0.0%	0.9%
Rapeseed	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%	0.2%	0.0%	0.0%	0.2%
Oats	0.0%	0.0%	0.0%	0.4%	0.9%	0.8%	0.6%	0.5%	0.0%	0.0%	0.7%
Production											
Wheat	0.0%	-0.2%	-0.2%	-4.1%	-5.1%	-4.9%	-4.6%	-1.5%	0.0%	0.0%	-4.7%
Barley	0.0%	-1.0%	-1.1%	-4.2%	-15.7%	-10.7%	-8.4%	-4.0%	0.1%	0.1%	-8.9%
Rapeseed	0.0%	-0.5%	-0.5%	-4.2%	-3.8%	-4.1%	-4.3%	-4.7%	-0.1%	-0.1%	-4.8%
Oats	0.0%	-0.3%	-0.3%	-4.3%	-10.4%	-7.8%	-5.4%	-3.9%	0.0%	0.0%	-5.7%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B14: Projected Changes in Market Receipts, Costs and Direct Payments in Scotland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Market receipts											
Wheat	0.0%	-0.2%	-0.1%	-0.4%	-0.3%	-0.3%	-0.1%	2.6%	0.0%	0.0%	0.2%
Barley	0.0%	-1.0%	-1.0%	-0.5%	-9.6%	-4.4%	-2.0%	2.4%	0.1%	0.0%	-2.2%
Oats	0.0%	-0.2%	-0.2%	-1.3%	-4.4%	-2.4%	-0.4%	0.6%	0.0%	0.0%	-0.4%
Rapeseed	0.0%	-0.1%	-0.1%	-0.7%	-0.9%	-1.0%	-1.0%	-1.1%	0.0%	0.0%	-1.1%
Total Crops	0.0%	-0.7%	-0.7%	-0.5%	-6.6%	-3.1%	-1.4%	2.1%	0.1%	0.0%	-1.5%
									0.0%	0.0%	0.0%
Cattle	0.0%	-0.6%	1.5%	0.6%	1.0%	1.0%	1.0%	0.9%	-3.5%	-2.5%	-2.7%
Pig	0.0%	0.7%	1.1%	1.5%	2.3%	2.3%	2.2%	2.2%	-1.0%	-0.7%	1.8%
Sheep	0.1%	0.7%	1.2%	0.8%	1.2%	1.1%	1.1%	1.1%	-0.8%	-0.7%	1.3%
Poultry	0.0%	0.6%	0.9%	2.7%	4.0%	3.9%	3.8%	3.7%	-0.8%	-0.6%	3.6%
Total Livestock	0.0%	-0.1%	1.4%	0.9%	1.4%	1.4%	1.4%	1.3%	-2.5%	-1.8%	-0.9%
Milk	0.0%	-1.7%	-1.7%	0.0%	0.1%	0.1%	0.1%	0.1%	-0.1%	-0.1%	-1.6%
Total Market Receipts	0.0%	-0.6%	0.2%	0.4%	-0.9%	-0.1%	0.4%	1.3%	-1.4%	-1.0%	-1.2%
Costs											
Feedstuffs	0.0%	-1.4%	-1.3%	3.5%	5.1%	4.9%	4.8%	4.6%	0.1%	0.0%	4.3%
Seeds & loses	0.0%	-0.5%	-0.5%	3.0%	3.2%	4.2%	4.5%	5.5%	0.0%	0.0%	4.7%
Payments											
Direct Payments	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Market Receipts + Payments-costs	0.3%	-0.2%	0.6%	-0.6%	-2.4%	-1.4%	-1.0%	0.0%	-1.4%	-1.0%	-2.2%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Tables B15 to B18 – Projected changes in Northern Ireland

Table B15: Projected Changes in the Livestock Sectors in Northern Ireland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Cattle											
Beef cows	0.1%	-1.5%	-0.7%	0.1%	0.2%	0.2%	0.2%	0.2%	2.1%	2.3%	0.5%
Dairy cows	0.0%	-0.5%	-0.5%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.7%
Total Cattle	0.1%	-1.1%	-0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.3%	0.1%
Production	0.1%	-1.4%	-1.4%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	1.8%	1.5%	0.3%
Sheep											
Ewes	0.1%	-0.4%	-0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.6%	-0.5%	-0.8%
Total Sheep	0.1%	-0.5%	-0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.5%	-0.5%	-0.8%
Production	0.0%	-0.8%	-0.5%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.4%	-0.4%	-0.8%
Pig											
Sows	0.0%	0.2%	0.4%	0.0%	-0.1%	0.0%	0.0%	0.0%	-0.4%	-0.2%	-0.3%
Total pigs	0.0%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.4%	-0.3%	-0.3%
Production	0.0%	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	-0.2%
Poultry											
Poultry production	0.0%	0.1%	0.2%	0.7%	1.0%	1.0%	1.0%	1.0%	-0.2%	-0.1%	1.0%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B16: Projected Changes in the Dairy Sector in Northern Ireland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Milk											
Milk production	0.0%	-0.5%	-0.5%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.7%
Dairy cows	0.0%	-0.5%	-0.5%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.7%
Milk yield per cow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milk price	0.0%	0.0%	0.0%	0.3%	0.5%	0.5%	0.5%	0.4%	0.0%	0.0%	0.5%
Liquid consumption	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Manufacturing use	0.0%	-0.5%	-0.6%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.1%	-0.1%	-0.9%
Production											
Cheese	0.0%	-0.3%	-0.3%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.4%
Butter	0.0%	-0.5%	-0.5%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	-0.1%	-0.1%	-0.9%
SMP	0.0%	-0.9%	-0.9%	-0.5%	-0.8%	-0.8%	-0.8%	-0.7%	-0.1%	-0.1%	-1.8%
WMP	0.0%	-0.9%	-0.9%	0.0%	0.1%	0.1%	0.1%	0.1%	-0.1%	-0.1%	-0.8%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B17: Projected Changes in the Crop Sector in Northern Ireland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Area											
Wheat	0.0%	-0.2%	-0.2%	-3.4%	-16.7%	-13.7%	-11.8%	-0.6%	-0.1%	-0.1%	-12.1%
Barley	0.0%	-0.2%	-0.2%	-3.4%	-32.5%	-27.1%	-25.9%	-10.2%	-0.1%	-0.1%	-26.1%
Rapeseed	0.0%	-0.1%	0.0%	-4.3%	-6.7%	-6.9%	-6.1%	-7.0%	0.0%	0.0%	-6.1%
Total	0.0%	-0.2%	-0.2%	-3.4%	-28.0%	-23.4%	-22.0%	-7.7%	-0.1%	-0.1%	-22.2%
Yield											
Wheat	0.0%	0.0%	0.0%	0.4%	1.2%	1.0%	0.9%	0.2%	0.0%	0.0%	0.9%
Barley	0.0%	0.0%	0.0%	0.3%	1.5%	1.3%	1.3%	0.7%	0.0%	0.0%	1.3%
Rapeseed	0.0%	0.0%	0.0%	0.4%	0.5%	0.5%	0.4%	0.5%	0.0%	0.0%	0.4%
Production											
Wheat	0.0%	-0.2%	-0.2%	-3.1%	-15.7%	-12.8%	-11.0%	-0.4%	-0.1%	-0.1%	-11.3%
Barley	0.0%	-0.2%	-0.2%	-3.1%	-31.5%	-26.2%	-25.0%	-9.6%	-0.1%	-0.1%	-25.2%
Rapeseed	0.0%	-0.1%	-0.1%	-4.0%	-6.3%	-6.5%	-5.7%	-6.5%	0.0%	0.0%	-5.7%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B18: Projected Changes in Market Receipts, Costs and Direct Payments in Northern Ireland, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Market receipts											
Wheat	0.0%	-0.2%	-0.2%	0.6%	-11.6%	-8.7%	-6.9%	4.1%	-0.1%	-0.1%	-6.7%
Barley	0.0%	-0.2%	-0.2%	0.6%	-26.4%	-20.9%	-19.8%	-3.6%	-0.1%	-0.1%	-19.6%
Oats	0.0%	-0.2%	-0.1%	-0.3%	-20.4%	-16.3%	-15.1%	-2.3%	-0.1%	-0.1%	-15.0%
Rapeseed	0.0%	-0.2%	-0.1%	-2.7%	-6.1%	-6.3%	-5.5%	-6.5%	0.0%	0.0%	-5.4%
Total Crops	0.0%	-0.2%	-0.2%	0.5%	-20.9%	-16.5%	-15.1%	-1.1%	-0.1%	-0.1%	-14.9%
									0.0%	0.0%	0.0%
Cattle	0.0%	2.0%	4.5%	0.7%	1.2%	1.1%	1.1%	1.1%	-3.4%	-2.1%	-1.9%
Pig	0.0%	0.5%	0.8%	1.4%	2.1%	2.1%	2.0%	2.0%	-0.8%	-0.5%	1.7%
Sheep	0.1%	0.3%	0.7%	0.6%	0.9%	0.9%	0.8%	0.8%	-0.7%	-0.6%	0.5%
Poultry	0.0%	0.5%	0.8%	2.3%	3.5%	3.4%	3.3%	3.2%	-0.8%	-0.5%	3.1%
Total Livestock	0.0%	1.3%	2.7%	1.2%	1.8%	1.8%	1.8%	1.7%	-2.1%	-1.3%	0.0%
Milk	0.0%	-0.5%	-0.5%	0.1%	0.2%	0.2%	0.2%	0.2%	-0.1%	-0.1%	-0.2%
Total Market Receipts	0.0%	0.6%	1.4%	0.8%	0.7%	0.7%	0.7%	1.1%	-1.3%	-0.8%	-0.5%
Costs											
Total Costs	0.0%	-0.5%	-0.2%	1.0%	1.0%	1.1%	1.1%	1.3%	0.5%	0.6%	1.1%
Payments											
Direct Payments	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Market Receipts + Payments-costs	0.2%	1.2%	2.3%	0.4%	0.2%	0.3%	0.3%	0.6%	-2.3%	-1.7%	-1.2%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Tables B19 to B22 – Projected changes in UK

Table B19: Projected Changes in the Livestock Sectors in the UK, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Cattle											
Beef cows	0.1%	-0.9%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	-0.1%	0.2%	-0.5%
Dairy cows	0.0%	-0.3%	-0.3%	-0.3%	-0.4%	-0.4%	-0.4%	-0.3%	0.0%	0.0%	-0.7%
Total Cattle	0.1%	-0.8%	-0.4%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	0.3%	0.3%	-0.4%
Beef											
Production	0.1%	-1.3%	-1.3%	-0.2%	-0.3%	-0.2%	-0.2%	-0.2%	1.1%	0.8%	0.1%
Domestic use	0.0%	-0.8%	-1.4%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	1.2%	0.9%	0.7%
Cattle price	-0.1%	3.4%	5.9%	0.8%	1.3%	1.2%	1.2%	1.2%	-5.0%	-3.5%	-2.2%
Sheep											
Ewes	0.1%	0.7%	0.9%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.5%	-0.4%	0.4%
Total Sheep	0.1%	0.7%	0.9%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.4%	-0.4%	0.4%
Sheepmeat											
Production	0.0%	0.3%	0.7%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.3%	-0.3%	0.4%
Domestic use	0.0%	-0.2%	-0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	-0.1%	-0.1%	-0.1%
Sheepmeat price	0.0%	1.1%	1.2%	0.5%	0.8%	0.7%	0.7%	0.7%	-0.4%	-0.2%	1.3%
Pig											
Sows	0.0%	0.3%	0.4%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	-0.4%	-0.3%	-0.3%
Total pigs	0.0%	0.3%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.4%	-0.3%	-0.3%
Pork											
Production	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	-0.2%
Domestic use	0.0%	0.1%	0.1%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.0%	0.0%	-0.3%
Pigmeat reference price	0.0%	0.4%	0.5%	1.5%	2.3%	2.2%	2.2%	2.1%	-0.6%	-0.4%	2.0%
Poultry											
Production	0.0%	0.2%	0.3%	0.9%	1.3%	1.3%	1.3%	1.2%	-0.2%	-0.2%	1.2%
Domestic use	0.0%	0.1%	0.1%	-0.4%	-0.6%	-0.6%	-0.6%	-0.6%	-0.1%	0.0%	-0.7%
Chicken price	0.0%	0.4%	0.6%	1.6%	2.4%	2.4%	2.3%	2.2%	-0.6%	-0.4%	2.1%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B20: Projected Changes in the Dairy Sector in the UK, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Dairy											
Cow's milk Production	0.0%	-0.3%	-0.3%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	0.0%	0.0%	-0.7%
Liquid consumption	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.1%
Manufacturing use	0.1%	-0.6%	-0.6%	-0.6%	-0.8%	-0.8%	-0.8%	-0.8%	0.0%	-0.1%	-1.4%
Prices											
Producer milk price	0.0%	0.0%	0.0%	0.3%	0.5%	0.5%	0.5%	0.4%	0.0%	0.0%	0.5%
Cheese price	0.0%	0.0%	0.0%	0.7%	1.0%	1.0%	1.0%	0.9%	0.0%	0.0%	1.1%
Butter price	0.0%	0.0%	0.0%	0.3%	0.5%	0.5%	0.5%	0.5%	0.0%	0.0%	0.5%
WMP price	0.0%	0.0%	0.0%	0.7%	1.2%	1.1%	1.1%	1.1%	0.0%	0.0%	1.2%
SMP price	0.0%	0.0%	0.0%	0.8%	1.1%	1.1%	1.1%	1.0%	0.0%	0.0%	1.2%
Cheese											
Production	0.0%	-0.7%	-0.7%	-0.2%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.9%
Domestic use	0.0%	0.0%	0.0%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%	0.0%	0.0%	-0.2%
Butter											
Production	0.0%	-0.1%	-0.1%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.0%	0.0%	-0.4%
Domestic use	0.0%	0.0%	0.0%	-0.1%	-0.2%	-0.2%	-0.1%	-0.1%	0.0%	0.0%	-0.2%
SMP											
Production	0.1%	-0.9%	-0.9%	-1.0%	-1.3%	-1.2%	-1.2%	-1.2%	-0.1%	-0.1%	-2.2%
Domestic use	0.0%	0.0%	0.0%	-0.2%	-0.4%	-0.4%	-0.4%	-0.3%	0.0%	0.0%	-0.4%
WMP											
Production	0.1%	-0.9%	-0.9%	-0.2%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-1.1%
Domestic use	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B21: Projected Changes in the Crop Sector in the UK, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Wheat											
Production	0.0%	0.0%	0.0%	-4.4%	-5.7%	-5.0%	-4.8%	-4.3%	0.0%	0.0%	-4.8%
Domestic use	0.0%	-0.1%	0.0%	-0.4%	-0.3%	-0.3%	-0.3%	-0.3%	0.0%	0.0%	-0.4%
Barley											
Production	0.0%	-0.3%	-0.4%	-4.4%	-13.1%	-10.3%	-9.0%	-5.7%	0.0%	0.0%	-9.2%
Domestic use	0.0%	-0.1%	0.0%	-0.2%	-0.7%	-0.7%	-0.7%	-0.6%	0.0%	0.0%	-0.8%
Rapeseed											
Production	0.0%	-0.1%	-0.1%	-3.4%	-4.5%	-5.3%	-5.0%	-4.1%	0.0%	0.0%	-5.8%
Domestic use	0.0%	0.0%	0.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Area											
Total	0.0%	-0.1%	-0.1%	-4.6%	-8.1%	-7.1%	-6.6%	-5.1%	0.0%	0.0%	-6.8%
Wheat	0.0%	0.0%	0.0%	-4.9%	-6.3%	-5.6%	-5.4%	-4.8%	0.0%	0.0%	-5.4%
Barley	0.0%	-0.3%	-0.4%	-4.8%	-13.9%	-11.0%	-9.7%	-6.3%	0.0%	0.0%	-9.9%
Rapeseed	0.0%	-0.1%	-0.1%	-3.7%	-4.8%	-5.6%	-5.3%	-4.4%	0.0%	0.0%	-6.1%
Prices											
Wheat	0.0%	0.0%	0.0%	3.8%	4.9%	4.8%	4.7%	4.5%	0.0%	0.0%	5.1%
Barley	0.0%	0.0%	0.0%	3.9%	7.4%	7.1%	7.0%	6.7%	0.0%	0.0%	7.5%
Rapeseed	0.0%	-0.1%	-0.1%	1.3%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.3%
Oat	0.0%	0.0%	0.0%	2.9%	5.4%	5.2%	5.1%	4.9%	0.0%	0.0%	5.5%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Table B22: Projected Changes in the Market Receipts, Costs and Direct Payments in the UK, percentage difference in 2021 compared to the Baseline

	S(i)	S(ii)		S(iii)					S(iv)		S(v)
		a	b	a	b (1)	b (2)	b (3)	b(4)	a	b	(3)
Market receipts											
Wheat	0.0%	0.0%	0.0%	-0.9%	-1.2%	-0.5%	-0.4%	0.1%	0.0%	0.0%	0.1%
Barley	0.0%	-0.4%	-0.4%	-0.8%	-7.3%	-3.8%	-2.3%	1.6%	0.0%	0.0%	-2.1%
Oats	0.0%	0.0%	0.0%	-2.0%	-2.8%	-1.7%	-1.1%	-0.1%	0.0%	0.0%	-0.8%
Rapeseed	0.0%	-0.1%	-0.1%	-2.0%	-4.1%	-4.9%	-4.6%	-3.8%	0.0%	0.0%	-5.2%
Sugar	0.0%	-0.1%	-0.2%	0.4%	0.6%	0.6%	0.6%	0.5%	0.0%	0.0%	-21.5%
Total Crops	0.0%	-0.1%	-0.1%	-1.1%	-3.1%	-2.3%	-1.8%	-0.6%	0.0%	0.0%	-3.0%
Cattle	0.0%	2.0%	4.5%	0.6%	1.0%	1.0%	1.0%	0.9%	-3.9%	-2.7%	-2.1%
Pig	0.0%	0.6%	0.9%	1.5%	2.2%	2.2%	2.1%	2.1%	-0.8%	-0.6%	1.8%
Sheep	0.1%	1.4%	1.9%	0.6%	0.9%	0.8%	0.8%	0.8%	-0.6%	-0.5%	1.8%
Poultry	0.0%	0.6%	0.9%	2.5%	3.8%	3.6%	3.6%	3.5%	-0.8%	-0.6%	3.4%
Total Livestock	0.0%	1.3%	2.5%	1.2%	1.9%	1.9%	1.8%	1.8%	-2.0%	-1.4%	0.6%
Milk	0.0%	-0.2%	-0.2%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	-0.2%
Total Market Receipts	0.0%	0.5%	1.1%	0.3%	0.1%	0.3%	0.4%	0.7%	-1.0%	-0.7%	-0.2%
Costs											
Feedstuffs	0.0%	-0.2%	-0.1%	3.4%	5.0%	4.8%	4.7%	4.5%	-0.1%	-0.1%	4.9%
Seeds & loses	0.0%	-0.1%	0.0%	2.7%	3.1%	3.0%	3.0%	2.8%	0.0%	0.0%	3.3%
Payments											
Direct Payments	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Market Receipts + Payments - Costs	0.2%	0.6%	1.2%	-0.6%	-1.2%	-1.0%	-0.8%	-0.5%	-1.1%	-0.7%	-1.4%

S(i): Redistribution of direct payments between Member States
S(ii)a: Flat rate payment (transition 2014 to 2019)
S(ii)b: Flat rate payment (transition 2014 to 2016)
S(iii)a: Ecological focus areas
S(iii)b: Combined greening measures [sub-scenarios 1, 2, 3 & 4 refer to different decision rules for crop diversification (see methodology)]
S(iv)a: Coupled payment with no quantitative limit
S(iv)b: Coupled payment with quantitative limit
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]

Appendix C: Summary tables of Scenario v(1) to v(4)

The combined scenario in the main report presented results using the crop diversification rules employed under Scenario (iii)b3. The tables below present results using alternative crop diversification decision rules:

S(v)1: Combined reforms [combines Scenarios (i), (ii)b, (iii)b1 and (iv)b]
S(v)2: Combined reforms [combines Scenarios (i), (ii)b, (iii)b2 and (iv)b]
S(v)3: Combined reforms [combines Scenarios (i), (ii)b, (iii)b3 and (iv)b]
S(v)4: Combined reforms [combines Scenarios (i), (ii)b, (iii)b4 and (iv)b]

Table C1: Projected Changes in the Livestock Sectors in the UK under Scenario v(1) to v(4) compared to the Baseline in 2021

	S(V)			
	(1)	(2)	(3)	(4)
Cattle				
Beef cows	-0.5%	-0.5%	-0.5%	-0.5%
Dairy cows	-0.7%	-0.7%	-0.7%	-0.7%
Total Cattle	-0.4%	-0.4%	-0.4%	-0.4%
Beef				
Production	0.1%	0.1%	0.1%	0.1%
Domestic use	0.7%	0.7%	0.7%	0.8%
Cattle price	-2.1%	-2.2%	-2.2%	-2.2%
Sheep				
Ewes	0.4%	0.4%	0.4%	0.4%
Total Sheep	0.4%	0.4%	0.4%	0.4%
Sheepmeat				
Production	0.4%	0.4%	0.4%	0.4%
Domestic use	-0.1%	-0.1%	-0.1%	-0.1%
Sheepmeat price	1.4%	1.4%	1.3%	1.3%
Pig				
Sows	-0.3%	-0.3%	-0.3%	-0.3%
Total pigs	-0.3%	-0.3%	-0.3%	-0.3%
Pork				
Production	-0.2%	-0.2%	-0.2%	-0.2%
Domestic use	-0.3%	-0.3%	-0.3%	-0.3%
Pigmeat reference price	2.1%	2.1%	2.0%	2.0%
Poultry				
Production	1.3%	1.2%	1.2%	1.2%
Domestic use	-0.7%	-0.7%	-0.7%	-0.7%
Chicken price	2.2%	2.2%	2.1%	2.1%

Table C2: Projected Changes in the Dairy Sector in the UK under Scenario v(1) to v(4) compared to the Baseline in 2021

	S(V)			
	(1)	(2)	(3)	(4)
Dairy				
Cow's milk Production	-0.7%	-0.7%	-0.7%	-0.6%
Liquid consumption	-0.1%	-0.1%	-0.1%	-0.1%
Manufacturing use	-1.4%	-1.4%	-1.4%	-1.4%
Prices				
Producer milk price	0.5%	0.5%	0.5%	0.5%
Cheese price	1.1%	1.1%	1.1%	1.0%
Butter price	0.6%	0.5%	0.5%	0.5%
WMP price	1.2%	1.2%	1.2%	1.1%
SMP price	1.2%	1.2%	1.2%	1.1%
Cheese				
Production	-0.9%	-0.9%	-0.9%	-0.9%
Domestic use	-0.2%	-0.2%	-0.2%	-0.2%
Butter				
Production	-0.4%	-0.4%	-0.4%	-0.4%
Domestic use	-0.2%	-0.2%	-0.2%	-0.2%
SMP				
Production	-2.3%	-2.2%	-2.2%	-2.2%
Domestic use	-0.4%	-0.4%	-0.4%	-0.4%
WMP				
Production	-1.1%	-1.1%	-1.1%	-1.0%
Domestic use	0.0%	0.0%	0.0%	0.0%

Table C3: Projected Changes in the Crop Sector in the UK under Scenario v(1) to v(4) compared to the Baseline in 2021

	S(V)			
	(1)	(2)	(3)	(4)
Wheat				
Production	-5.7%	-5.0%	-4.8%	-4.3%
Domestic use	-0.4%	-0.4%	-0.4%	-0.4%
Barley				
Production	-13.3%	-10.5%	-9.2%	-5.8%
Domestic use	-0.9%	-0.8%	-0.8%	-0.8%
Rapeseed				
Production	-5.3%	-6.1%	-5.8%	-4.9%
Domestic use	0.0%	0.0%	0.0%	0.0%
Area				
Total	-8.3%	-7.3%	-6.8%	-5.4%
Wheat	-6.3%	-5.6%	-5.4%	-4.8%
Barley	-14.1%	-11.2%	-9.9%	-6.5%
Rapeseed	-5.6%	-6.4%	-6.1%	-5.2%
Prices				
Wheat	5.4%	5.2%	5.1%	5.0%
Barley	7.8%	7.6%	7.5%	7.1%
Rapeseed	0.3%	0.3%	0.3%	0.2%
Oat	5.8%	5.6%	5.5%	5.2%

Table C4: Projected Changes in Market Receipts, Costs and Direct Payments in the UK under Scenario v(1) to v(4) compared to the Baseline in 2021

	S(V)			
	(1)	(2)	(3)	(4)
Market receipts				
Wheat	-0.7%	-0.1%	0.1%	0.6%
Barley	-7.1%	-3.6%	-2.1%	1.8%
Oats	-2.5%	-1.4%	-0.8%	0.2%
Rapeseed	-4.7%	-5.5%	-5.2%	-4.4%
Sugar	-21.5%	-21.5%	-21.5%	-21.5%
Total Crops	-4.3%	-3.5%	-3.0%	-1.8%
Cattle	-2.1%	-2.1%	-2.1%	-2.2%
Pig	1.9%	1.8%	1.8%	1.7%
Sheep	1.8%	1.8%	1.8%	1.7%
Poultry	3.5%	3.4%	3.4%	3.2%
Total Livestock	0.7%	0.6%	0.6%	0.5%
Milk	-0.2%	-0.2%	-0.2%	-0.2%
Total Market Receipts	-0.5%	-0.3%	-0.2%	0.1%
Costs				
Feedstuffs	5.1%	5.0%	4.9%	4.7%
Seeds & loses	3.4%	3.3%	3.3%	3.1%
Payments				
Direct Payments	1.1%	1.1%	1.1%	1.1%
Market Receipts + Payments - Costs	-1.7%	-1.5%	-1.4%	-1.0%

Appendix D: Sensitivity Analysis

Tables D1 to D4 – Projected percentage differences between Scenario (v)3 and the Baseline in 2021 under different production stimulating assumptions: 10%, 30% and 50%. (30% production stimulating assumption used within main analysis discussed in the report).

The sensitivity analysis assesses the importance of the assumption regarding the production stimulating impact of the decoupled direct payments. As noted in Section 2, it is assumed within the main analysis that the decoupled direct payments have a 30 per cent production stimulating impact compared to the old coupled payments. The Baseline and Scenario (v) are re-simulated with lower (10%) and higher (50%) production stimulating assumptions. UK comparisons between the alternative Scenarios and Baselines are shown in Tables D1 to D4.

In general, the projected differences can primarily be attributed to the reintroduction of coupled payments. The projected expansion in suckler cows in countries that opted to reintroduce coupled beef payments are larger under the 10% assumption sensitivity analysis compared to the main analysis. For example, under the 10% Scenario (v) it is projected that suckler cow numbers in Wales and Northern Ireland expand by 3.2 and 2.2 per cent respectively relative to the 10% Baseline, compared to 2.6 and 0.5 per cent in the main analysis. This reflects the fact that there is a greater differential in the production impact of the decoupled payment and coupled payment under the 10% sensitivity analysis. Similarly, the projected increase in EU-27 suckler cow numbers is larger under the 10% sensitivity analysis compared to the main analysis and consequently the beef price falls to a greater extent.

In contrast, when it is assumed that the decoupled payments have a 50% production stimulating impact the projected expansion in suckler cow numbers in countries that opt to reintroduce coupled beef payments is less marked. Under the 50% assumption, the differential in the production impact of the decoupled and coupled payments is less significant. For example, it is projected that Welsh beef cow numbers increase by just 2.0 per cent and projected Northern Irish beef cows actually decrease by -0.8 per cent. The overall increase in EU beef production is less marked and there is a commensurate fall in the beef price.

Table D1: Projected Changes in the Livestock Sectors in the UK under Scenario (v)3 compared to the Baseline in 2021

	10% Production Simulating Impact	30% Production Simulating Impact	50% Production Simulating Impact
Cattle			
Beef cows	-0.4%	-0.5%	-0.6%
Dairy cows	-0.5%	-0.7%	-0.9%
Total Cattle	-0.2%	-0.4%	-0.6%
Beef			
Production	0.5%	0.1%	-0.3%
Domestic use	1.1%	0.7%	0.5%
Cattle price	-3.6%	-2.2%	-1.0%
Sheep			
Ewes	0.6%	0.4%	0.2%
Total Sheep	0.6%	0.4%	0.2%
Sheepmeat			
Production	0.6%	0.4%	0.1%
Domestic use	-0.1%	-0.1%	-0.1%
Sheepmeat price	1.2%	1.3%	1.4%
Pig			
Sows	-0.4%	-0.3%	-0.2%
Total pigs	-0.4%	-0.3%	-0.2%
Pork			
Production	-0.3%	-0.2%	-0.1%
Domestic use	-0.3%	-0.3%	-0.3%
Pigmeat reference price	2.0%	2.0%	2.1%
Poultry			
Production	1.1%	1.2%	1.3%
Domestic use	-0.7%	-0.7%	-0.7%
Chicken price	2.0%	2.1%	2.2%

Table D2: Projected Changes in the Dairy Sector in the UK under Scenario (v)3 compared to the Baseline in 2021

	10% Production Simulating Impact	30% Production Simulating Impact	50% Production Simulating Impact
Dairy			
Cow's milk Production	-0.5%	-0.7%	-0.8%
Liquid consumption	-0.1%	-0.1%	-0.1%
Manufacturing use	-1.0%	-1.4%	-1.8%
Prices			
Producer milk price	0.5%	0.5%	0.5%
Cheese price	1.0%	1.1%	1.1%
Butter price	0.5%	0.5%	0.5%
WMP price	1.2%	1.2%	1.2%
SMP price	1.2%	1.2%	1.2%
Cheese			
Production	-0.4%	-0.9%	-1.3%
Domestic use	-0.2%	-0.2%	-0.2%
Butter			
Production	-0.3%	-0.4%	-0.5%
Domestic use	-0.2%	-0.2%	-0.2%
SMP			
Production	-1.6%	-2.2%	-2.8%
Domestic use	-0.4%	-0.4%	-0.4%
WMP			
Production	-0.4%	-1.1%	-1.7%
Domestic use	0.0%	0.0%	0.0%

Table D3: Projected Changes in the Crop Sector in the UK under Scenario (v)3 compared to the Baseline in 2021

	10% Production Simulating Impact	30% Production Simulating Impact	50% Production Simulating Impact
Wheat			
Production	-4.9%	-4.8%	-4.8%
Domestic use	-0.4%	-0.4%	-0.5%
Barley			
Production	-9.0%	-9.2%	-9.4%
Domestic use	-0.8%	-0.8%	-0.9%
Rapeseed			
Production	-5.7%	-5.8%	-5.8%
Domestic use	-0.1%	0.0%	0.0%
Area			
Total	-6.8%	-6.8%	-6.9%
Wheat	-5.4%	-5.4%	-5.4%
Barley	-9.8%	-9.9%	-10.1%
Rapeseed	-6.1%	-6.1%	-6.1%
Prices			
Wheat	5.2%	5.1%	5.1%
Barley	7.5%	7.5%	7.4%
Rapeseed	0.3%	0.3%	0.2%
Oat	5.5%	5.5%	5.5%

Table D4: Projected Changes in Market Receipts, Costs and Direct Payments in the UK under Scenario (v) compared to the Baseline in 2021

	10% Production Simulating Impact	30% Production Simulating Impact	50% Production Simulating Impact
Market receipts			
Wheat	0.1%	0.1%	0.1%
Barley	-1.9%	-2.1%	-2.3%
Oats	-0.8%	-0.8%	-0.8%
Rapeseed	-5.1%	-5.2%	-5.3%
Sugar	-21.4%	-21.5%	-21.6%
Total Crops	-3.0%	-3.0%	-3.1%
	0.0%	0.0%	0.0%
Cattle	-3.2%	-2.1%	-1.3%
Pig	1.6%	1.8%	1.9%
Sheep	1.8%	1.8%	1.5%
Poultry	3.1%	3.4%	3.5%
Total Livestock	0.1%	0.6%	1.0%
Milk	0.0%	-0.2%	-0.3%
Total Market Receipts	-0.4%	-0.2%	-0.1%
Costs			
Feedstuffs	5.0%	4.9%	4.7%
Seeds & loses	3.3%	3.3%	3.2%
Payments			
Direct Payments	1.1%	1.1%	1.1%
Market Receipts + Payments - Costs	-1.6%	-1.4%	-1.2%