

The Impact of Trade Liberalisation on Agriculture in Scotland



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Executive Summary

This paper presents the results of three trade liberalisation analyses based on the FAPRI-UK modelling system of the Scottish dairy, beef, sheep and arable sectors relative to a baseline, which incorporates the 2003 Fischler CAP Reforms.

Export Subsidy Elimination

- The widespread use of export subsidies within the dairy sector means that the elimination of these subsidies has a particularly severe impact on dairy commodity prices. The price effect is particularly pronounced for butter. As a result, the Scottish milk producer price is significantly lower under the export subsidy elimination scenario compared to the Baseline. The lower milk price has a negative impact on production in Scotland as the UK quota is not fully utilised.
- In the beef sector, the reliance on export subsidies means their elimination leads to lower prices throughout the EU, including Scotland, relative to the Baseline. Beef that previously would have been exported with subsidy support remains in the EU market. Given the fall in projected beef prices, there is a considerable decline in animal numbers and production levels.
- Elimination of export subsidies also leads to a decline, relative to the Baseline, in projected Scottish sheepmeat prices and production. However, the decline is much less marked than in the beef sector, since the sheep sector is not reliant on export subsidies. The fall in projected sheep prices is entirely due to cross-price effects. The fall in other meat prices reduces the demand for sheepmeat, which exerts a slight downward impact on sheepmeat prices.
- The elimination of export subsidies has only a slight projected impact on the arable sector, with a marginal decline in projected prices and no change in production, as there is little or no reliance on export subsidies.

Export Subsidy Elimination and Import Tariff Reduction

- In the dairy sector, tariff reductions do not add significantly to the projected price and production impacts of the elimination of export subsidies. The depressing impact of export subsidy elimination on EU prices widens the differential between EU prices and world prices plus the Uruguay Round Agreement Act (URAA) import tariffs and thus enhances the effectiveness of import tariffs in protecting the EU market. Consequently, even when import tariffs are reduced by 60 per cent, they still stem the inflow of imports from third countries into the EU.

- In the beef sector it is projected that reducing import tariffs, in addition to eliminating export subsidies, causes Scottish prices and production to fall further. The impact, however, is limited as the tariffs are still largely effective in preventing third country exporters from flooding the EU market with beef.
- Import tariff reductions, in addition to eliminating export subsidies, however, have a significant impact on the sheep sector. The small projected price impact due to the elimination of export subsidies means that reductions in import tariffs lead to a large increase in imports into the EU from third countries. This causes Scottish sheepmeat prices and hence production to fall.
- In the arable sector, import tariff reductions, in addition to eliminating export subsidies, have little impact on prices and production. It is projected that the reduced tariffs are still effective in stemming the inflow of crop imports.

Export Subsidy Elimination and Import Penetration

- In general, increasing imports of the main agricultural commodities by 10 per cent of their EU domestic consumption has a significant impact on projected prices. Imports generate extra supply. Due to the elimination of export subsidies, the market cannot clear via subsidised exports; hence prices decline to discourage production.
- In the dairy sector, butter and cheese prices decline sharply under this scenario due to imports displacing domestic production. The projected decline in butter and cheese prices has a negative impact on the Scottish milk producer price. There is a corresponding decline in milk production in Scotland. At the UK level, dairy quota is not fully utilised.
- Increased import penetration has a significant effect on prices in the beef, sheep and arable sectors due to imports displacing EU production. The decline in prices in the beef and sheep sectors exerts a downward effect on Scottish production in these sectors although this is offset slightly by the decline in crop prices and hence input costs.

In addition, the results of three supplementary analyses are presented in the appendices: continuation of the Over Thirty Months Scheme (OTMS); sensitivity analysis assuming a euro/US dollar parity exchange rate and export subsidy elimination plus differential tariff reduction (Harbinson).

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The Impact of Trade Liberalisation on Agriculture in Scotland

Introduction

As part of the July 2004 framework of modalities for reducing agricultural protection and support, World Trade Organisation (WTO) member countries, including EU Member States, agreed to eliminate export subsidies and improve market access. The subsequent negotiations on specific details have been the source of much disagreement, particularly with regard to improved market access. The framework outlined some general principles on the nature of improved market access: a tariff cut formula based on different bands, with the highest reduction applying for the highest tariffs; self selection of an appropriate number of products, with a combination of lower tariff cuts and Tariff Rate Quota (TRQ) expansion providing substantial market access for each tariff line; and differential treatment for developing countries. In October 2005 the European Commission offered a fresh proposal on market access with differential cuts in import tariffs of up to 60 per cent for the highest tariff and a reduction in the number of 'sensitive' products.

The following analyses consider a range of scenarios on trade liberalisation to identify the impact of individual policy components on agriculture in Scotland. While the set of scenarios do not explicitly model the European Commission's October 2005 proposals, they provide insight into the consequences of significant cuts in import tariffs. An overview of the methodology underlying the policy analysis is provided in Section 1, while the assumptions relating to the Baseline are described in Section 2. Section 3 describes the various trade liberalisation policy scenarios undertaken in this study. The results are presented for each sector in Section 4 and conclusions are drawn in Section 5.

1. Methodology

The FAPRI-UK modelling system, which is integrated into the FAPRI EU-GOLD model, produces Baseline projections over a ten year period of key variables in the beef, sheep, dairy and cereal sectors for each country in the UK, under the assumption that current policies remain in place and specific macroeconomic assumptions hold. The Baseline does not constitute a forecast, but provides a benchmark against which projections of the policy scenarios can be compared and interpreted. In order to evaluate the impact of trade liberalisation on the agricultural sector in Scotland, the following policy scenarios were simulated within the modelling system:

- I. Export subsidy elimination;
- II. Export subsidy elimination plus reduction in import tariffs; and
- III. Export subsidy elimination plus increased import penetration.

The first scenario simulates the elimination of export subsidies on a stand-alone basis, while the latter two scenarios simulate two different ways of improving market access, in addition to the removal of subsidies.

2. Baseline Assumptions

The following assumptions pertain to the Baseline projection:

- The Baseline incorporates the Fischler CAP Reforms agreed in Luxembourg in 2003. Of particular importance is the replacement of coupled direct payments with the decoupled Single Farm Payment (SFP). It is assumed that the SFP has a production stimulating effect but that this effect declines over time. Specifically, it is assumed that the SFP has an associated production response of 70% in 2005, 50% in 2006 and 30% in 2007 and for the remainder of the projection period.
- Compulsory EU Modulation is applied to all direct payments (including the SFP, but excluding the first €5000 paid to each farmer) at a rate of 3% in 2005, rising to 4% in 2006 and to its maximum of 5% in 2007. Additional modulation at a rate of 3.5% in 2005 and 4.5% in 2006 and for the remainder of the projection period is applied in Scotland. It is assumed that the financial discipline further reduces direct payments by a limited amount (maximum 3.4%) over the projection period (details available from the authors).
- The dairy quota increases agreed under Agenda 2000 are implemented in 2005, 2006 and 2007. Dairy support prices are cut asymmetrically. The intervention price for butter is reduced by 25% from 2004 to 2007, while the intervention price for skimmed milk powder is reduced by 15% from 2004 to 2006. These intervention price cuts supersede those agreed under Agenda 2000.
- The Over Thirty Month Scheme (OTMS) ends at the end of 2005 and beef exports resume in 2006.
- Assumptions are made regarding the behaviour of the European Commission. In particular, it is assumed that the European Commission will not continue to provide export refunds in the dairy sector if market prices exceed their intervention levels

and thus dairy export refunds are reduced so that the commodity prices fall close to their intervention levels.

- The EU export subsidy limits and import tariffs that were agreed under the URAA remain in place.
- The key macro-economic assumptions incorporated in the Baseline are provided by Global Insight and are reproduced in Appendix A.

3. Policy Scenarios Analysed

(i) Export Subsidy Elimination Scenario

The framework of modalities did not include a timetable for phasing out export subsidies. Under the Export Subsidy Elimination (ESE) scenario, the permitted value of export subsidies that was agreed under the URAA is reduced in equal steps over the five-year period 2006 to 2010. Hence, by 2010 all export subsidies are prohibited. This time frame was selected so that the full effects of the elimination could be incorporated over the 10-year span of the projections. (The outcome of the recent WTO negotiations in Hong Kong is a phased reduction in export subsidies with total elimination by 2013). In conjunction with the phased elimination of export subsidies, it is assumed that intervention prices are lowered where necessary to allow the markets to clear, thus avoiding the build up of stocks.

(ii) Export Subsidy Elimination plus Import Tariff Reduction Scenario

This scenario simulates a reduction in EU import tariffs, in conjunction with the elimination of export subsidies. Implementing tariff reductions is not straightforward as commodities are modelled in aggregate terms while in reality there are numerous tariff lines within each commodity type (e.g. different cuts of beef). In the modelling system a single representative tariff is used for each modelled commodity (see authors for details). Under this scenario the tariffs levels agreed under the URAA are reduced in equal yearly increments up to 60 per cent across all agricultural commodities by 2010. The reduction in tariffs is phased in over the same period as the elimination of export subsidies (2006 to 2010).

iii) Export Subsidy Elimination plus Increased Market Penetration Scenario

The increased market penetration scenario is designed to assess the vulnerability of the EU agricultural sector to a significant increase in imports. It is implemented by forcing additional imports onto the EU domestic market in addition to eliminating export subsidies. Specifically, imports are increased by 10 per cent of EU domestic consumption. It should be noted that this is a purely hypothetical scenario that simply indicates the impact on the Scottish agricultural sector of increased import penetration.

The results of three additional analyses are presented in Appendix B, C and D:

- In the Baseline it is assumed that the Over Thirty Months Scheme (OTMS) no longer operates. To determine the impact that the retention of this scheme would have had on the Baseline, it is run with the assumption that the OTMS continued and the beef export ban remained in place throughout the ten-year projection period. The resultant projections are presented in Appendix B
- The euro-dollar exchange rate influences the level of trade between the EU and the rest of the world. The sensitivity of the projections of the Baseline and the 'Export subsidy elimination plus reduction in import tariffs' scenario to the euro-dollar exchange rate is assessed in Appendix C.
- Finally, the 'Export subsidy elimination plus reduction in import tariffs' scenario simulates a uniform reduction in EU import tariffs across all agricultural commodities. Stuart Harbinson, WTO, gave his name to a complex formula for the reduction in export subsidies. Known as the Harbinson Formula, it had the highest reductions applied to the highest tariffs. The projections arising from a scenario, which incorporates differential tariff reductions approximating the Harbinson proposals, are presented in Appendix D.

4. Results of the Analysis

4.1 Dairy Sector Projections under the Baseline and the Scenarios

Figure 1: Scottish Producer Milk Price

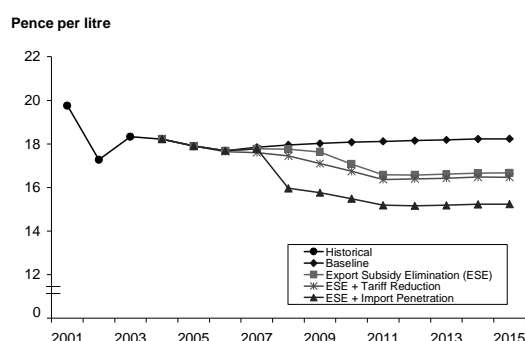


Figure 2: Scottish Milk Production

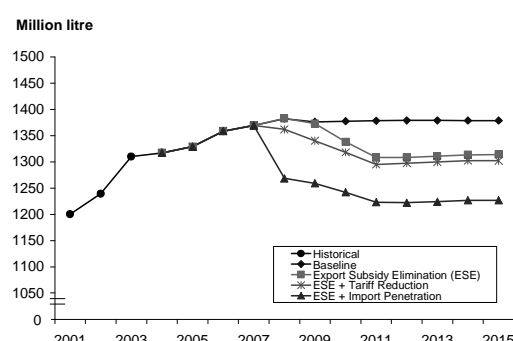


Table 1: Percentage Differences in Dairy Prices and Production between the Baseline and each Scenario, results refer to Scotland unless otherwise stated (year 2015)

	ESE	ESE + Tariff Reduction	ESE+ Import Penetration
	(%)	(%)	(%)
Prices			
Producer milk price	-9	-10	-16
UK Cheese price	-8	-9	-15
UK Butter price	-20	-20	-33
Production			
Milk production	-5	-6	-11
Dairy cows	-4	-5	-11
Cheese production	-9	-10	-20
Butter production	-20	-21	-34

Export Subsidy Elimination Scenario:

- Projected dairy commodity prices decrease significantly under the ESE scenario relative to the Baseline (Table 1). This reflects the fact that export refunds are used extensively in the dairy sector because EU dairy product prices are usually significantly higher than those that prevail on world markets. Dairy commodities, that previously would have been exported, remain in the EU market and exert a downward pressure on prices throughout the EU, including the UK.
- Projected export refunds are high for butter, compared to the other dairy commodities, under the Baseline and therefore this product experiences the greatest projected price decline following the elimination of export subsidies.

- The projected fall in UK dairy product prices under the ESE scenario leads to a significant decline, relative to the Baseline, in the projected Scottish milk producer price (Figure 1, Table 1). The decline in the Scottish milk producer price is slightly less pronounced than the other countries in the UK since Scotland does not produce whole milk powder, which is heavily dependent on export subsidies.
- The fall in projected milk producer price leads to a decline in Scottish milk production under the ESE elimination scenario (Figure 2 and Table 1).
- Given the decline in milk production, there is less milk available for manufacture. As a result, production of butter and cheese is significantly lower under the ESE scenario compared to the Baseline.
- The decline in milk production also exerts a downward impact on the number of dairy cows. By the end of the projection period the Scottish dairy herd is 4 per cent lower under the ESE scenario than the Baseline.

Export Subsidy Elimination and Tariff Reduction Scenario:

- Reducing tariffs, in addition to eliminating export subsidies, has a limited additional impact on dairy commodity prices (Table 1). As noted above, the elimination of EU export subsidies has a significant negative impact on EU dairy commodity prices and a positive impact on world prices. This widens the differential between 'EU internal prices' and 'World prices + URAA import tariffs', thereby enhancing the effectiveness of these tariffs in restricting the inflow of imports. Consequently, reducing these tariff levels by 60 per cent does not lead to a significant increase in imports from third countries into the EU and the impact on EU dairy commodity prices is marginal. As a result, there is little difference between the projected Scottish milk producer price under the ESE + Tariff Reduction scenario and the ESE scenario (Figure 1).

Export Subsidy Elimination and Increased Import Penetration Scenario:

- Butter and cheese prices are significantly lower under the ESE + Import Penetration scenario compared to the Baseline (Table 1). The additional fall in projected price is particularly severe for butter.
- With increased import penetration the lower projected commodity prices exert a strong negative impact on the milk producer price (Figure 2). By the end of the projection period, the projected Scottish milk producer price is 16 per cent lower than the Baseline and milk production is down 11 per cent.

4.2 Beef Sector Projections under the Baseline and the Scenarios

Figure 3: Average Scottish Producer Price of Clean Marketings

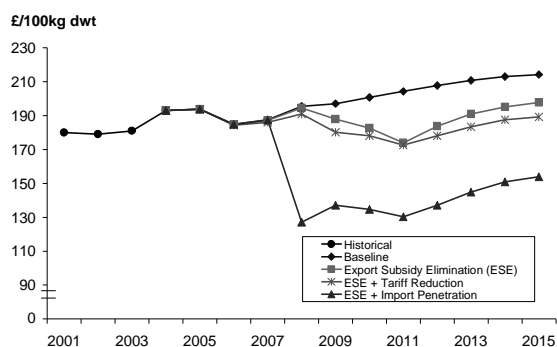


Figure 4: Scottish Suckler Cows

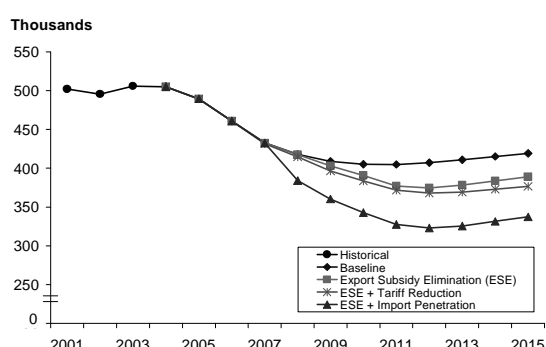


Table 2: Percentage Differences in Beef Sector Price and Production between the Baseline and each Scenario, results refer to Scotland (year 2015)

	ESE (%)	ESE + Tariff Reduction (%)	ESE+ Import Penetration (%)
Suckler cows	-7	-10	-20
Total cows	-6	-8	-16
Beef production	-6	-7	-16
Producer Price of Clean Marketings	-8	-12	-28

Export Subsidy Elimination Scenario:

- The elimination of export subsidies has a negative impact on projected cattle prices although this is negligible in the early years of the projection period since EU exports of beef are well below the URAA export subsidy limits in the Baseline. It is only in the latter years that there is a curtailment of exports and this reduces beef prices. By the end of the projection period the Scottish producer price of clean marketings under the ESE scenario is 8 per cent below the baseline (Figure 3 and Table 2).
- The elimination of export subsidies has a considerable negative impact on beef cow numbers in Scotland (Figure 4). The decline in beef cow numbers is exacerbated by a decline in the profitability of beef production because crop prices and hence input costs decline by only a small amount relative to beef prices. The projected decline in dairy cow numbers also exerts a negative impact on beef production in Scotland.

Export Subsidy Elimination and Tariff Reduction scenario:

- Reducing import tariffs leads to a further decline in cattle prices once export subsidies have been eliminated (Figure 3 and Table 2). However, the additional impact is limited. While there is a significant increase in EU imports from third countries under the ESE + Tariff Reduction scenario (EU imports are 16 per cent higher under this scenario relative to the Baseline), these extra imports only account for a small proportion of EU domestic consumption (around 1 per cent), thus curtailing the further fall in price.
- The decline in cattle prices exerts a negative impact on beef cow numbers in Scotland (Figure 4) and consequently beef production.

Export Subsidy Elimination and Increased Import Penetration Scenario:

- The elimination of export subsidies plus increased market access increases imports and has a very significant depressing impact on EU cattle prices. Projected EU beef imports under the ESE + Import Penetration scenario double relative to the Baseline and account for a considerable share of domestic consumption (EU imports account for 17 per cent of EU domestic consumption under the ESE + Import Penetration scenario in 2015, compared to 9 per cent under the Baseline).

Hence, most of the projected decline of 28 per cent in the Scottish beef price (Figure 3 and Table 2) reflects the impact of increased market access.

- The sharp decline in cattle prices exerts a negative impact on beef cow numbers (Figure 4) and consequently beef production. The decline in production due to the decline in beef prices is offset to a certain extent by lower crop and hence input prices. These very low projected beef prices call into question the financial viability of beef production in Scotland.

4.3 Sheep Sector Projections under the Scenarios and the Baseline

Figure 5: Average Scottish price of finished sheep and lambs

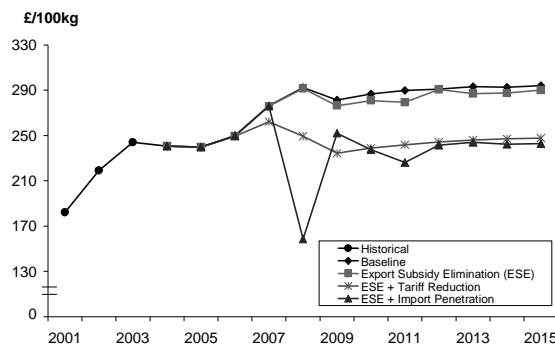


Figure 6: Scottish Ewes

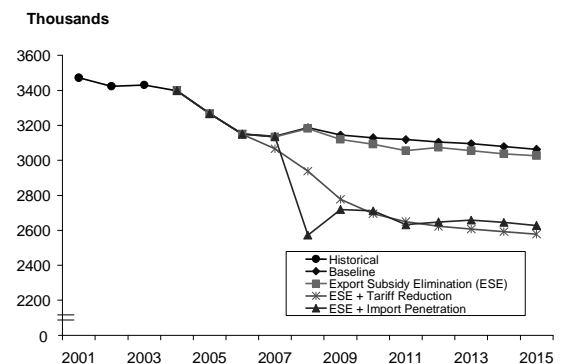


Table 3: Percentage Differences in Sheep Sector Price and Production between the Baseline and each Scenario, results refer to Scotland (year 2015)

	<i>ESE</i>	<i>ESE + Tariff Reduction</i>	<i>ESE+ Import Penetration</i>
	(%)	(%)	(%)
Ewes	-1	-16	-14
Sheep production	-2	-16	-14
Producer price of finished sheep and lambs	-1	-16	-17

Export Subsidy Elimination Scenario:

- The projected Scottish sheepmeat price declines by a small amount following the elimination of export subsidies (Figure 5 and Table 3). By the end of the projection period the price of finished sheep and lambs is 1 per cent lower under the ESE scenario compared to the Baseline. This reflects the fact that EU export subsidies have not been a significant feature of the EU sheep sector in recent years. The negative price impact is purely a cross-price impact. The projected fall in other

meat prices reduces the demand for sheepmeat and consequently this causes a modest sheepmeat price decline.

- In response to the slightly lower prices, projected ewe numbers in Scotland decrease by 1 per cent under the ESE scenario compared to the Baseline (Figure 6 and Table 3).

Export Subsidy Elimination and Tariff Reduction Scenario:

- The reduction in EU sheepmeat import tariffs plus the elimination of export subsidies has a significant depressing impact on projected Scottish sheepmeat prices (Figure 5 and Table 3). As described in the discussion of the previous scenario, unlike the other meat sectors, the decline in sheepmeat price is insignificant following the elimination of export subsidies. Consequently, once import tariffs are reduced by 60 per cent, the differential between 'EU internal prices' and 'World prices + URAA import tariffs' is insufficient to prevent the inflow of imports, and this leads to a significant price decline of 16 per cent.
- The decrease in sheepmeat prices has a depressing effect on Scottish ewe numbers (Figure 6). By the end of the projection period, ewe numbers are 16 per cent lower under the ESE + Tariff Reduction scenario compared to the Baseline.

Export Subsidy Elimination and Increased Import Penetration Scenario:

- The increase in EU sheepmeat market access, together with the elimination of export subsidies, has a slightly greater negative impact on the projected Scottish sheepmeat price than the reduction in import tariffs (Figure 5 and Table 3).
- The decrease in sheepmeat prices reduces Scottish ewe numbers (Figure 6). By the end of the projection period, ewe numbers are 14 per cent lower under the ESE + Import Penetration scenario than under the Baseline. Note that the projected fall in ewe numbers relative to the Baseline under this scenario is lower than the fall that occurs under the ESE + Tariff Reduction scenario, despite the fact that the decline in sheepmeat prices is less in the latter. This is because crop prices, and hence input prices, fall by a greater amount under the ESE + Import Penetration scenario (see the following section on the impacts on the arable sector).

4.4 Arable Sector Projections under the Baseline and Scenarios

Figure 7: UK Wheat Price

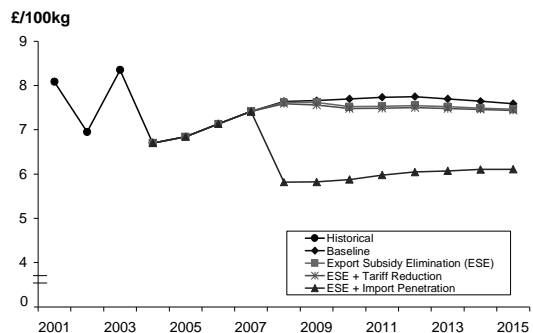


Figure 8: UK Barley Price

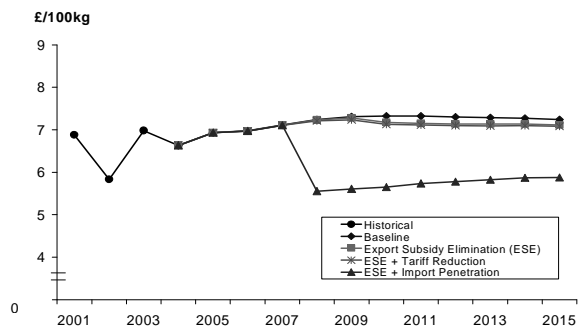


Figure 9: UK Rapeseed Price

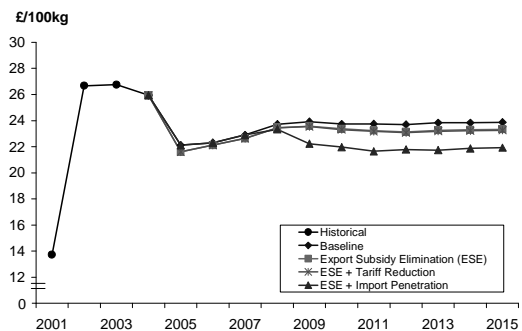


Table 4: Percentage differences in Crop Prices and Production between the Baseline and each Scenario, results refer to Scotland unless otherwise stated (year 2015)

	<i>ESE</i>	<i>ESE + Tariff Reduction</i>	<i>ESE + Import Penetration</i>
	(%)	(%)	(%)
UK Prices			
Wheat	-2	-2	-20
Barley	-2	-2	-19
Rapeseed	-1	-1	-8
Production			
Wheat	0	0	0
Barley	0	0	0
Rapeseed	0	0	0

Export Subsidy Elimination Scenario:

- The elimination of export subsidies has a very small impact on the arable sector. The projected UK crop prices decrease marginally (Figures 7 and 8 and Table 4) due to little reliance on export subsidies.
- Given the limited price impact following the elimination of export subsidies, Scottish production of wheat, barley and rapeseed under the ESE scenario are not significantly different from the Baseline.

Export Subsidy Elimination and Tariff Reduction Scenario:

- The reduction in import tariffs and the elimination of export subsidies exerts a negligible impact on UK prices (Figures 7 and 8 and Table 4) because there still exists a significant tariff barrier. By the end of the projection period, wheat and barley prices are 2 per cent lower and the rapeseed price 1 per cent lower than the Baseline. Despite the reduction, it is projected that import tariffs are still effective in preventing a surge in imports.
- The tariff reductions have little impact on the production of crops in Scotland.

Export Subsidy Elimination and Increased Import Penetration Scenario:

- The increase in EU market access and the elimination of export subsidies has a very strong depressing effect on prices (Figures 7 and 8 and Table 4). By the end of the projection period, UK wheat, barley and rapeseed prices are respectively 20 per cent, 19 per cent and 8 per cent lower than the Baseline.
- Despite the decline in prices, the modelling system projections reflect continued crop production. Production levels of wheat, barley and rapeseed in Scotland under the ESE and increased import penetration scenario are similar to those under the Baseline.

5. Conclusions

5.1 Export Subsidy Elimination

- The widespread use of export subsidies within the dairy sector means that the elimination of these subsidies has a particularly severe impact on dairy commodity prices. The price effect is particularly pronounced for butter. As a result, the Scottish milk producer price is significantly lower under the ESE scenario compared to the Baseline. The lower milk price has a slight negative impact on milk production in Scotland.
- In the beef sector, the elimination of export subsidies leads to lower prices and thus a decline in production, relative to the Baseline. Beef that previously would have been exported with subsidy support remains in the EU market. Given the fall in projected beef prices, there is a considerable decline in animal numbers and production levels in Scotland.
- Elimination of export subsidies also leads to a decline, relative to the Baseline, in projected Scottish sheepmeat prices and production. However, the decline is much less marked than in the beef sector, since the sheep sector is not reliant on export subsidies. The fall in projected sheep prices is entirely due to cross-price effects. The fall in other meat prices reduces the demand for sheepmeat, which exerts a slight downward impact on sheepmeat prices.
- The elimination of export subsidies has only a slight projected impact on the arable sector with a marginal decline in projected UK prices and no change in production in Scotland due to little reliance on export subsidies.

5.2 Export Subsidy Elimination and Import Tariff Reduction

- Tariff reductions do not add significantly to the projected price and production impacts of the elimination of export subsidies in the dairy sector. The depressing impact of export subsidy elimination on prices enhances the effectiveness of import tariffs in protecting the EU market. Consequently, even when import tariffs are reduced by 60 per cent, they still stem the inflow of imports from third countries into the EU.

- In the beef sector it is projected that reducing import tariffs, in addition to eliminating export subsidies, causes prices and production in Scotland to fall further. The impact, however, is limited as the tariffs are still largely effective in preventing third country exporters from flooding the EU market with beef.
- Import tariff reductions, in addition to eliminating export subsidies, however, have a significant impact on the sheep sector. The small projected price impact due to the elimination of export subsidies means that reductions in import tariffs lead to a large increase in imports into the EU from third countries. This causes Scottish sheepmeat prices and hence production to fall.
- In the arable sector, import tariff reductions, in addition to eliminating export subsidies, have little impact on prices and production. It is projected that the reduced tariffs are still effective in stemming the inflow of crop imports.

5.3 Export Subsidy Elimination and Import Penetration

- In general, increasing imports by 10 per cent of EU domestic consumption has a significant impact on projected prices. Imports generate extra supply. Due to the elimination of export subsidies, the market cannot clear via subsidised exports; hence prices decline and discourage production.
- In the dairy sector, butter and cheese prices decline sharply under this scenario due to imports displacing domestic production. The projected decline in butter and cheese prices has a negative impact on the Scottish milk producer price. There is a corresponding decline in milk production in Scotland.
- Increased import penetration has a significant effect on prices in the beef, sheep and arable sectors due to imports displacing EU production. The decline in prices in the beef and sheep sectors exerts a downward impact on production in Scotland in these sectors although this is offset slightly by the decline in crop prices and hence input costs.

Appendix A

Macroeconomic Assumptions

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Real GDP growth													
EU-15	percent	2.0%	1.9%	2.0%	2.3%	2.1%	2.0%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%
France	percent	2.1%	1.8%	2.0%	2.3%	2.0%	1.9%	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%
Germany	percent	1.2%	1.4%	1.7%	1.8%	1.7%	1.6%	1.7%	1.7%	1.7%	1.7%	1.6%	1.7%
Italy	percent	1.2%	1.4%	1.8%	2.1%	1.9%	1.8%	1.9%	2.0%	2.0%	2.0%	2.0%	2.1%
United Kingdom	percent	3.2%	2.6%	2.4%	2.8%	2.6%	2.5%	2.6%	2.6%	2.5%	2.5%	2.5%	2.4%
Other EU	percent	2.5%	2.2%	2.3%	2.5%	2.3%	2.2%	2.2%	2.3%	2.2%	2.3%	2.2%	2.2%
NMS-10	percent	5.1%	4.6%	4.7%	4.7%	4.3%	4.1%	4.1%	4.0%	3.9%	3.9%	4.0%	3.9%
Poland	percent	5.6%	5.0%	4.9%	4.7%	4.6%	3.9%	3.9%	4.0%	4.0%	3.9%	4.2%	4.0%
Hungary	percent	3.9%	3.5%	3.7%	4.1%	3.1%	3.8%	3.9%	3.4%	3.4%	3.4%	3.2%	3.2%
Other Candidates	percent	5.0%	4.5%	4.4%	4.7%	4.5%	4.3%	4.3%	4.1%	3.9%	3.9%	3.9%	3.9%
Inflation (GDP deflator)													
EU-15	percent	2.9%	1.7%	1.9%	1.7%	1.8%	1.9%	1.9%	1.8%	1.8%	1.8%	1.8%	1.8%
France	percent	1.8%	2.1%	2.3%	1.8%	1.8%	1.9%	1.9%	1.8%	1.7%	1.8%	1.8%	1.8%
Germany	percent	1.0%	1.0%	1.8%	1.4%	1.2%	1.2%	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%
Italy	percent	2.6%	2.2%	2.6%	2.2%	2.0%	2.0%	1.9%	1.7%	1.6%	1.7%	1.7%	1.7%
United Kingdom	percent	2.1%	2.5%	2.9%	2.3%	2.5%	2.4%	2.4%	2.3%	2.3%	2.2%	2.2%	2.2%
NMS-10	percent	3.9%	3.0%	2.6%	2.5%	2.2%	2.3%	2.3%	2.3%	2.3%	2.4%	2.4%	2.4%
Poland	percent	2.4%	2.0%	2.1%	2.4%	2.4%	2.6%	2.4%	2.5%	2.3%	2.5%	2.4%	2.4%
Hungary	percent	5.4%	4.0%	3.0%	2.6%	2.0%	2.1%	2.1%	2.2%	2.2%	2.3%	2.3%	2.3%
Exchange rate vs. dollar													
EU-15	euro/\$	0.81	0.72	0.68	0.67	0.68	0.69	0.69	0.70	0.70	0.70	0.70	0.71
France	FF/\$	5.32	4.70	4.47	4.42	4.48	4.51	4.54	4.56	4.58	4.59	4.61	4.63
Germany	DM/\$	1.59	1.40	1.33	1.32	1.33	1.34	1.35	1.36	1.36	1.37	1.37	1.38
Italy	IL/\$	1569.57	1386.34	1319.48	1305.64	1321.62	1330.59	1339.75	1346.57	1351.06	1355.54	1360.41	1365.31
United Kingdom	£/\$	0.55	0.50	0.48	0.49	0.50	0.50	0.50	0.51	0.51	0.51	0.51	0.51
NMS-10	euro/\$	0.81	0.72	0.68	0.67	0.68	0.69	0.69	0.70	0.70	0.70	0.70	0.71
Poland	ZL/\$	3.75	3.05	2.94	2.92	2.96	2.98	3.00	3.01	3.02	3.03	3.04	3.05
Hungary	FL/\$	204.50	179.45	166.78	164.29	166.30	167.43	168.58	169.44	170.00	170.57	171.18	171.80
Exchange rate vs. euro													
France	FF/euro	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56
Germany	DM/euro	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Italy	IL/euro	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27	1936.27
United Kingdom	£/euro	0.68	0.69	0.71	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Poland	ZL/euro	4.63	4.26	4.31	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
Hungary	FL/euro	252.28	250.63	244.75	243.64	243.64	243.64	243.64	243.64	243.64	243.64	243.64	243.64
Other exchange rates													
Dollars per euro	\$/euro	1.23	1.40	1.47	1.48	1.47	1.46	1.45	1.44	1.43	1.43	1.42	1.42
Dollars per UK pound	\$/£	1.82	2.02	2.07	2.05	2.01	2.00	1.98	1.97	1.97	1.96	1.95	1.95
Euro per UK pound	euro/£	1.48	1.45	1.41	1.38	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37
Population													
EU-15	million	381.2	382.1	382.9	383.6	384.2	384.7	385.2	385.7	386.1	386.5	386.9	387.2
France	million	60.1	60.3	60.5	60.6	60.8	61.0	61.2	61.3	61.5	61.6	61.7	61.9
Germany	million	82.5	82.6	82.7	82.7	82.8	82.8	82.8	82.8	82.8	82.8	82.8	82.8
Italy	million	57.7	57.9	58.0	58.1	58.2	58.3	58.3	58.4	58.4	58.5	58.6	58.6
United Kingdom	million	59.8	59.9	60.0	60.1	60.2	60.3	60.4	60.5	60.6	60.7	60.8	60.8
Other EU	million	121.1	121.4	121.7	122.0	122.2	122.4	122.5	122.6	122.8	122.9	123.0	123.1
NMS-10	million	74.4	74.3	74.1	74.0	73.9	73.8	73.6	73.5	73.3	73.2	73.0	72.8
Poland	million	38.5	38.5	38.5	38.5	38.4	38.4	38.4	38.4	38.3	38.3	38.2	38.2
Hungary	million	10.0	10.0	9.9	9.8	9.8	9.7	9.6	9.6	9.5	9.5	9.4	9.3
Other Candidates	million	25.8	25.8	25.8	25.7	25.7	25.6	25.6	25.5	25.5	25.4	25.4	25.3

Appendix B

Continuation of OTMS

This scenario incorporates all of the assumptions regarding ongoing policies of the Baseline with the exception that it is assumed that OTMS continues and the beef export ban remains in place throughout the projection period. The scenario with the continuation of OTMS is compared against the Baseline (in which OTMS ends at the end of 2005 and beef exports resume in 2006) to assess how beef production and beef prices would have differed had OTMS continued. The price and production impacts of the continuation of the OTMS are plotted in Figures B1 and B2 below.

Figure B1: Scotland Beef Production

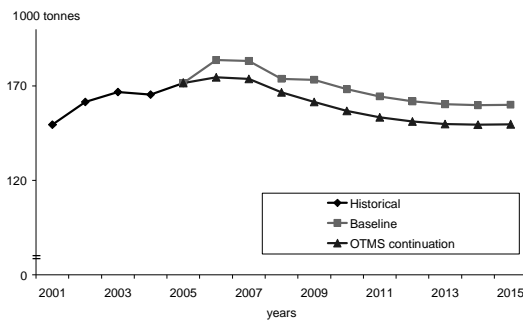
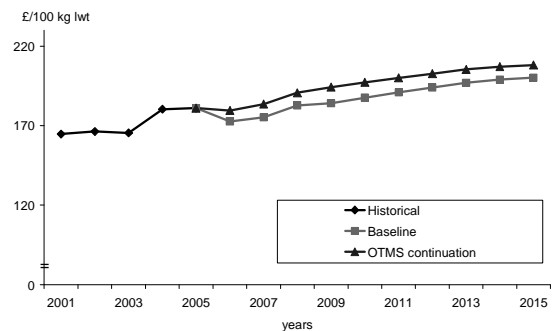


Figure B2: Producer Price of Clean Marketings



Beef production is 6 per cent lower in 2015 under the 'Continuation of OTMS' scenario compared to the Baseline (in which OTMS ends) because animals are slaughtered under the former and do not enter the beef production chain (see Figure B1). This is markedly lower than the average UK decline of 27 per cent. The main reason for the regional differences is the relative size of beef and dairy sectors. There are fewer dairy cattle relative to beef cattle in Scotland compared to elsewhere in the UK. Given that dairy cows are kept for a shorter period of time for breeding purposes than beef cows the throughput of cattle into OTMS is smaller in Scotland compared to the other regions. The lower levels of production under the 'Continuation of OTMS' scenario result in higher beef prices compared to the Baseline (Figure B2). By the end of the projection period, beef prices are 4 per cent higher under the 'Continuation of OTMS' scenario compared to the Baseline.

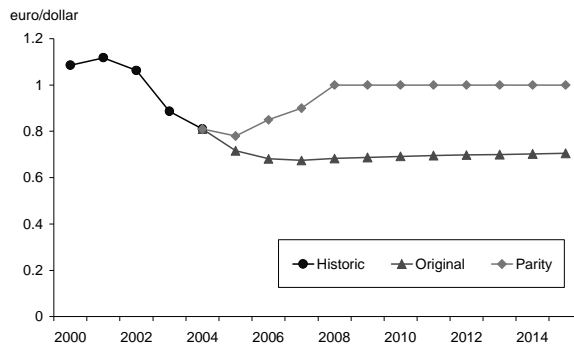
Appendix C

Sensitivity Analysis assuming a euro/US dollar Parity Exchange Rate by 2015

The preceding results for the policy scenarios are sensitive to the euro-dollar exchange because of the importance of this exchange rate in influencing the level of trade between the EU and the rest of the world. In the original analyses the euro strengthens against the dollar, moving from 0.81 euros/dollar in 2004 to 0.71 euros/dollar in 2015 (see Appendix A).

In order to determine the sensitivity of the aforementioned results to the euro-dollar exchange rate, the Baseline and the Export Subsidy Elimination plus Import Tariff Reduction scenario are both simulated using an alternative exchange rate. In this analysis the euro weakens relative to the dollar i.e. shifts from 0.81 euros/dollar in 2004 to 1 euro/dollar from 2008 to the end of the projection period (see Figure C1).

Figure C1: Original and 'Parity' euro-dollar exchange rates



Under the Parity exchange rate, as in the original analysis, export subsidy elimination plus tariff reduction has a depressing impact on commodity prices, relative to the Baseline. The negative impact, however, is less pronounced under the Parity exchange rate compared to the Original exchange rate (see Table C1). As the euro is weaker, EU commodities are more competitive on the world market.

Consequently, less export subsidies are required under the Parity exchange rate compared to the Original exchange rate. It follows therefore that the impact of eliminating export subsidies is less significant under the former. In addition, the improved competitiveness of EU commodities under the Parity exchange rate means that reducing import tariffs has less of an impact.

The impact of the Parity exchange rate is most marked in the sheep sector. Using the original exchange rate, Scottish sheepmeat prices are 16 per cent lower under the export subsidy elimination plus tariff reduction compared to the Baseline, while they are 5 per cent lower when the Parity exchange rate is employed.

In the dairy sector the decline in commodity prices, and hence the producer price of milk, is less pronounced under the Parity exchange rate compared to the Original exchange rate. Under these conditions Scottish milk production actually increases, as there is a small net movement in milk quota from England to the other countries in the UK.

Table C1: Percentage difference between Baseline and Export Subsidy Elimination plus Import Tariff Reduction scenario under different exchange rates (year 2015), results refer to Scotland unless otherwise stated

	<i>Original Exchange Rate</i> (%)	<i>Parity Exchange Rate</i> (%)
Dairy Sector		
Producer milk price	-10	-7
UK Cheese price	-9	-7
UK Butter price	-20	-19
Milk production	-6	1
Dairy cows	-5	1
Cheese production	-10	1
Butter production	-21	-15
Beef Sector		
Suckler cows	-10	-8
Total cows	-8	-5
Beef production	-7	-5
Producer price of clean marketings	-12	-9
Sheep Sector		
Ewes	-16	-4
Sheepmeat production	-16	-4
Producer price of finished sheep and lambs	-16	-5
Arable Sector		
<i>Price</i>		
UK Wheat	-2	-1
UK Barley	-1	-1
UK Rapeseed		
<i>Production</i>		
Wheat	0	0
Barley	0	0
Rapeseed	0	0

Appendix D
Export Subsidy Elimination plus Differential Tariff Reduction
(Harbinson) Scenario

Under the 'ESE + Tariff Reduction' scenario, discussed in the main paper, import tariffs were reduced by a uniform rate (60 per cent) across all commodities and analysis of the scenario illustrated which sectors were particularly sensitive to cuts in import tariffs. In reality, the framework calls for a differentiated approach whereby the highest tariffs are reduced by the greatest amount.

A scenario which applies differential tariff cuts in which import tariffs for beef and butter were reduced by 60 per cent and all other commodities were reduced by 50 per cent was analysed. The ESE plus differential tariff reduction scenario generated projections that are only marginally different from the ESE plus Tariff Reduction scenario (See Tables D1 and D2). These differences are expressed in slightly smaller reductions in prices and production compared to the tariff reduction scenario previously described. Nevertheless, with exception to the sheep sector, which as already stated is vulnerable to import tariff cuts, the differences are negligible.

Table D1: Percentage difference between Baseline and Scenarios (year 2015) in the Dairy and Beef Sectors, results refer to Scotland unless otherwise stated

	<i>Export Subsidy Elimination + Tariff Reduction</i>	<i>Export Subsidy Elimination + Differential Tariff Reduction</i>
	(%)	(%)
Dairy Sector		
Producer milk price	-11	-11
UK Cheese price	-9	-8
UK Butter price	-20	-20
Milk production	-6	-5
Dairy cows	-5	-5
Cheese production	-10	-9
Butter production	-21	-21
Beef Sector		
Suckler cows	-10	-10
Total cows	-8	-8
Beef production	-7	-7
Producer price of clean marketings	-12	-12

Table D2: Percentage difference between Baseline and Scenarios (year 2015) in the Sheep and Arable Sectors, results refer to Scotland unless otherwise stated.

	<i>Export Subsidy Elimination + Tariff Reduction</i>	<i>Export Subsidy Elimination + Differential Tariff Reduction</i>
	(%)	(%)
Sheep Sector		
Ewes	-16	-13
Sheepmeat production	-16	-13
Producer price of finished sheep and lambs	-16	-13
Arable Sector		
<i>Prices</i>		
UK Wheat	-2	-2
UK Barley	-2	-2
UK Rapeseed	-1	-1
<i>Production</i>		
Wheat production	0	0
Barley production	0	0
Rapeseed production	0	0