LMC INTERNATIONAL

EVALUATION OF MEASURES RELATING TO THE DURUM WHEAT SECTOR WITHIN THE CONTEXT OF THE COMMON AGRICULTURAL POLICY

Final

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Main Report

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Chapter 1: Introduction

1.1 Background

This evaluation examines the impact of measures of the Common Agricultural Policy (CAP) applied in the durum wheat sector. It is part of a set of ongoing evaluations of CAP measures concerning sectors subject to past or present direct support.

It covers all CAP measures defined under Council Regulation (EC) No 1782/2003 and all subsequent measures related to the durum wheat sector. The regulation was implemented in the period 2004-2006 and the evaluation deals with the period from 2005/06 to 2007/08. The overview of the sector covers the period 2000/01 to 2007/08.

Council Regulation (EC) No 1782/2003 sought to increase the market orientation of the agricultural sector and established common rules for direct support schemes under the CAP and introduced a new system of decoupled payments linked to cross compliance requirements. Concerning durum wheat, recital n° 35 identified the objective of the support for durum wheat as *being the maintenance of the role of durum wheat production in traditional production areas while strengthening the granting of the aid to durum wheat respecting certain minimum quality requirements*.

1.2 Tools and methodology

1.2.1 Case studies

Country monographs and case studies provide valuable information about the sector. These are provided for France, Greece, Italy and Spain. Over the 2000/01 to 2007/08 period, these countries accounted for 96% of the total durum wheat area. Within these countries, interviews were held with government officials, industry associations, farmers and processors. Interviews with farmers were held in:

- France: The Centre region (primarily the departments of Eure-et-Loir, Loir-et-Cher, and Loiret). The region is a non-traditional producing region. It is the largest single durum wheat producing region in France.
- Greece: Central Macedonia is a traditional durum wheat production area and includes three of the six top durum wheat-producing prefectures in Greece (Thessaloniki, Kilkis and Chalkidiki).
- Italy: Puglia, the largest durum wheat producing region.
- Spain: Andalucia, Spain's most important durum wheat producing area.

1.2.2 Analysis of gross margins

The key component of the evaluation is the calculation of production costs and gross margins. These are then used as a basis for calculating simple supply elasticities to analyse the effect of a change in gross margin on the area under durum wheat.

FADN data are used to calculate production costs and gross margins for durum wheat and competing crops. For durum wheat, costs and margins are calculated by focussing specifically on durum wheat specialists in traditional areas. These have been defined as follows:

- In Greece, Italy and Spain, a farm is classified as durum wheat specialist if at least 75% of total utilised agricultural area is planted to durum wheat. To ensure that the analysis covers the traditional regions, we have further restricted the FADN data used. In Greece we use observations of specialists across the whole country; in Italy, we use FADN

observations from the Southern producing regions of Campania, Calabria, Puglia, Basilicata, Sicila and Sardegna; while in Spain we use observations from the southern producing regions of Andalucia and Extremadura. The regions have also been selected to coincide with the case study regions.

- In France, this benchmark for durum wheat specialists has been set at 60% to ensure that a large enough sample is captured in the analysis. The regions covered by the data are the Southern producing regions of Midi-Pyrénées, Rhône-Alpes, Languedoc-Roussillon and Provence-Alpes-Côte d'Azur.

Table 1.1 shows the number of observations in the FADN analysis.

Table 1.1: FADN: Number of Durum Wheat Specialists

	2000	2001	2002	2003	2004	2005	2006
Observations							
France	11	19	9	9	18	21	24
Greece	254	292	275	266	264	259	156
Italy	638	652	828	736	657	500	399
Spain	14	25	26	61	39	44	47

Source: FADN

Given that the FADN sample of farms changes each year, where possible, the findings are confirmed by examining data for a cohort of farms. This has only been possible in Greece and Italy, where the sample is large enough.

The similar analysis for non-traditional areas was not possible as the sample sizes are very small.

From the FADN data costs are split between fixed and variable costs on a per hectare basis (costs are divided by the total farmed area). As the observations are for durum wheat specialists it is assumed that all costs are attributed to durum wheat as it is not possible to divide FADN costs between individual farm enterprises. The gross margins are then calculated as the per hectare revenue from durum wheat production (a combination of the durum wheat sales price and coupled support measures) minus variable costs.

The main limitations of this methodology and of using FADN data are that the data are only available to 2006. This does though give at least one year's worth of observations following the adoption of the reforms (the reform was introduced in 2005 in Italy and 2006 in Spain, France and Greece). To overcome this, for 2007 and 2008, we seek to update the FADN data. On the cost side, we first make use of questionnaire responses. Farmers were asked how their use of inputs had changed. In most cases, it was stated they had not changed and we therefore assume that the intensity of input use remains unchanged at 2006 levels. Second, the 2006 FADN data are adjusted to reflect changes in the prices of the individual cost components in 2007 and 2008. These cost data were collected from national sources of price, production cost and gross margin data. On the revenue side, per hectare support measures are assumed unchanged between 2006 and 2008, except for Article 69 where we have national data for annual support levels. The durum wheat price was adjusted to reflect changes in international prices as reflected in Eurostat prices for each individual country.

For the alternative crops, the methodology is similar. We have sought to restrict the FADN data to the same regions as was considered for traditional areas to ensure we are comparing costs in similar regions under similar growing conditions. We have used two FADN samples to calculate production costs and gross margins:

- Our preferred method was to use the FADN data showing producers of durum wheat. The sample was of all farms growing durum wheat in the FADN survey. In the case where a low proportion of the area was under durum wheat, we could determine other crop specialisation and work out costs and margins accordingly. For instance if a farm had 25% durum wheat and 75% common wheat we would classify the farm as a common wheat specialist. The use of this data set has the advantage that is covers farms where it is possible to grow durum wheat. The disadvantage being that the sample size was often very small which meant we could not use it in the analysis. This data set was used for Greece (for Maize and common wheat);

- FADN data showing COP crop specialists and cotton specialists (in the case of Greece) in the durum wheat traditional areas. In order to obtain a sufficiently large sample size from the FADN data and minimise problems in the allocation of overhead costs, we took farms with over 60% of their total area from their major crop in the cases of common wheat and maize and over 50% for sunflower. In the case of Italy, the sample size for common wheat in the southern areas was insufficient and hence data were used for the Centre regions. These are also traditional growing areas.

The calculation of production costs and gross margins was along the same lines as that used for durum wheat.

1.2.3 Analysis of producer responses to changes in policy and in crop profitability

Producers' reactions to changes in policy are typically determined by the price that they receive for their production, the profitability of production and their ability to switch between crops. Comparing pricing and profitability with changes in crop areas over time allow us to calculate supply elasticities. This is the basis for analysing changes in policy and the counterfactual case where coupled aid is abolished.

In principle, it would be desirable to develop an econometric model to model the changes in area and production brought about by the reform and simulate the impact of alternative policy reforms. However, a major difficulty in this approach is that there are limited observations of the new regime. Consequently, most of the observations reveal farmers' reactions to relatively small changes in grower prices prior to the introduction of the 2003 reform. It is unclear whether a model based on these relatively small differences in price would capture reactions to the large changes in gross margins that occurred with the change in regime.

This suggests an alternative approach is required. It is less precise in quantitative terms, but it does allow us to determine how farmers responded to the change in regime and how they would be likely to respond to further change.

Through the calculation of gross margins we can derive quantitative estimates of the way changes in the regime have fed through to farm incomes. Then, by examining how areas have changed, we can calculate simple elasticities.

We calculate two supply elasticities. The first is constructed using historical data by examining changes in relative gross margins versus changes in relative areas under alternative non-irrigated COP crops in the following crop year (assuming an adaptive model). The supply elasticity is expressed in terms of the % change in the durum wheat share of the total non-irrigated COP area divided by the % change in the relative gross margins for durum wheat and other non-irrigated COP crops the previous year. In the year in which the policy changed, we alter the relative gross margin to take account of the change in the level of support following the policy change as farmers knew of this change in advance and this would have helped inform their decision making. This measure of the elasticity is used as it takes into account

competition from other crops and the effect of set aside on the land area. The second, an alternative, is to calculate a supply elasticity just for durum wheat, irrespective of changes to alternative crops. This is calculated as the % change in area of durum wheat divided by the % net margin change for durum wheat.

There are a number of factors that could undermine this approach and warrant a second method for calculating elasticities. In particular:

- The extent to which producers see themselves as price takers. Where this is the case, this means that producers see prices as a given rather than something that is influenced by their planting decisions.
- The importance of family labour. Where family labour is an important component of the labour input, the farmers' production decision is not just based on the return per hectare but may be based instead on the number of days of labour that an activity provides in a profitable manner. In the latter case, the total income is more important that the return per hectare.

In order to overcome these limitations, questionnaires were used to analyse farmers' responses to changes in policy. These responses were gained from questions about their actual responses to the 2003 reform, as well as a series of "what if" questions in terms of changes to policy, in order to gain an impression of how farmers would respond, such as "how would you adapt your choice of crop and input use to, say, a 10% reduction in the price you receive for the crop being evaluated?", "To a 20% price reduction?", and "How did you respond in terms of plantings and input use to the reforms?".

From the farmers' responses we would be able to develop a series of fairly qualitative "pseudo-elasticities", which would give us a guide as to the strength of responses to particular policy changes.

The use of both methods allows us to assess the impact of policy changes on the area under durum wheat.

1.2.4 Farmer surveys

For the fieldwork in the four case study areas, 96 farmers were interviewed (Greece 40, Italy 30, Spain 15 and France 11). Farmers were selected in association with industry organisations or cooperatives in the case study regions. While not a random sample, the responses give an indication of trends. Interviews were by means of a questionnaire and in most cases based on face-to-face interviews. The interviews followed three main areas of investigation:

- Farmers' cropping decisions, crop rotations and how these have changed over time;
- Data on key aspects of production and costs, including input use and employment; and
- Responses to changes in policy. This would include the response to changes to the quality premium and a fully decoupled system.

These questionnaires were backed up by interviews with producer associations. These interviews were used to provide background data, to provide an understanding of industry trends and the impact of the policy reform.

1.2.5 Durum wheat processor surveys

The processing sector comprises two main segments:

- Milling of grain into semolina, and
- Processing semolina to either pasta or couscous.

Data collection followed the same principles as those used for farmers. Interviews were held with industry associations and a sample of individual processors. 17 interviews were conducted (Greece (6), Italy (6), France (3), Spain (2)) covering 33 plants. Interviews were a mixture of face-to-face interviews and telephone interviews.

Questions for the processors focussed on the importance of the availability of domestic supplies of durum wheat, the suitability of the qualities that are available, and the degree of competition from foreign suppliers.

Interviews were held across the case study countries as the processing factories are not necessarily in the case study regions. Interviews with industry association were used to provide background data and to provide an understanding of industry trends.

1.3 Data sources

The analysis behind this evaluation relies on four main sources of data:

- Eurostat, National and regional data bases;
- Farm Accountancy Data Network (FADN);
- Questionnaires (both of producers and processors);
- Interviews with government representatives, industry associations;

Where possible, in answering the evaluation questions, data from one source has been backed up and supported by evidence from another source.

Chapter 2: Description of Intervention Measures

The first part of this chapter provides an overview of the budgetary cost of the measures affecting the durum wheat sector, while the second part presents an inventory of the measures affecting the sector, and the changes in these measures over time.

2.1 Budgetary cost

Prior to the adoption of the reforms to the CAP under the mid-term review of Agenda 2000, support measures for the durum wheat sector cost in the order of €1 billion annually. Italy was the largest beneficiary followed by Spain, France and Greece (Table 2.1). Following the implementation of the reforms and the decoupling of support, the direct cost of durum wheat support measures fell to €247 million in 2008.

Table 2.1: The budgetary cost of durum wheat support measures (€ million)

Country	Area	2000	2001	2002	2003	2004	2005	2006	2007	2008
Austria	Traditional	2.27	2.21	2.21	2.22	2.41	2.44	0.26	0.28	0.26
Germany	Non traditional	1.39	0.89	0.11	0.11	0.86	0.67	-0.04	0.00	0.00
Spain		200.95	151.58	148.46	150.35	202.42	206.27	186.21	62.47	50.59
Incl:	Non traditional	.	0.48	0.49	0.45	0.55	0.36	0.18	0.00	0.00
	Traditional	200.95	151.10	147.97	149.90	201.87	205.90	186.03	62.47	50.59
France		75.41	78.66	75.24	78.22	77.90	74.80	66.45	22.22	21.38
Incl:	Non traditional	.	6.90	6.75	6.93	6.91	4.47	2.14	0.00	0.00
	Traditional	75.41	71.75	68.48	71.28	70.99	70.33	64.31	22.22	21.38
UK	Non traditional	0.58	0.60	0.58	0.33	0.49	0.15	0.00	0.00	0.00
Greece	Traditional	204.89	210.67	210.11	207.34	208.65	214.18	193.28	86.64	63.65
Italy		501.02	523.30	740.77	382.97	580.45	570.32	127.10	106.53	110.94
Incl:	Non traditional	.	0.43	0.51	0.56	0.59	0.41	0.02	0.00	0.00
	Traditional	501.02	522.87	740.25	382.42	579.86	569.91	127.08	106.53	110.94
Portugal	Traditional	19.67	56.09	22.45	39.31	39.80	40.63	0.22	0.09	0.04
Total		**1,006.18**	**1,023.99**	**1,199.92**	**860.84**	**1,112.97**	**1,109.46**	**573.47**	**278.23**	**246.86**

Note: Payments for Art 69 for Italy and Greece are calculated as durum wheat area * per hectare payment

Source: DG Agri,

2.2 Measures affecting the durum wheat market

The reforms that occurred in the measures for durum wheat during the review period (2000/01-2007/08) can best be understood in the context of the wider reforms in the CAP. In particular, the move away from price supports to support for rural incomes and the promotion of rural development and environmental objectives.

In this section, we discuss reforms beginning in 1992 when intervention prices began to be moved in line with world market prices and area payments were made to compensate producers for a loss of income resulting from the changes.

2.2.1 MacSharry reforms (1992)

Prior to the MacSharry CAP reform, support was based on a system of guaranteed prices. This supported prices above international prices, thus encouraging production and exports over imports. Under the MacSharry reform, intervention prices were reduced and brought more in line with world market prices and unified across the cereals sector[1]. In order to compensate

[1] Council Regulation (EEC) No 1766/92 of 30 June 1992 *(OJ L 181, 01.07.1992 p. 21-39).*

producers for the loss of income resulting from the fall in intervention prices growers were provided with a fixed payment per hectare (direct aid)[2]. This *compensatory payment* was determined by a *basic amount*[3] which was multiplied by a *regional reference yield for cereals*[4].

In addition to compensatory payments, a supplement was paid to durum wheat producers in traditional areas in order to compensate them for the loss of income that occurred with the alignment of cereal prices. The supplement was fixed at 297 ECU per hectare.

2.2.2 The 1997 reform

In 1997, the support system for durum wheat was further modified[5]. Each member state was given a maximum guaranteed area (MGA) in the traditional areas on which the durum wheat supplement was payable. The compensation payment was increased to 344.5 ECU per hectare, but where the actual planted area was greater than the MGA, the level of compensation payment was reduced proportionately.

The regulation also created a special aid of 138.9 ECU per hectare for production in areas which were well established but not traditional areas. Where the actual planted area was greater than the MGA for these areas, the level of payment was reduced proportionately. In the areas receiving special aid a further requirement was that certified seed be used in order to ensure that the quality of production matched industry requirements.

2.2.3 Agenda 2000

Agenda 2000, the next major round of reforms within the COP sector, took effect from 2000/01[6]. This built upon the MacSharry reform with further reductions in cereal intervention prices (by 2001/02 the intervention price had fallen to €101.31 per tonne). This time the basic amounts paid per tonne of cereals were not increased by the same amount as the fall in intervention prices. The basic amount paid per tonne at the reference cereal yield was €58.67 in 2000/01 and €63.00 from 2001/02.

The durum wheat supplementary payment and the special aid were maintained at €344.5 per hectare and €138.9 per hectare, respectively.

2.2.4 Mid-term review (2003)

The single payment scheme

The 2003 reform[7], which is the focus of this evaluation, took the decoupling of payments to producers of COP crops much further, the main aims being to:

- allow farmers freedom to produce to market demand;
- promote environmentally and economically sustainable farming;
- simplify CAP application for farmers and administrators;

[2] Council Regulation (EC) No 1765/92 of 30 June 1992 (OJ L 181, 01.07.1992 p. 12-20)

[3] The basic amount was set at 25ECU per tonne in 1993/94 rising to 45ECU per tonne in 1995/96

[4] This regional yield excluded maize yields in regions with separate reference yields for maize.

[5] Council Regulation (EC) No 2309/97 of 17 November 1997 (OJ L 321 22.11.1997 p. 3 - 6)

[6] Council Regulation (EC) No 1251/1999 of 17 May 1999 (OJ L 160 26.06.1999 p. 1) set the regulatory framework for the arable crop sector until 2003/04.

[7] Council Regulation (EC) No 1782/2003 of 29 September 2003 (OJ L270, 21.10.2003 p.1-69)

- strengthen the EU's position in WTO agricultural trade negotiations.

For durum wheat a further objective of the reform was outlined in Recital n° 35 of the 2003 regulation. This identified the objective of the support *being the maintenance of the role of durum wheat production in traditional production areas while strengthening the granting of the aid to durum wheat respecting certain minimum quality requirements*.

Under the reform, a Single Payment Scheme (SPS) was introduced in the EU-15. The SPS took direct aids from a number of sectors and placed them into a single farm payment. Area payments on cereals, the durum wheat supplement for traditional areas and the durum wheat special aid for non-traditional farms were included within the SPS, although the individual MS could opt to retain, outside of the SPS, up to:

(i) 25% of their coupled payments on COP crops, as France and Spain did, or

(ii) 40% of the durum wheat supplement. No country adopted this option.

Recipients of the SPS had to satisfy cross-compliance conditions in order to receive the aid. These conditions concerned various agricultural and environmental standards[8]. MS were also required to introduce modulation to fund the second pillar of rural development measures.

Under Article 69 of the reform, the MS could grant specific payments to certain types of farming, outside of the SPS, either to protect or enhance the environment or to improve quality and marketing. This provision was used in Greece and Italy, which opted for full decoupling, to encourage an improvement of quality, with aids of up to a maximum of €120 per hectare and €180 per hectare, respectively. The aid was paid on the use of eligible seed varieties.

In order to improve the quality of durum wheat, a specific quality premium of €40 per hectare in traditional areas was payable, subject to the use of a certain quantity of certified seed varieties that would ensure the production of high quality pasta or semolina[9]. For this aid, the MGA in traditional areas was maintained; hence where the planted area was greater than the MGA, the quality premium is reduced proportionately.

Intervention measures

Intervention prices remained unchanged at €101.31 per tonne and the system of export refunds for Annex 1 and Non-annex 1 products (pasta) was maintained.

2.2.5 New member states

With EU enlargement, the 12 new Member States were permitted to opt for either a simplified Single Area Payment Scheme (SAPS), which decoupled all area payments, or the SPS. The majority; 10 of the 12 (the exceptions were Malta and Slovenia) opted for the SAPS [10,11,12].

[8] Among cross-compliance conditions were some related to agronomy, such as land use and crop rotation.

[9] Commission Regulation (EC) No 2237/2003 of 23 December 2003 (OJ L339, 24.12.2003 p. 52-69) clarified the issues regarding the selection of eligible varieties and the quantity of seed to be used.

[10] Council Regulation (EC) No 583/2004 of 22 March 2004 *(OJ L91, 30.03.2004 p. 1-14)* laid down rules for the adaptation of the SPS system to the ten new Member States.

[11] Council Regulation (EC) No 864/2004 of 29 April 2004 *(OJ L161, 30.04.2004 p. 48-96)* defined the national ceilings on payments in the new Member States from 2005 to 2013.

The 12 new MS were also allowed to make Complementary National Direct Payments (CNDP), on a coupled or decoupled basis, for specific crops, within national budgetary envelopes. Initially, during the first three years following accession, it was possible to transfer 20% of amounts from rural development to direct payments. Where the CNDP covered arable crops, durum wheat could be included. In Bulgaria, for instance durum wheat can receive the CNDP.

2.2.6 The current CAP measures

Table 2.2 summarises the SPS schemes in operation in the countries that produce durum wheat and their adoption dates. Within the EU-15, all countries, with the exceptions of the UK and Germany, adopted the historical model for the SPS.

Table 2.2: Durum wheat member states' choices of schemes for decoupled payments from 2005

Member State/Region	Start Date (for SPS)	Model (SPS or SAPS)	Durum Wheat Premium	Coupled Payments on Arable Crops	Coupled Payments on Durum Wheat Supplement	Article 69 (max aid)
Bulgaria		SAPS	No			
Cyprus		SAPS	No			
Czech Republic		SAPS	No			
Germany	2005	SPS dynamic hybrid	No			
Greece	2006	SPS historical	Yes			€120 per ha
Spain	2006	SPS historical	Yes	25%	25%	
France	2006	SPS historical	Yes	25%	25%	
Italy	2005	SPS historical	Yes			€180 per ha
Hungary		SAPS	No			
Austria	2005	SPS historical	Yes			
Portugal	2005	SPS historical	Yes			
Romania		SAPS	No			
Slovakia		SAPS	No			
UK - England	2005	SPS dynamic hybrid	No			

Note: SPS Historical. SPS reference amounts are based on individual farmer payments over the 2000-02 reference period
SPS dynamic hybrid. SPS evolves over time from the historical model towards a regional model where reference amounts are calculated at regional level as opposed to farm level.

Source: DG Agri

Table 2.3 shows the maximum guaranteed areas on which the quality premium is payable. The premium is only payable in traditional areas in countries that have adopted the SPS. Table 2.4 shows the list of traditional areas. The logical diagram (Diagram 2.1) summarises the measures affecting the durum wheat sector following the 2003 reform.

Table 2.3: Maximum guaranteed area

	hectares
Bulgaria	21,800
Greece	617,000
Spain	594,000
France	208,000
Italy	1,646,000

[12] Council Regulation (EC) No 2012/2006 of 19 December 2006 *(OJ L384, 29.12.2006 p. 8-12)* allowed SAPS to continue in new Member States until the end of 2010. For the ten new Member States, their exemption from cross-compliance requirements was ended in 2008; but for Bulgaria and Romania, an exemption applied until 2011.

Austria	7,000
Portugal	118,000
Hungary	2,500
Cyprus	6,183

Table 2.4: Traditional areas

Greece	Spain	Italy	Austria	France	Portugal	Bulgaria
Prefectures of	**Provinces**	**Regions**	**Pannonia**	**Regions**	**Districts**	**Regions**
Central Greece	Almería	Abruzzo	**1. District Farmers' Boards**	Midi-Pyrénées	Santarém	Starozagorski
Peloponnese	Badajoz	Basilicata	2046 Tullnerfeld-Klosterneuburg	Provence-Alpes-Côte d'Azur	Lisbon	Haskovski
Ionian Islands	Burgos	Calabria	2054 Baden	Languedoc-Roussillon	Setúbal	Slivenski
Thessaly	Cádiz	Campania	2062 Bruck/Leitha-Schwechat	**Departments**	Portalegre	Yambolski
Macedonia	Córdoba	Latium	2089 Baden	Ardèche	Évora	Burgaski
Aegean Islands	Granada	Marches	2101 Gänserndorf	Drôme	Beja	Dobrichki
Thrace	Huelva	Molise	2241 Hollabrunn		Faro	Plovdivski
	Jaén	Umbria	2275 Tullnerfeld-Klosterneuburg			
	Màlaga	Apulia	2305 Korneuburg			
	Navarra	Sardinia	2321 Mistelbach			
	Salamanca	Sicily	2330 Krems/Donau			
	Sevilla	Tuscany	2364 Gänserndorf			
	Toledo		2399 Mistelbach			
	Zamora		2402 Mödling			
	Zaragoza		2470 Mistelbach			
			2500 Hollabrunn			
			2518 Hollabrunn			
			2551 Bruck/Leitha-Schwechat			
			2577 Korneuburg			
			2585 Tullnersfeld-Klosterneuburg			
		.	2623 Wr. Neustadt			
			2631 Mistelbach			
			2658 Gänserndorf			
			2 District Divisions			
			3018 Neusiedl/See			
			3026 Eisenstadt			
			3034 Mattersburg			
			3042 Oberpullendorf			
			3. Chamber of Ag			
		.	1007 Wien			

Note: There are traditional areas in Cyprus and Hungary but in these cases the whole country is covered

2.2.7 Single CMO and the health check

Simplification of the CAP proceeded further in 2007[13] when the individual CMOs were placed in one Common Market Organisation. In addition, obligatory set-aside was set at 0% for 2008.

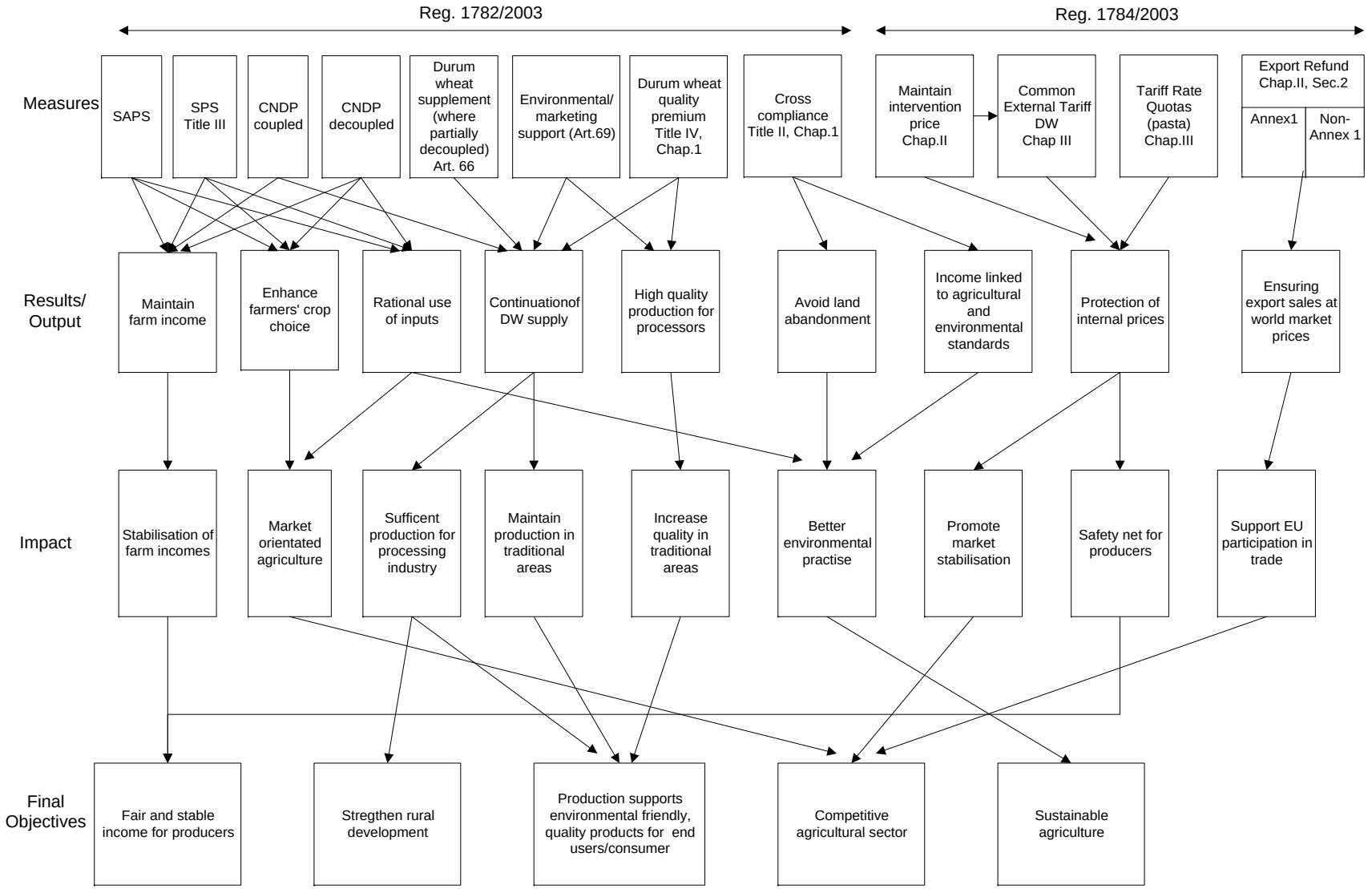
The CAP Health Check[14], which was approved in January 2009, made large strides in the further decoupling of payments. For durum wheat, the quality premium is to be integrated into the SPS in 2010. In addition, the choice by the French and Spanish governments to retain 25% of arable crop direct payments disappears from 2010; however, Article 68 permits Member States

[13] Council Regulation (EC) No 1234/2007 of 22 October 2007 (OJ L299, 16.11.2007 p.1-149)

[14] Regulation (EC) No 73/2009 of 19 January 2009 (OJ L 30, 31.1.2009, p. 16–99)

to elect to make certain coupled payments. Set aside was abolished. Durum wheat was also removed from the intervention measures.

Diagram 2.1: Logical diagram, framework for measures affecting the durum wheat sector



2.3 Other intervening factors

Outside of the EU legislation, other intervening factors that need to be considered include:

2.3.1 Developments in third countries

Changes in both demand and supply in third countries have an impact on the EU policy impacts and objectives. On the supply side, global exports of durum wheat are limited to a small number of countries. The NAFTA region accounts for 75% of global exports and any disruptions to supply reduce the availability of imports to the EU. These disruptions can be caused by disease, adverse weather conditions, etc, which reduce crop size, although they can be influenced by changes in policy.

On the demand side, North Africa is heavily dependent upon imports to meet its durum wheat requirements, with couscous being a staple food. The variability in annual production owing to changing weather conditions means considerable variation in annual import requirements. This then either increases import demand in a year when domestic durum wheat production is low or reduces import demand in years of good crops. In the latter case, this would reduce export demand in the EU's largest export market.

Demand for durum wheat tends to be relatively inelastic given its limited applications and substitution opportunities. This means that relatively small changes in supply can result in large changes in premiums over common wheat.

Global demand for pasta is increasing, which provides an additional outlet for EU production. However, the exports of some dry pasta types from Italy to the US are covered by an antidumping and countervailing duty. The original antidumping and countervailing duty investigations on imports of certain pasta from Italy were instituted in May 1995. Following a five year review in 2007, the US International Trade Commission determined that revocation of the antidumping and countervailing duty orders would be likely to lead to continuation or recurrence of material injury to the United States industry and hence duties were maintained.

Rules of origin in bilateral agreements on cereals permit countries with zero duty access to the EU to import durum wheat at world prices and process it into pasta for sale to the EU. For instance, Tunisia has sought to use EU durum wheat to process and export pasta to the EU with preferential access (This is permitted under "accumulation"). Among bilateral agreements on pasta, Euromed has lower tariffs. Turkey for example has a zero rate TRQ. While this could place pressure on the EU processing industry, at present imports are not significant.

2.3.2 Technical developments

Technical developments in pasta production can alter the global supply demand balance by altering the demand for durum wheat. While demand for pasta is growing modestly, a proportion is made from common wheat rather than durum wheat. This is particularly true of fresh pasta. New production technology, such as high temperature drying, and adding gluten has improved the quality of pasta that can be made from common wheat encouraging substitution. This becomes more advantageous as price differentials between soft wheat and durum wheat widen.

Within the EU, in a number of markets the definition of pasta is enshrined in the national legislation. Typically under these regulations pasta is defined as a product containing durum wheat, but in most cases soft wheat also permitted. In France, pasta can only be defined as pasta if it is produced from durum wheat, although pasta products containing soft wheat can

be imported from other EU markets. There is legislation in Austria, Belgium, France, Germany, Greece, Italy, Netherlands, Portugal and Spain.

Chapter 3: Overview of the Durum Wheat Sector

3.1 Background

This chapter provides the context for the evaluation

- First, it describes key trends in the international market;
- Second, it describes trends within the EU-27;
- Third, it discusses the structure of EU production in greater detail;
- Fourth, it explores the EU processing industry, its size and composition and
- Finally, it highlights price trends over the period of the evaluation.

3.2 The global market

3.2.1 Production

Global durum wheat production averaged 37.9 million tonnes per annum over the last five years, with production peaking in 2004. Over the last five years, production has fallen by on average 1.5% per annum. The EU-27 accounts for 26% of global production (Table 3.1).

Table 3.1: Global production ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU-27	**10,093**	**8,941**	**10,224**	**8,832**	**12,628**	**9,369**	**9,365**	**8,521**	**10,156**
Central and Eastern Europe	**3,439**	**4,259**	**4,454**	**4,155**	**4,555**	**4,735**	**4,912**	**5,395**	**6,052**
Central Europe	89	109	104	55	55	55	55	55	37
Azerbaijan					300	280	507	540	515
Kazakhstan	2,200	2,500	2,600	2,600	2,200	2,400	2,600	3,000	2,600
Russia	1,000	1,400	1,400	1,200	1,500	1,500	1,350	1,400	2,200
Ukraine	150	250	250	200	400	400	300	300	600
Uzbekistan			100	100	100	100	100	100	100
NAFTA	**9,747**	**6,307**	**7,137**	**7,820**	**8,512**	**10,006**	**6,682**	**7,432**	**9,629**
Canada	5,647	2,987	3,877	4,280	4,962	5,915	3,346	3,681	5,519
Mexico	1,100	1,050	1,100	900	1,100	1,339	1,881	1,800	1,800
USA	3,000	2,270	2,160	2,640	2,450	2,752	1,455	1,951	2,310
South America	**250**	**250**	**220**	**250**	**270**	**265**	**303**	**250**	**235**
Argentina	190	200	170	200	200	200	250	200	180
Chile	60	50	50	50	70	65	53	50	55
Middle East	**5,300**	**7,000**	**7,000**	**7,400**	**6,400**	**6,400**	**5,950**	**5,400**	**4,760**
Iran	50	500	700	800	300	300	300	300	200
Iraq	100	200	400	300	100	100	150	150	60
Saudi Arabia	50	200	100	100	300	300	500	450	300
Syria	2,100	3,100	2,800	3,000	2,500	2,500	2,000	1,800	1,200
Turkey	3,000	3,000	3,000	3,200	3,200	3,200	3,000	2,700	3,000
Yemen Rep. of		50	50	50	50	50	50	50	50
India sub-continent	**2,600**	**2,250**	**2,800**	**1,680**	**1,900**	**1,650**	**1,750**	**1,800**	**1,750**
Afghanistan	200	250	450	600	400	350	350	350	350
India	2,000	1,800	2,100	800	1,200	1,000	1,100	1,100	1,100
Pakistan	400	200	250	280	300	300	300	350	300
China	**500**	**500**	**1,000**	**1,000**	**1,000**	**1,100**	**1,300**	**1,300**	**1,400**
North Africa	**1,789**	**3,372**	**2,522**	**5,376**	**5,643**	**4,020**	**5,139**	**3,940**	**3,805**
Algeria	486	1,238	950	1,810	2,002	1,569	1,773	1,806	935
Egypt	70	70	70	100	120	120	120	120	120
Libya	100	90	100	100	100	100	100	100	100
Morocco	427	1,039	1,032	1,766	2,025	941	2,096	514	1,200
Tunisia	706	935	370	1,600	1,396	1,290	1,050	1,400	1,450
Sub-Saharan Africa	**400**	**400**	**200**	**300**	**350**	**350**	**350**	**350**	**350**
Oceania	**300**	**500**	**250**	**600**	**500**	**600**	**200**	**300**	**500**
World	**34,418**	**33,779**	**35,807**	**37,413**	**41,758**	**38,495**	**35,951**	**34,688**	**38,637**

Source: Eurostat, International Grains Council

- EU production is dominated by Italy, Spain, Greece and France, who account of 96% of the total EU durum wheat area. With higher prices, EU production rose to over 10.1 million tonnes, the highest level of production since 2004.

The other major producing regions are NAFTA, Eastern Europe and North Africa.

- US production is concentrated in North Dakota and Montana. US production is shifting westward due to disease problems in eastern North Dakota. Production reached 2.3 million tonnes in 2008; the highest in three years. The average durum wheat farm in North Dakota is in the order of 250 hectares. Under the 2008 Farm Act, support in the form of direct payments and counter-cyclical payments based on historical production. No commodity production is required to receive payments, but the land must be kept in agricultural use (which includes fallow). Participants must comply with certain conservation and wetland provisions.

- With higher prices, Canadian production reached a three year high of 5.5 million tonnes in 2008. Canadian production is solely marketed by the Canadian Wheat Board who has a monopoly on the marketing of Praire wheat. Durum wheat is grown exclusively in the western Prairie region of Canada, and primarily in the province of Saskatchewan. Average farm sizes are high, in the order of 500 hectares, which allows for the production of large quantities of consistent quality durum wheat.

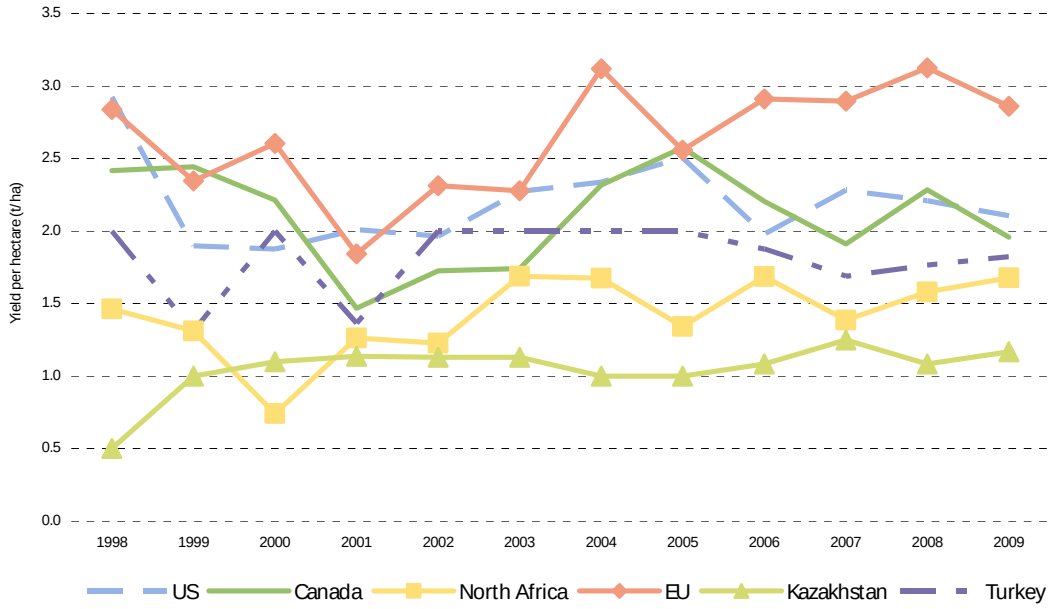
- In Kazakhstan, production is in the order of 2.6 million tonnes per annum. The structure of production has changed significantly since 2000 when the major grain trading companies started to take over the management of cooperatives and smallholdings. These had been created with the break up of the state farms following the collapse of the Soviet Union. Ownership of the land did not transfer from the leaseholders (i.e., the former farm workers), but the companies were able to provide operating capital and inputs, management and business expertise and a market outlet for the grain produced by the newly-formed enterprises. This has led to an improvement in the quality of production. Since 2000, the government has also subsidised inputs.

- North African production is largely dependent on winter rains, which are often unpredictable. As a result, durum production varies considerably between years. With poor rains, production in 2002 fell to 2.5 million tonnes. In 2008, production reached 3.8 million tonnes.

3.2.2 Area and yields

The global durum wheat area is in the order of 18 million hectares in 2008. This area has fallen by close to 1 million hectares since 2003. In terms of area, the EU accounts for 14% of the global area. This is less that the EU proportion of production suggesting that average yields are higher in the EU than those elsewhere in the world. This is confirmed by Diagram 3.1 which compares yields for the major producing countries. Average yields in the EU are the highest at close 3 tonnes per hectare, while yields in the US and Canada are around 2 tonnes per hectare. Yields are lowest in Eastern Europe and North Africa (at between 1 and 1.5 tonnes per hectare).

Diagram 3.1: Selected country average yields



Source: Eurostat, International Grains Council

3.2.3 Trade flows

Global exports peaked at 7.9 million tonnes in 2006/07, with extra EU-27 exports accounting for 15% of the total (Diagram 3.2). Exports are dominated by the NAFTA region. The region accounts for close to 75% of global exports. Canada is the largest exporter.

Extra EU-27 imports accounted for 22% of trade in 2006/07. Extra EU-27 imports peaked at 32% of global trade in 2003/04 (Diagram 3.2). The four North African countries of Algeria, Morocco, Tunisia, and Libya are the largest durum wheat importing countries. North African imports account for close to 40% of global imports.

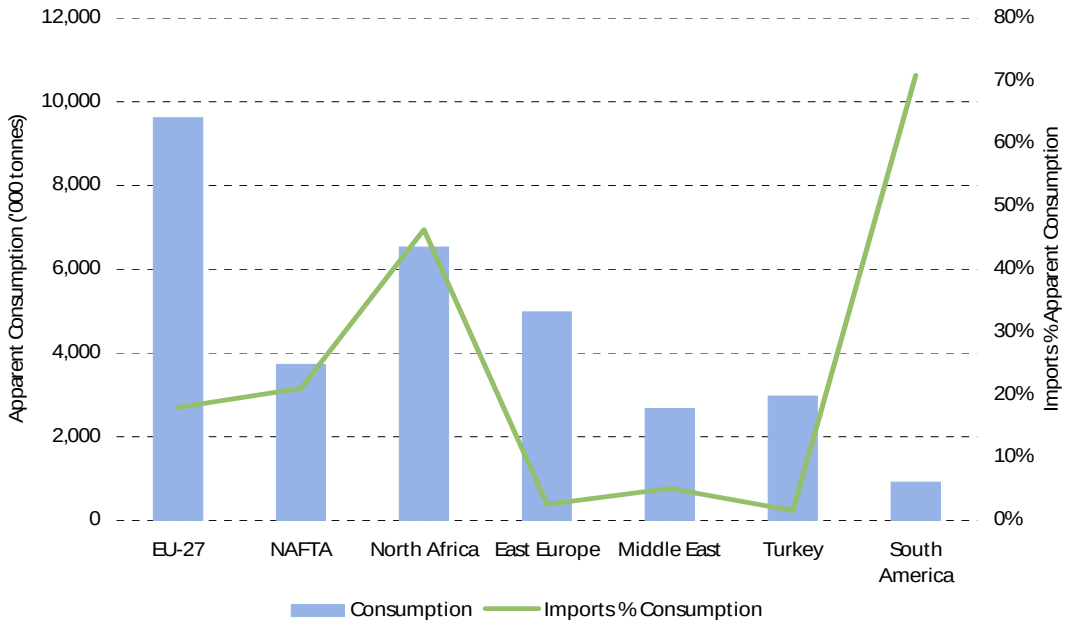
Diagram 3.2: Global trade flows

Source : Eurostat, International Grains Council

3.2.4 Apparent consumption

Combining production with net import data allows us to determine apparent consumption. Diagram 3.3 shows apparent consumption averaged over the period 2004-2008 for the major consuming regions and the dependence of each region upon imports to meet its demand requirement. Apparent consumption is highest in the EU-27 at close to 10 million tonnes, followed by North Africa (6.0 million tonnes). In terms of the need for imports to meet apparent consumption, dependence is greatest in South America and North Africa.

Diagram 3.3: Apparent consumption and dependence upon Imports



Source: International Grains Council, LMC

3.3 Overview of the EU durum wheat sector

3.3.1 Area, production and yields

The area under durum wheat in the EU-27 grew steadily between 1992/93 and 2003/04, peaking at around 4.1 million hectares. Since then, the area has fallen significantly, declining to around 3.0 million hectares in 2006/07. In the last year of the evaluation period, area rebounded to around 3.1 million hectares (Table 3.2). Over the last three years, the share of total cereal area under durum wheat has been around 5% in the EU-27.

By country, the area is dominated by Italy, France, Greece and Spain. Between 2000/01 and 2007/08, these countries accounted for 96% of the total durum wheat area.

- The changes in durum wheat area in Greece, Spain and Italy followed a broadly similar pattern. In these countries, the area grew fairly steadily since 1992/93, reaching its maximum in 2003/04. This was followed by a sharp decline in the following couple of years.
- France has witnessed a steady expansion and virtually doubling of the crop area over the period 1992/93-2007/08.

Table 3.2: EU-27 Durum Wheat Area by Country ('000 ha)

	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Bulgaria	15	23	21	23	22	18	0	6	8
Germany	9	5	5	7	8	10	12	8	7
Greece	669	699	713	704	719	719	633	568	580
Spain	868	885	926	913	949	910	614	496	529
France	338	306	336	353	407	423	454	456	436
Italy	1,663	1,664	1,733	1,689	1,772	1,520	1,343	1,437	1,577
Cyprus	6	5	6	7	8	5	7	5	5
Hungary	15	14	11	11	12	9	10	8	9
Austria	16	12	13	17	18	16	16	15	18
Portugal	139	134	188	144	152	2	3	1	2
Romania	2	3	3	1	4	4	4	2	2
Slovakia	4	9	3	5	7	5	4	4	8
United Kingdom	1	1	2	4	2	2	2	0	0
EU 27	**3,744**	**3,759**	**3,960**	**3,878**	**4,079**	**3,644**	**3,100**	**3,005**	**3,180**

Source: Eurostat

Table 3.3 presents the evolution of durum wheat production over the review period. After peaking at around 12.6 million tonnes in 2003/04, production of durum wheat has fallen and averaged around 9.1 million tonnes over the last three years. Italy accounts for around 50% of total EU production. France is the second largest producer, followed by Spain and Greece with similar shares.

Table 3.3: EU-27 Durum Wheat Production by Country ('000 tonnes)

	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Bulgaria	40.4	62.5	56.7	44.5	70.1	78.1	-	14.0	-
Germany	43.4	23.8	25.8	34.7	50.1	50.8	62.0	38.0	38.8
Greece	1,783.8	1,721.2	1,635.4	1,375.0	1,724.0	1,676.7	1,402.2	1,217.9	1,593.9
Spain	1,939.2	1,899.5	2,153.2	1,989.2	2,707.8	934.5	1,643.2	1,227.1	1,145.5
France	1,685.0	1,351.6	1,613.7	1,427.3	2,085.6	2,042.2	2,099.8	1,990.9	2,126.1
Italy	4,310.3	3,624.0	4,267.8	3,717.5	5,545.7	4,431.0	3,988.7	3,922.7	5,066.7
Cyprus	10.0	10.5	12.9	14.3	9.9	9.2	7.3	10.7	10.2
Hungary	44.5	49.1	42.6	23.8	54.0	39.0	39.8	29.2	36.1
Austria	43.7	46.1	49.5	63.8	88.6	62.7	76.6	53.2	91.3
Portugal	172.5	102.7	327.2	113.4	234.6	1.2	7.5	2.5	3.5
Romania	3.8	9.7	8.4	1.6	14.4	10.2	8.4	1.3	7.0
Slovakia	10.7	33.9	12.4	12.6	32.0	21.8	17.9	13.5	37.1
United Kingdom	6.0	6.0	18.7	14.0	11.6	12.0	12.0	-	-
Total	10,093.3	8,940.6	10,224.3	8,831.7	12,628.4	9,369.4	9,365.4	8,521.0	10,156.2

Source: Eurostat

Yields tend to fluctuate significantly from year to year depending upon rainfall levels. This is particularly evident in Spain, where drought conditions over summer have meant that yields have fallen to as little as one tonne per hectare in 2004/05. Table 3.4 highlights trends in yields.

Portugal has the lowest yields, at between 1.0 and 2.0 tonnes per hectare. Across the four case study MS, yields are also quite low in Greece, Spain and Italy. Here, yields have improved in recent years. France has by far the highest yields, at between 4 and 5 tonnes per hectare.

Table 3.4: EU-27 durum wheat yield by country (kg/hectare)

	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Bulgaria	2,675	2,778	2,700	1,918	3,186	4,268		2,500	
Germany	5,047	5,064	5,375	4,753	6,110	4,932	5,299	5,000	5,969
Greece	2,651	2,263	2,152	1,891	2,297	2,249	2,697	2,787	3,299
Spain	2,236	2,146	2,325	2,178	2,854	1,026	2,676	2,968	2,167
France	4,987	4,411	4,810	4,047	5,128	4,832	4,638	4,368	4,958
Italy	2,592	2,178	2,462	2,201	3,129	2,915	2,970	2,726	3,320
Cyprus	1,613	1,944	2,186	1,986	1,320	1,736	1,123	2,019	2,040
Hungary	3,007	3,558	3,944	2,144	4,500	4,333	4,103	3,696	4,247
Austria	2,783	3,842	3,929	3,820	5,006	4,045	4,818	3,455	5,101
Portugal	1,242	769	1,738	786	1,543	571	2,273	1,786	2,333
Romania	1,652	3,129	2,800	1,231	3,600	2,833	2,333	765	2,917
Slovakia	2,610	3,725	3,875	2,520	4,571	4,192	4,366	3,857	4,638
United Kingdom	6,000	6,000	8,130	4,000	6,824	6,000	6,000		
Total	2,693	2,340	2,552	2,264	3,073	2,553	3,136	3,050	3,358

Source: Eurostat

3.3.2 Traditional areas

The durum wheat area can be split between traditional and non-traditional zones. These areas are defined in the regulations[15]. In France, over the review period, the traditional area averaged 70% of the total area, in Italy it averaged 97%, in Greece, 99% and Spain and Portugal close to 100%.

Traditional production zones account for around 95% of total durum wheat area and for 90% of total durum wheat output. For traditional areas, the area has declined since 2000/01, while for non-traditional areas, the area has increased (Table 3.5).

Table 3.5: Area, production and yield in traditional and non traditional zones

	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Area ('000 hectares)									
Traditional zones	3,551	3,627	3,787	3,722	3,874	3,407	2,837	2,726	2,874
Non-trad	193	132	173	156	205	237	263	279	306
Production ('000 tonnes)									
Traditional zones	9,203	8,259	9,492	8,079	11,517	8,326	8,015	7,191	7,972
Non-trad	891	682	732	753	1,111	1,043	1,350	1,330	2,185
Yield (t/ha)									
Traditional zones	2.6	2.3	2.5	2.2	3.0	2.4	2.8	2.6	2.8
Non-trad	4.6	5.1	4.2	4.8	5.4	4.4	5.1	4.8	7.1

Source: LMC based on Eurostat regional data

3.3.3 Importance of durum wheat to total agricultural output

In terms of value, over the review period, durum wheat output averaged €5,000 million per year. This equates to 1% of total agricultural output. At a regional level, the contribution of

[15] Chapter 2, Table 2.4 shows the designated traditional areas

durum wheat production to the total agricultural output in traditional production zones[16] averaged 4.5% (Table 3.6).

Table 3.6: Value of total agricultural output and durum wheat production in traditional production zones, 1999/00-2005/06 (million euros)

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Total agricultural output	40,745	40,681	42,021	42,870	40,011	38,765
Durum wheat	2,082	2,038	1,879	2,181	1,568	1,203
Durum wheat share	5.1%	5.0%	4.5%	5.1%	3.9%	3.1%

Source: LMC calculations based on Eurostat data
Note: Does not include data for Spain and Portugal

3.3.4 EU-27 trade flows

Imports

The EU-27 imported 1.3 million tonnes of durum wheat in 2008, compared with around 1.9 in the previous year. Over the last five years, imports have averaged 1.8 million tonnes per annum (Table 3.7). Imports are dominated by North America, with Canada alone accounting for 34% of imports in 2008.

Table 3.7: Durum wheat imports by country ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Kazakhstan	0	4	7	4	10	40	17	105	209
Eastern Europe	4	4	5	4	9	26	24	35	28
Syria	-	0	92	52	79	71	167	200	1
Turkey	271	176	10	26	1	91	202	13	0
Canada	228	340	174	1,107	1,081	932	926	880	444
Mexico	-	-	-	-	-	-	151	182	234
USA	443	648	455	375	218	375	298	480	342
Australia	359	217	338	94	340	248	249	8	45
Other	1	27	16	61	44	11	7	41	39
Total	**1,307**	**1,415**	**1,098**	**1,723**	**1,783**	**1,795**	**2,041**	**1,944**	**1,342**

Source: Eurostat

In comparison, imports of durum wheat flour (semolina) are small, averaging 5,000 tonnes over the last five years (6,900 tonnes in grain equivalent terms) (Table 3.8).

Table 3.8: Durum wheat flour imports (tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Durum wheat flour	22,572	7,559	2,748	1,554	6,678	3,475	4,372	5,461	4,869

Source: Eurostat

[16] Traditional production zones are listed in Council Regulation No 1782/2003. A comprehensive list of the regions included in these zones was presented in Table 2.4.

Imports of pasta products have more than doubled since 2000, reaching 180,000 tonnes in 2008. The most important imported pasta products are prepared dried pasta. China is the most important importer accounting for close to 50% of dried pasta imports (Table 3.9). The MFN duty on pasta is 7.5% ad valorem + €211 per tonne.

Table 3.9: Pasta imports by product (tonnes)

Description	HS code	2000	2001	2002	2003	2004	2005	2006	2007	2008
Uncooked Pasta, containing eggs	19021110	10,771	10,423	8,589	7,198	6,843	6,251	6,149	7,050	7,090
Uncooked Pasta	19021910	7,653	7,714	8,884	9,866	12,133	10,444	9,463	11,737	14,094
Uncooked Pasta, containing common wheat	19021990	5,917	6,449	6,721	8,891	9,371	7,818	8,319	7,761	9,202
Pasta stuffed with fish	19022010	397	329	259	411	564	866	1,062	1,354	1,586
Pasta stuffed with meat	19022030	93	68	13	39	92	102	90	252	440
Cooked pasta stuffed with meat	19022091	7,458	8,172	9,849	10,300	11,775	11,442	11,458	12,701	15,666
Pasta otherwise prepared	19022099	1,565	1,177	1,214	1,343	1,888	2,787	2,788	3,581	4,068
Dried pasta, prepared	19023010	35,035	38,257	51,314	54,629	62,908	67,257	74,069	88,274	91,693
Cooked pasta	19023090	10,194	10,883	10,703	10,450	13,535	18,956	21,255	25,491	27,527
Couscous, unprepared	19024010	1,177	1,773	1,727	2,582	3,156	4,122	3,537	4,818	5,516
Couscous, prepared	19024090	239	284	656	862	930	1,177	1,258	1,508	1,286
Total		**80,499**	**85,527**	**99,928**	**106,570**	**123,194**	**131,221**	**139,448**	**164,526**	**178,169**

Source: Eurostat

Exports

Durum wheat exports from the EU-27 peaked at 1.1 million tonnes in 2005 (Table 3.10). North Africa, where couscous is an important staple, accounted for around 90% of exports.

Table 3.10: Durum wheat exports by country ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
N. Africa	243	282	856	680	968	1,061	862	667	895
Eastern Europe	54	22	1	0	0	5	0	4	2
Middle East & Turkey	33	0	23	7	26	0	23	85	119
Western Europe (non-EU)	50	31	51	6	21	43	47	47	33
Other	48	24	19	14	7	13	22	29	11
Total	428	359	949	708	1,022	1,121	954	831	1,060

Source: Eurostat

The export of durum wheat flour is small, averaging just 9,500 tonnes per annum in the period between 2004 and 2008 (Table 3.11).

Table 3.11: Extra EU-27 durum wheat flour exports (tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Durum wheat flour	7,060	6,708	2,693	2,722	5,431	9,472	9,890	9,101	13,607

Source: Eurostat

Pasta product exports are dominated by uncooked pasta (HS19201910). This category alone accounts for around 80% of total pasta exports (Table 3.12).

Table 3.12: Pasta exports by product (tonnes)

Description	HS code	2000	2001	2002	2003	2004	2005	2006	2007	2008
Uncooked Pasta, containing eggs	19021110	15,716	15,058	15,003	15,791	18,441	29,355	19,465	21,025	21,816
Uncooked Pasta	19021910	513,707	553,306	561,124	520,647	519,820	535,534	539,266	543,990	499,768
Uncooked Pasta, containing common wheat	19021990	70,035	70,511	67,510	73,316	67,979	65,560	67,074	62,311	64,008
Pasta stuffed with fish	19022010	122	165	99	84	86	101	204	388	174
Pasta stuffed with meat	19022030	665	1,093	1,028	2,467	2,103	1,415	1,212	1,737	1,189
Cooked pasta stuffed with meat	19022091	3,529	3,268	4,376	4,371	6,742	7,844	11,120	13,001	12,253
Pasta otherwise prepared	19022099	4,653	5,577	8,054	10,945	9,916	10,063	10,826	13,169	12,824
Dried pasta, prepared	19023010	9,198	11,099	10,551	8,892	8,982	8,551	6,851	6,424	6,262
Cooked pasta	19023090	7,313	9,704	9,489	9,429	14,761	24,842	27,324	29,843	29,538
Couscous, unprepared	19024010	5,525	5,843	5,823	5,283	5,239	4,918	5,403	5,967	5,935
Couscous, prepared	19024090	882	1,601	1,362	1,790	2,114	2,545	2,925	3,620	4,317
Total		631,346	677,225	684,420	653,015	656,181	690,727	691,670	701,475	658,084

Source: Eurostat

Net imports

While the EU-27 is a net importer of durum wheat, it is a net exporter of pasta products. This reduces the total level of net imports. Combined, net imports (on a grain equivalent basis) are in the order of 400,000 tonnes per annum, the EU-27 was a net exporter in 2008 (Table 3.13).

Table 3.13: Net imports ('000 tonnes, grain equivalent basis unless otherwise specified)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Durum Wheat									
Imports	1,307	1,415	1,098	1,723	1,783	1,795	2,041	1,944	1,342
Exports	428	359	949	708	1,022	1,121	954	831	1,060
Net	879	1,056	149	1,016	761	674	1,087	1,113	282
Durum Wheat Flour									
Imports (tel quel)	23	8	3	2	7	3	4	5	5
Exports (tel quel)	7	7	3	3	5	9	10	9	14
Net (tel quel)	16	1	0	-1	1	-6	-6	-4	-9
Net	21	1	0	-2	2	-8	-8	-5	-12
Pasta									
Imports	98	105	126	134	155	165	176	209	224
Exports	673	723	731	698	700	734	734	744	699
Net	-575	-618	-606	-564	-544	-568	-557	-535	-475
Net Imports	325	438	-456	451	218	100	524	574	-201

Note: EC Reg 1043/2005 sets out the basic conversion factors for durum wheat flour and pasta to a durum wheat equivalent basis. However, some products are based on actual weight and do not have standard conversions. These have been estimated on the basis of USDA conversion factors.
Source: Eurostat

3.4: Structure of production

3.4.1 Farm size

Within the EU-27, the number of farms growing durum wheat saw an increasing trend to 2004/05, the last year for which data are available (Table 3.14). While all size classes have increased, the largest expansion has taken place in the largest size class (more than 100 hectares).

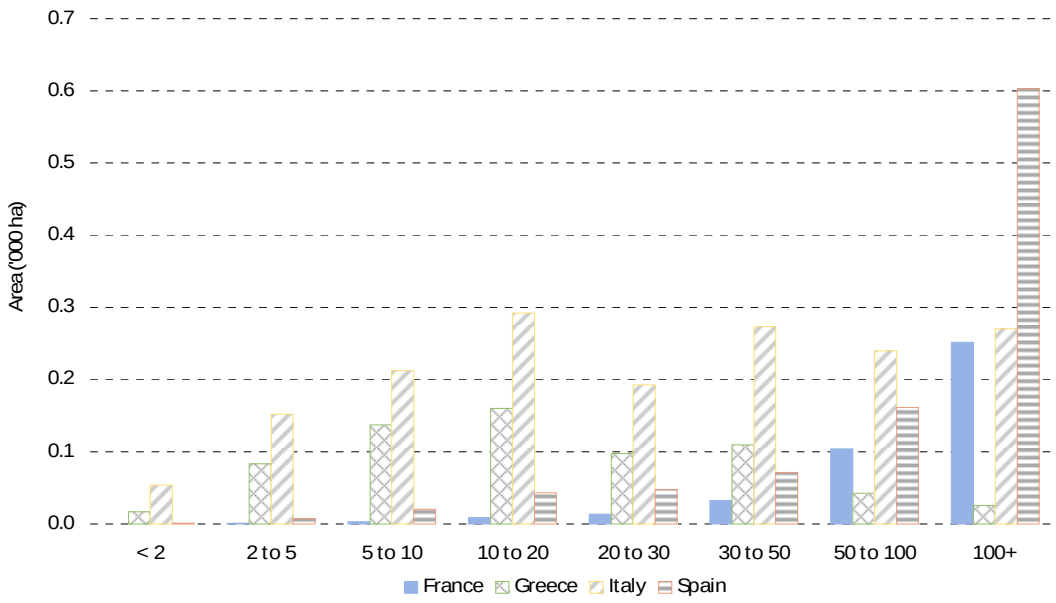
Table 3.14: Durum wheat farms by size class of farms (hectares)

	1989/90	1992/93	1994/95	1996/97	1999/00	2002/03	2004/05
< 2	96,500	64,310	61,130	55,680	71,860	79,420	59,460
2 to 5	309,160	220,990	253,880	245,720	242,450	268,920	254,410
5 to 10	449,480	341,110	331,920	403,040	378,620	400,130	377,690
10 to 20	551,430	459,600	444,880	518,100	499,270	545,140	501,470
20 to 30	282,380	283,710	330,260	316,320	322,110	382,180	317,260
30 to 50	359,280	361,540	409,450	409,120	419,440	508,120	443,960
50 to 100	463,670	433,590	448,110	487,740	447,980	595,110	532,320
100+	648,280	754,910	850,450	939,870	945,220	1,314,090	1,159,810
Total	**3,160,180**	**2,919,760**	**3,130,080**	**3,375,590**	**3,326,950**	**4,093,110**	**3,646,380**

Source: LMC calculations based on Eurostat data

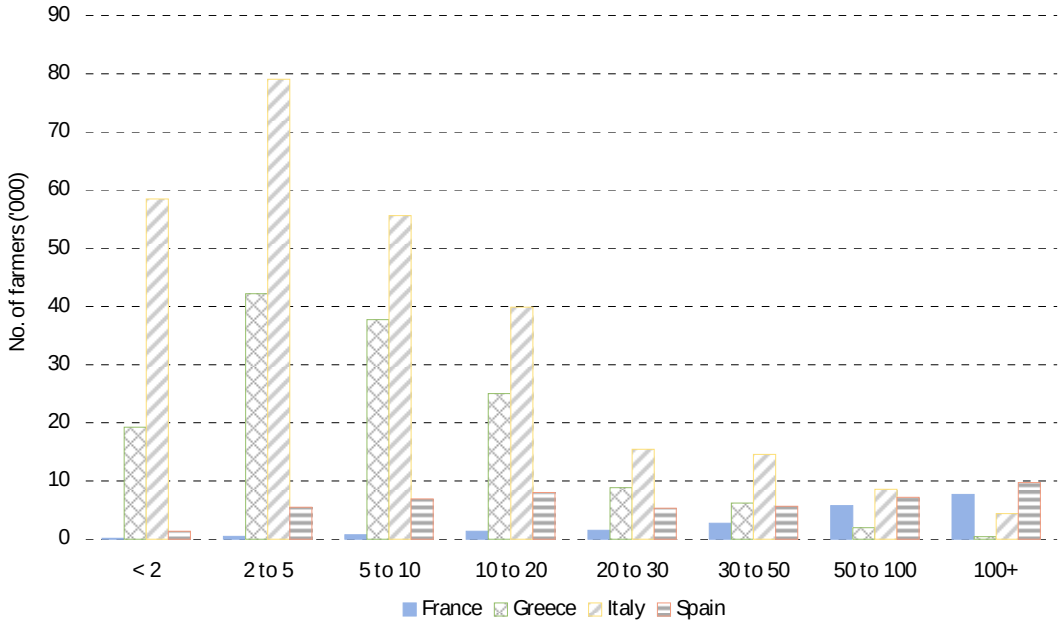
Diagrams 3.4 and 3.5 compare average farm size between MS in terms of area and number of farmers, respectively. In terms of area, in France and Spain this is dominated by large farms of over 50 hectares. In Greece, average farm size peaks between 10 and 20 hectares, while Italian farm sizes are fairly evenly distributed between a size of 5 hectares to over 100 hectares. In terms of the number of farms, in Greece and Italy, the majority of farms are under 20 hectares. In France and Spain, the farm sizes are higher.

Diagram 3.4: Durum wheat farms, by size, area, average 2002/03 to 2006/07



Note for Spain and Greece data are only to 2004/05
Source: Eurostat

Diagram 3.5: Durum wheat farms, by size, number of farms

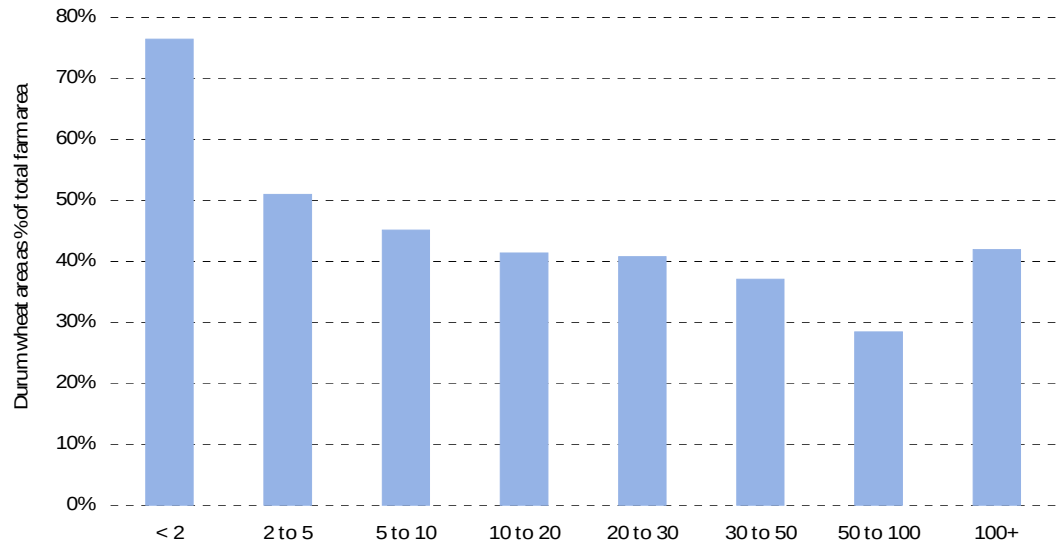


Note for Spain and Greece data are only to 2004/05
Source: Eurostat

3.4.2 Degree of specialisation

Diagram 3.6 describes the degree of specialisation on durum wheat production for the farms that choose to grow it. The degree of specialisation in durum wheat is highest for very small farms (less than 2 hectares). For all other size classes, the level of specialisation in durum wheat production is still quite high (at between 40% and 50%), with the only exception of the 50 to 100 hectare size class.

Diagram 3.6: Durum wheat area as % of total farm area by size class of farm, average 1996/97-2006/07



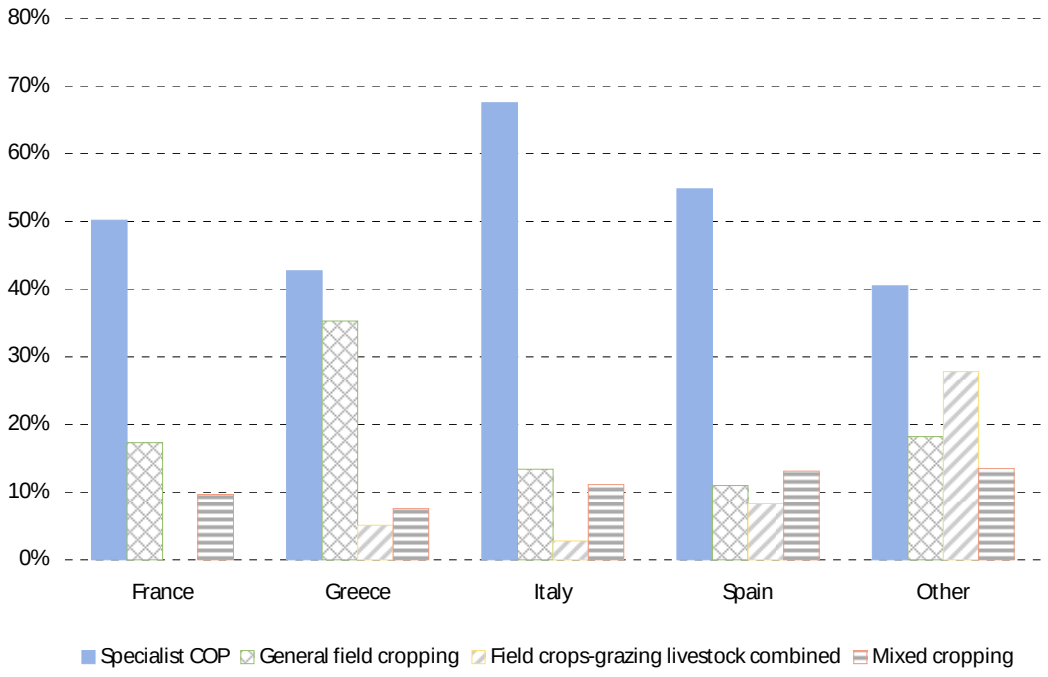
Source: LMC calculations based on Eurostat data

3.4.3 Alternative crops

Based on the FADN sample of durum wheat specialists, Diagram 3.7 reveals the subdivisions of particular type of farming durum wheat specialists belong to:

- COP specialists are the main specialisation for durum wheat farmers in most of the countries. However, its importance varies significantly across the countries, going from just below 70% in Italy to around 45% in Greece.
- General field cropping is the second largest category. This is of particular significance in Greece, where it includes a large number of tobacco specialists. Other specialists in this category include various field crops combined (a combination of cereals, oilseed crops, root crops, field vegetables, tobacco and cotton).
- Other specialists in order of significance are mixed cropping, a combination of field crops and permanent crops (vineyards, citrus and citrus fruit and olive groves), and field crops and grazing livestock combined.

Diagram 3.7: Crops specialisation by country, average 1999/00-2005/06



Source: LMC calculations based on FADN data

3.4.4 Production technology

Crop rotations

The farmers interviewed during the fieldwork grow a fairly large selection of crops in rotation with durum wheat (Table 3.15). These range from mainly fodder crops in *Puglia*, where the dry very dry climate limits significantly the choice of alternative crops, to the main broad acre crops in *France*, *Centre*. In Greece, cotton and maize require irrigation.

Table 3.15: Main crops grown in rotation with durum wheat

France (Centre)	Italy (Puglia)	Greece (Macedonia)	Spain (Andalucia)
wheat	field beans	cotton	sunflower
rapeseed	barley	maize	field beans
sunflower	oats	barley	wheat
barley	wheat	vetch	barley

Source: Farmer Questionnaires

At a country level, interviews with producers' associations confirmed this evidence. The most common rotations employed by interviewed farmers in the case study MS are:

- Western France: sunflower - wheat - durum wheat – maize, sunflower - maize - durum wheat.
- South East France: mostly durum wheat year after year alternated with rapeseed, sunflower or soybeans.
- South France: Rapeseed followed by two years of durum wheat.
- Greece: wheat – clover – wheat or maize, wheat – tare – maize or cotton, wheat – clover – tomato for industrial use
- Spain: durum wheat-sunflower, durum wheat -wheat or triticale or barley - sunflower, fallow or dry pulses - durum wheat - sunflower.
- Italy (Sicily – a traditional production region): durum wheat/cereals for fodder, durum wheat/grain legumes.

Dry/irrigated production

Evidence from the questionnaires revealed that, in general, durum wheat grown under irrigated conditions accounts for a relatively small share of total durum wheat area. However, the extent to which durum wheat is irrigated varies greatly between MS. This is revealed in Table 3.16 which shows the number of questionnaire responses to the irrigated area. In the case of Italy, 100% of respondents reported no irrigation.

Table 3.16: Proportion of durum wheat irrigated area in the four case study MS

Proportion irrigated	0-20%	20-40%	40-60%	60-80%	80-99%	100%
France	50%	0%	25%	0%	0%	25%
Greece	40%	7%	20%	7%	7%	20%
Italy	100%	0%	0%	0%	0%	0%
Spain	50%	33%	0%	0%	0%	17%

Source: Farmer Questionnaire

In Greece, annual water requirements for durum wheat (when needed) are estimated at around 100-150 cubic meters per hectare in the Thessaly region. (This compares with 7,500 cubic meters per hectare for maize and 5,000 cubic meters per hectare for cotton.) Farmers interviewed during the fieldwork in Central Macedonia indicated that this requirement is lower at 60 cubic metres per hectare.

Labour requirements

An indication of labour requirements can be gleaned from the FADN data for durum wheat specialists. As shown in Table 3.17 this ranges from over 100 hours per hectare in Greece to just 30 hours per hectare in France. The questionnaire responses suggest that durum wheat production accounts for 11% of labour use in France, 31% in Greece, 52% in Italy; and 31% in Spain.

Table 3.17: Labour requirements (hours per hectare)

	2000	2001	2002	2003	2004	2005	2006	Average
France	40	35	31	33	27	37	26	33
of which: unpaid	*29*	*29*	*19*	*21*	*21*	*29*	*21*	*24*
Greece	142	132	141	109	104	100	85	116
of which: unpaid	*129*	*121*	*130*	*100*	*93*	*90*	*71*	*105*
Italy	88	75	72	65	65	64	74	72
of which: unpaid	*78*	*67*	*65*	*59*	*58*	*55*	*62*	*63*
Spain	36	45	36	41	36	32	31	37
of which: unpaid	*34*	*43*	*35*	*41*	*35*	*32*	*30*	*36*

Source: FADN

Use of inputs: seed, fertiliser and pesticide levels

- Seed use for durum wheat production average around 200kg per hectare. In Greece, the range is between 200-250 kg per hectare, while data for the in Italian case study region of Puglia is 170-230 kg per hectare.
- In terms of fertiliser use, farmers apply 200 kg per hectare of nitrogen fertiliser. In Puglia farmers also apply around 200 kg per hectare of potassium fertilizer when sowing. For Greece, the number is higher at around 300 kg per hectare, bringing total fertiliser use at around 500 kg per hectare. Greek farmers interviewed during the fieldwork in Central Macedonia indicated that total fertiliser use averages 200-250 kg per hectare. In Spain, nitrogen fertiliser use is around 200-235 kg per hectare.
- Pesticides are not widely used in durum wheat production. When they are applied, the amount used is around 1-2.5 litres per hectare in Puglia and 1.5-2.5 litres per hectare in Greece.
- In Puglia and Spain in some cases, herbicide is used by farmers to control weed. The amount applied ranges between one and three litres per hectare. In Spain, farmers apply between 1 and 3 litres per hectare.

3.5 The processing sector

Table 3.18: Distribution of durum wheat mills in the EU

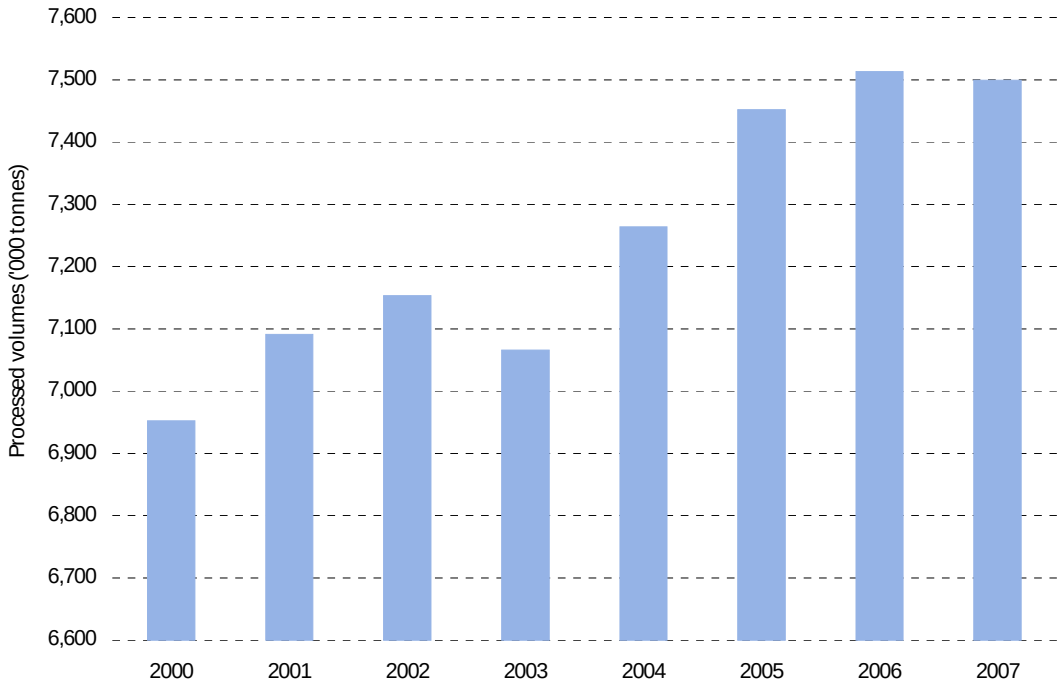
	2000	2001	2002	2003	2004	2005	2006	2007
Italy	187	160	160	181	178	177	177	162
Greece	12	12	12	12	17	17	16	12
Spain	10	10	9	9	9	9	8	8
France	7	7	7	7	7	7	7	7
Austria	4	2	5	5	5	5	5	5
Germany	5	5	5	5	5	5	5	5
Portugal	3	2	2	2	2	2	2	2
UK	2	2	2	2	2	2	2	2
Cyprus								2
Benelux	3	2	2	2	2	2	2	2
Finland		2	2	2	2	2	2	1
Poland					1	1	1	1
Total	233	204	206	227	230	229	227	209

Source: Semouliers

In 2007, the number of durum wheat mills in the EU-27 totalled 209 units. This compares with 233 mills in 2000 (Table 3.18).

According to the Semouliers' Association, the EU industry processes in the order of 7.5 million tonnes per annum. The amount processed has grown at 1% per annum over the 2000/01 to 2007/08 period (Diagram 3.8).

Diagram 3.8: EU-27 processed durum wheat



Source: Semouliers

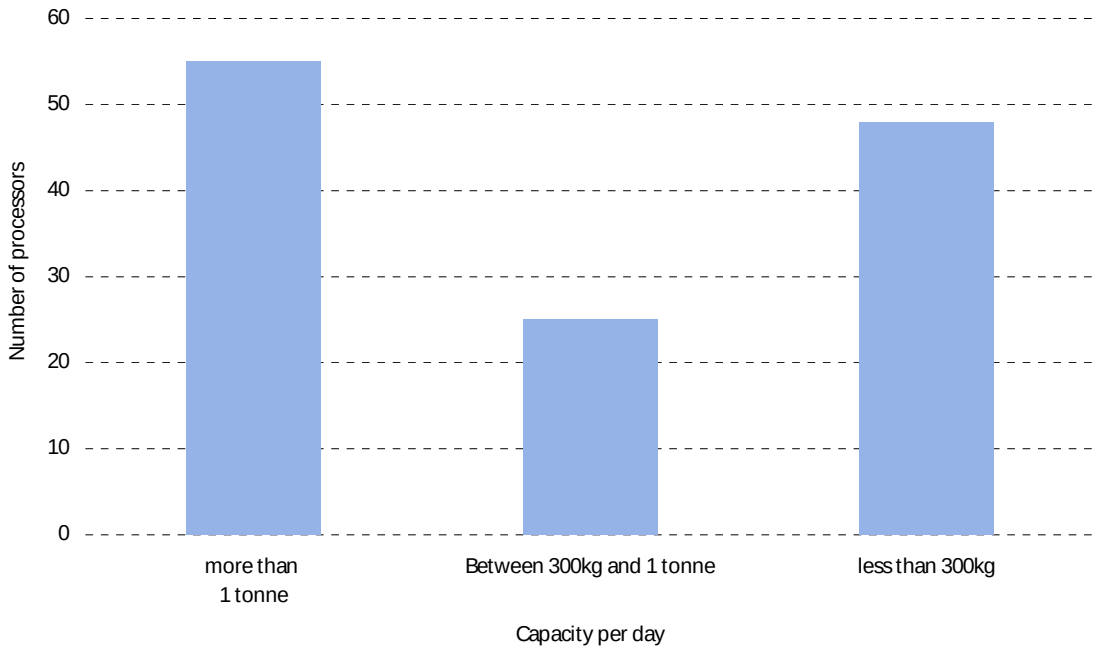
The number of pasta processors in the EU has declined from just below 200 in 2002 to around 180 in 2008. Table 3.19 reveals that the pasta sector is dominated by Italian producers (128 in 2007). There are a large number of smaller firms (Diagram 3.9). This situation partly occurs due to the diversity of consumer demand. There are also large differences between short (fresh) and long (dry) shelf life operators.

Table 3.19: Dry pasta processors in the EU-27

	2002	2003	2004	2005	2006	2007	2008
Italy	132	135	134	130	130	128	128
Germany	20	20	20	20	20	20	20
Spain	12	11	10	8	8	8	8
France	9	7	9	8	8	8	8
UK	8	8	8	8	8	8	8
Greece	7	7	7	6	5	4	4
Austria	4	5	6	2	n.a.	n.a.	n.a.
Benelux	n.a.	2	2	2	2	1	2
Portugal	2	1	1	1	1	1	1
Sweden	1	1	1	1	1	1	1

Source: UNAFPA

Diagram 3.9: Italian processors by daily processing capacity

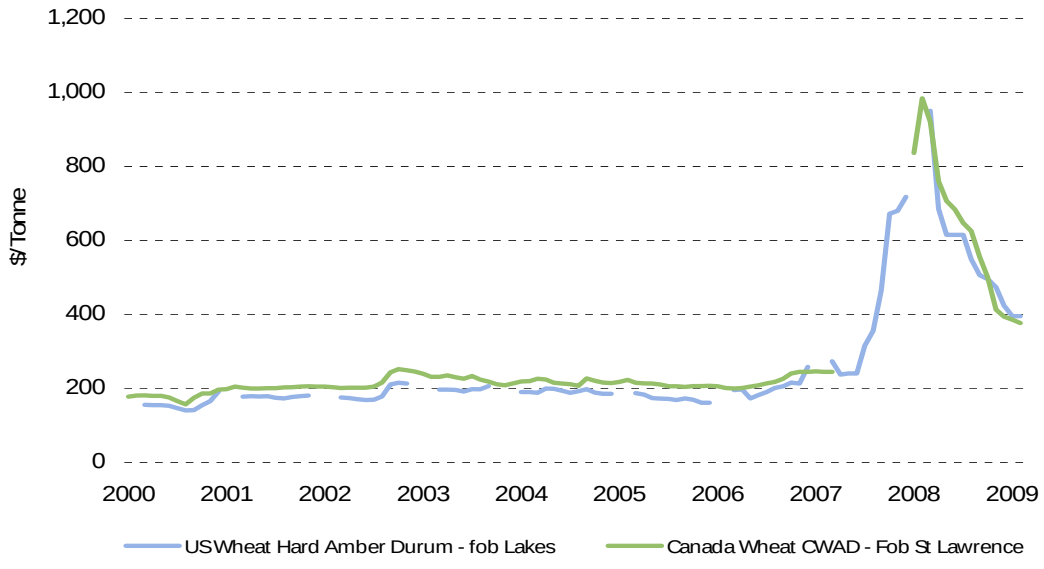


Source: UNAFPA

3.6: Price trends

The limited trade in durum wheat, and the concentration of that trade in only a few countries, mean that there is no internationally recognised quoted "world price". Price series are available for the US and Canada and these give an indication of the underlying level of international prices. The price of durum wheat rose substantially in 2007/08 as underlying cereal prices rose (Diagram 3.10). The differential between durum wheat and common wheat rose to record levels.

Diagram 3.10: Canadian and US wheat hard amber durum

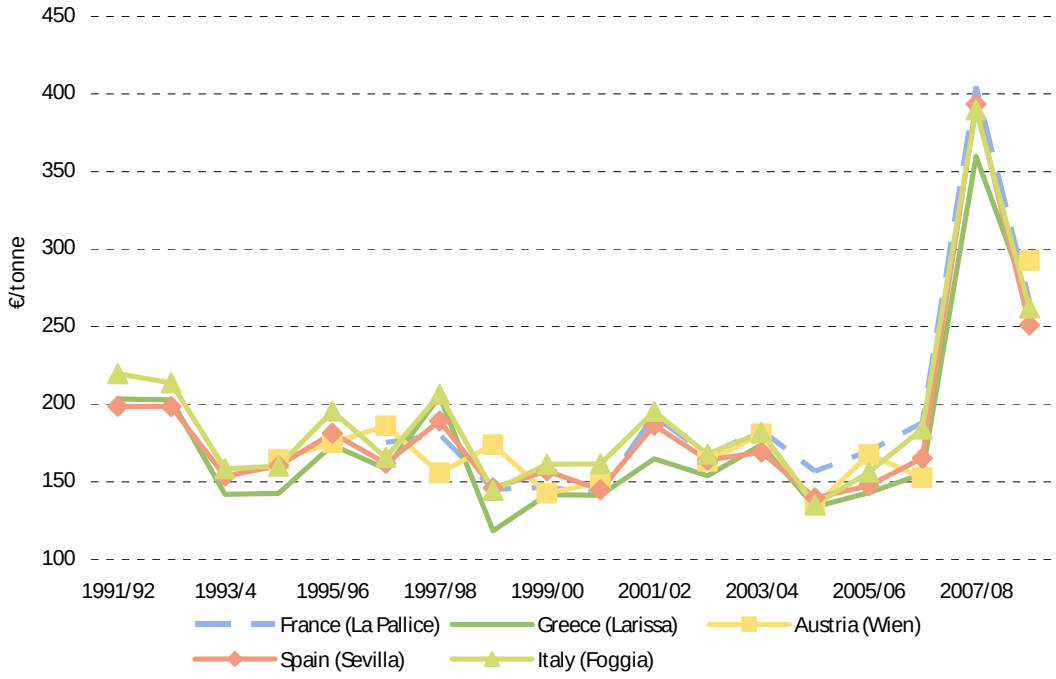


Note: The gaps in the data series are due to the fact that US production is not traded throughout the year due to the long hard winters
Source: US Wheat Associates

Diagram 3.11 charts the evolution of prices in selected EU markets over the period 1991/92-2008/09[17]. It reveals that, in general, prices across the different markets tend to follow a similar trend.

- Durum wheat prices have traded within the range of €150-200 per tonne over most of the period surveyed, although they fluctuated significantly within this range from year to year. The only exception to this is the Larissa price, which, on average, has been the lowest of the selected prices. It reached a minimum in 1998/99, when it traded at around €120 per tonne.
- In most markets, prices reached a minimum in 2004/05, trading at around €140 per tonne. In 2007/08, on the back of high commodity prices witnessed at a global level, they peaked in all markets, reaching historical maxima at around €400 per tonne. Prices were lowest in Larissa at around €360 per tonne.
- Since then, prices have declined, trading at €250-280 per tonne in the first half of the 2008/09 marketing year.

Diagram 3.11: Evolution of durum wheat prices, 1991/92-2007/08



Source: DG Agri

[17] For the 2008/09 marketing year, monthly prices are only available up to January 2009.

Chapter 4: Effects on Primary Production

Q1.1 and Q2.1. To what extent have the CAP measures supporting durum wheat ensured the maintainance of durum wheat production in traditional production areas, led to structural change and changes in the geographical distribution of durum wheat production?

Q1.2. To what extent have the CAP measures supporting durum wheat contributed to the income of producer farmers?

Q1.3. To what extent have the CAP measures increased the quality of durum wheat in traditional areas?

Each question is answered separately and hence judgement criteria are presented at the beginning of each section. Traditional areas are spelt out in the Regulations[18]. These areas are concentrated in four countries, namely Greece, Spain, France and Italy. As areas and production are also increasing in some non-traditional areas we also analyse trends in these regions.

The focus of the analysis is the 2003 Reform. The Reform was implemented at a different time in different countries: in Italy, it was introduced in 2005, while in France, Spain and Greece, it was introduced in 2006. The most important measures affecting production decisions are: the decoupling of aid; the Quality premium in traditional areas; partially decoupled aids (France and Spain); and Aid under Article 69 (Greece and Italy).

In terms of production, it is the effect of the combination of the various measures that is analysed as this is what producers see with the change in gross margins. It is difficult to attribute effects to individual measures. In a counterfactual case, where all coupled support for durum wheat and competing crops is set at zero, we assess the effect of full decoupling.

In addition, changes in gross margins and the area under durum wheat are not just caused by the measures. Market forces, as revealed by the underlying level of prices, also have an impact. This is apparent in the post reform period, when durum wheat prices and input costs rose to very high levels in 2008. Consequently, in analysing gross margins, we divide the post reform period into two periods: 2006-2007 and 2008. During the 2006-2007 period costs and prices were at a similar level to those pre-reform. In 2008, durum wheat prices rose to very high levels and production costs rose strongly.

Evaluation question 1.1 and 2.1: Maintaining production of durum wheat

4.1 The maintenance of production and structural change

The maintenance of production is defined as the average area and production over the between 2000/01 and the introduction of the reform. We assess changes against this. The introduction of the regime was different across the MS.

In analysing structural change, the focus is placed on identifying changes to farm size, specialisation (i.e., the area under durum wheat compared to other crops) and the structure of production (levels of input use, irrigation, etc.)

[18] See Chapter 1 Table 2.4.

Table 4.1: Questions 1.1 and 1.2 judgement criteria, indicators and data sources

Judgement criteria	Indicator	Data Sources	
		Quantitative	Qualitative
Changes in area durum wheat versus alternatives	Durum wheat area versus alternative crop area Durum wheat area, by region	Eurostat/Case studies	Farmers' questionnaire/ Association interviews
Changes in durum wheat production and yields over time by MS	Durum wheat production (trad v non-trad)	Eurostat/Case studies	Farmers' questionnaire/ Association interviews
	Durum wheat yield (trad v non-trad)	Eurostat/Case studies	Farmers' questionnaire/ Association interviews
Relationship between gross margins and planted areas	Changes in gross margins DW versus alternative crops, change in area	FADN/Case studies	Farmers' questionnaire
Changes in size by MS	Changes in farm size	Eurostat/FADN	Case studies
Changes in the structure of production	Changes in use of inputs, irrigation	Eurostat/Case studies	Case studies
	Extent of contract farming	Farmers' questionnaires	Case studies
Importance of durum wheat for labour use	Amount of labour time devoted to durum wheat	Eurostat/FADN/Farmers' questionnaires	Case studies
Degree of specialisation	Area under durum wheat versus to alternative crops	Eurostat/FADN/Farmers' questionnaires	Case studies

4.1.1 Changes in area durum wheat versus alternative crops

Table 4.2 highlights the changes in crop area across the EU pre- and post-reform for the major durum wheat producing countries (Italy, Spain, Greece, France and Portugal). The comparison is based on the summation of individual country data, hence the pre and post reform averages take account the different starting points for the reform.

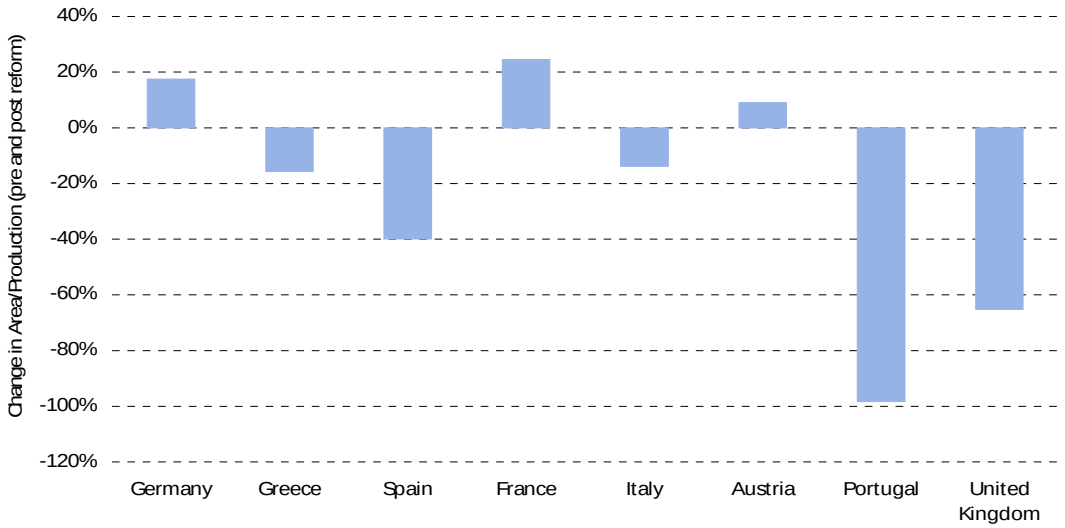
Table 4.2: Major EU producers area under competing crops ('000 hectares)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average Pre-reform	Average Post-reform
Durum Wheat	3,676	3,688	3,896	3,803	3,999	3,575	3,046	2,958	3,121	3,828	3,053
Common wheat	6,239	5,621	6,194	5,570	5,738	5,991	5,873	5,949		5,884	5,919
Maize	3,248	3,484	3,378	3,349	3,471	3,142	2,932	2,902		3,354	2,930
Sunflower	1,808	1,791	1,551	1,643	1,497	1,273	1,391	1,241		1,606	1,312
Rapeseed	1,023	923	859	898	938	1,028	1,166	1,402		947	1,283
Barley	5,299	5,162	5,213	5,298	5,240	5,220	5,349	5,412		5,237	5,367
Rye	204	186	183	184	171	163	174	167		183	171
Cotton	412	404	383	374	374	366	374	364		386	369
Set aside	3,160	3,563	3,368	3,446	3,422	2,979	3,740	3,902		3,326	3,776
Total	25,069	24,822	25,024	24,565	24,849	23,737	24,044	24,296		24,751	24,181

Note: Area only includes durum wheat growing areas (traditional and non-traditional), except for set aside which covers whole country area.
Source: Eurostat

The data reveal that the area under durum wheat fell by 20% following the reform from an annual average of 3.8 million hectares to 3.0 million hectares. This fall in area was partially compensated by rises in area for common wheat, rapeseed, barley and set-aside, while the total COP area also fell. This analysis hides differences by country. Diagram 4.1 shows changes in area by country for the EU-15, pre- and post-reform. The largest falls in area were in Portugal, UK and Spain. The area rose in Germany, France and Austria. In the case of Germany, Austria and UK, the area under durum wheat is small.

Diagram 4.1: Changes in durum wheat area, pre and post reform



Changes in area are further analysed for the case study countries in the following sections. These countries account for 96% of the total area under durum wheat.

In **France**, as shown in Table 4.3, the durum wheat area peaked at 456,000 hectares in 2007. Since 2006, the traditional area has increased by 4% while the non-traditional area has increased by 76%. In the traditional areas, the area under production has increased in Midi-Pyrénées, but fallen by close to 20% in Provence-Alpes-Côte d'Azur and Languedoc-Roussillon (Diagram 4.2). The area has largely been maintained in areas where other cereals are not well-suited due to poor soils and the dry and hot climate. As is the case with durum wheat, stability in planted area is also observed for the main competing COP crops: the common wheat area is largely unchanged, both in traditional and non-traditional regions, while there have been falls in the maize and sunflower areas. Maize is an exception in the analysis as it is primarily grown under irrigated conditions while the other crops are largely grown under non-irrigated conditions.

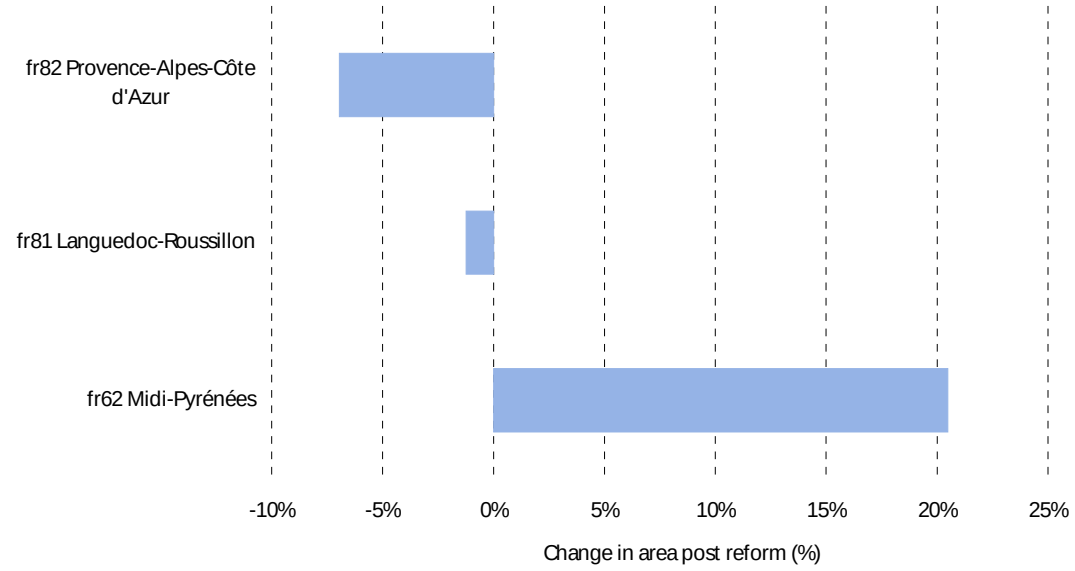
In the non-traditional areas, while the area has increased it still represents a minor part of the farmers' crop area (in the questionnaire, respondents reported that durum wheat accounted for an average of 10% of the total planted area). This increase in area is attributed to farmers wishing to diversify their planting. The single farm payment is seen as encouraging this as it reduces the risk of planting different crops because a proportion of income is guaranteed. In addition, durum wheat prices rose relative to common wheat enhancing durum wheat's profitability. This made it beneficial for farmers to switch some of there crop area to durum wheat. That this did not occur in the traditional areas was partly due to the higher yields in the non-traditional areas which significantly increased per hectare revenues.

Table 4.3: France, Durum wheat and competing COP crop areas ('000 hectares)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average	
Traditional Area										Pre-reform	Post reform
Durum wheat	245	235	265	252	291	307	277	278	280	266	278
Common wheat	347	330	344	285	338	317	330	332		327	331
Maize	374	380	381	329	362	328	298	297		359	297
Sunflower	234	227	217	251	220	231	226	196		230	211
Rapeseed	53	42	36	39	35	44	64	91		41	77
Barley	108	112	110	106	98	101	108	109		106	108
Rye	5	4	4	3	3	3	4	4		4	4
Non-trad Area											
Durum wheat	94	71	70	100	116	116	176	178	156	94	170
Common wheat	3,522	3,192	3,538	3,274	3,479	3,519	3,451	3,439		3,421	3,445
Maize	1,036	1,144	1,084	1,024	1,079	954	872	890		1,053	881
Sunflower	468	456	377	419	374	389	392	302		414	347
Rapeseed	904	836	807	849	895	977	1,093	1,258		878	1,175
Barley	1,426	1,592	1,533	1,653	1,532	1,501	1,560	1,590		1,540	1,575
Rye	27	24	25	25	30	28	23	23		26	23

Source: Eurostat

Diagram 4.2: France, Change in Planted Area in Traditional Areas by Region



Source: Eurostat

In **Italy**, the durum wheat area peaked in 2004 at 1.77 million hectares. Production is dominated by traditional areas. Following the introduction of the reform, which was enacted at the beginning of 2005, the average planted area over the 2005-08 period was 16% less than that prior to the reforms as revealed by Table 4.4. In the traditional areas, the area under durum wheat fell in all regions with the largest falls in Tuscany and Calabria (Diagram 4.3). The reduction in the traditional area has not been picked up by an increase in area of the alternative crops although the area set aside has increased. There has been a reduction in the total utilised agricultural area. With higher prices and the area under durum wheat increased in 2008, although not back to pre-reform levels.

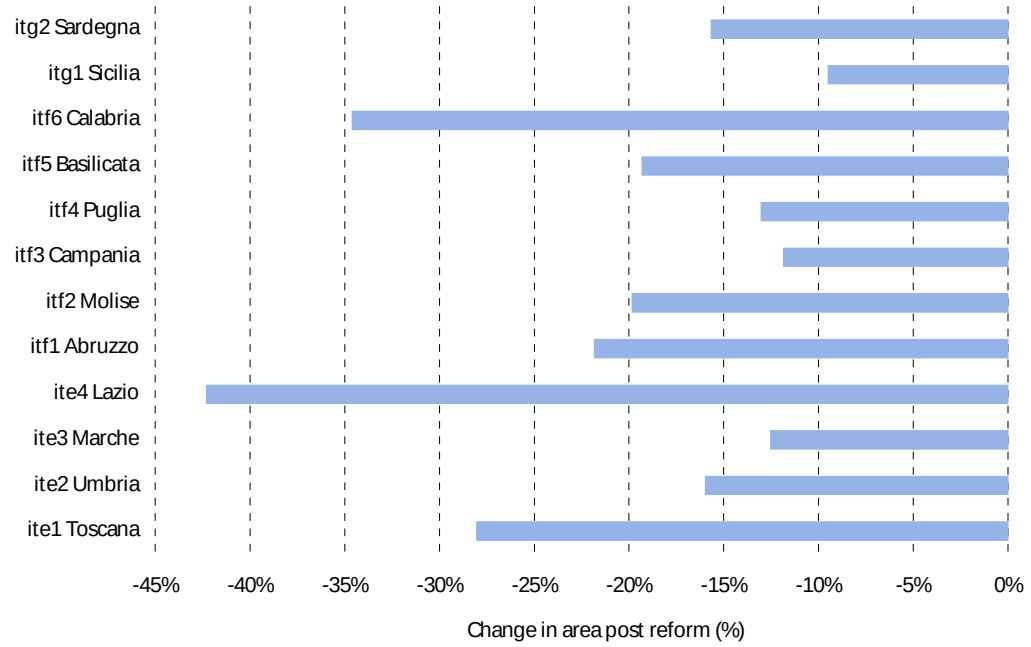
Over the same period, the non-traditional area more than doubled over 100,000 hectares. This was attributed to the abolition of compulsory set aside and an increase of plantings on areas that were previously planted with sugar beet. The sugar beet areas fell as the sugar quota was reduced.

Table 4.4: Italy, durum wheat and competing COP crop area ('000 hectares)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average	
Traditional area										Pre-reform	Post reform
Durum wheat	1,634	1,643	1,705	1,663	1,743	1,491	1,301	1,372	1,472	1,677	1,388
Common wheat	274	258	241	218	215	216	206	211		241	211
Maize	137	134	140	143	140	125	125	121		139	123
Sunflower	185	175	139	128	105	112	119	107		146	113
Rapeseed	29	21	7	3	2	2	2	3		12	2
Barley	226	228	225	195	194	203	207	212		213	207
Rye	1	1	1	1	1	1	1	2		1	1
Non trad areas											
Durum wheat	29	22	29	26	30	29	42	65	105	27	60
Common wheat	384	367	440	358	367	387	377	450		383	404
Maize	926	975	971	1,020	1,056	988	982	932		989	968
Sunflower	32	33	26	23	20	18	26	19		27	21
Rapeseed	7	6	3	2	2	2	2	4		4	2
Barley	118	105	117	115	114	117	126	133		114	125
Rye	3	2	3	2	2	2	2	2		2	2

Source: Eurrostat

Diagram 4.3: Italy, Change in Planted Area in Traditional Areas by Region



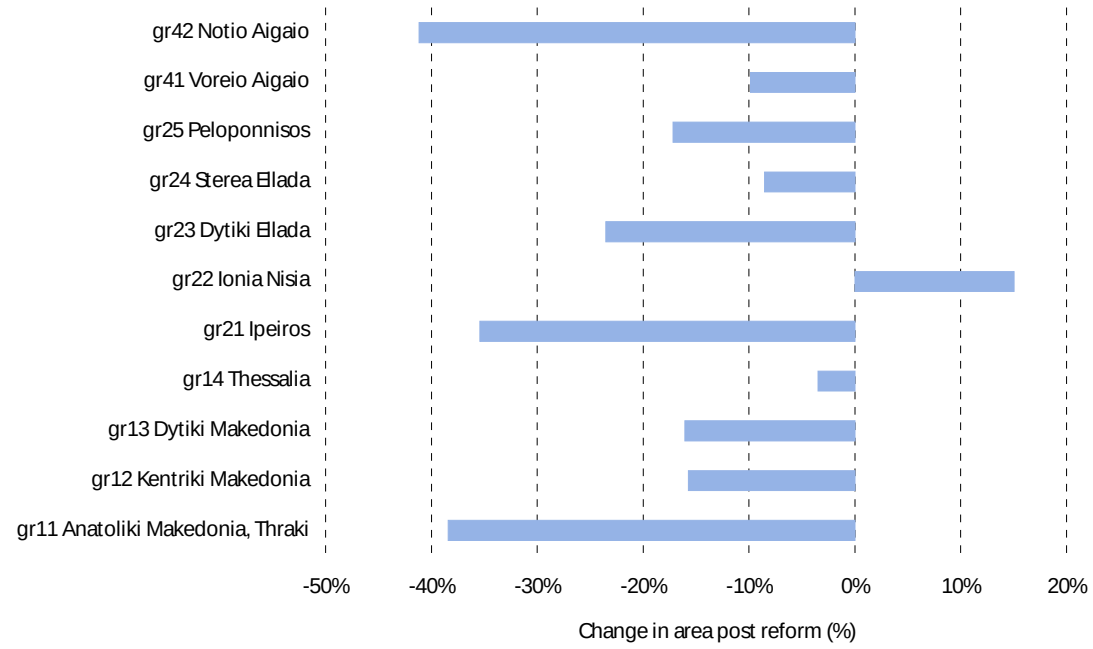
In **Greece**, traditional areas account for almost the totality of total durum wheat areas (99%). Total area peaked in 2004 at 719,000 hectares. Following the adoption of the reform, the average planted area over the 2006-08 period was 16% less than that prior to the reforms as revealed by Table 4.5. Within the traditional areas, the area under durum wheat fell in all regions with the exception of Ionia Nisia, but here the area is less than 2,000 hectares (Diagram 4.4). Examining changes in area for the main alternative crops suggests that the cotton area has fallen slightly, while there has been a modest increase in the common wheat and maize area. As in Italy, there has been some increase in the set aside area, although most of this increase occurred in 2004 ahead of the reform. As with Italy, the total farmed area has fallen.

Table 4.5: Greece, durum wheat and competing crop areas in traditional areas ('000 hectare)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average	
										Pre-reform	Post reform
Durum wheat	660	691	704	696	712	711	626	561	575	695.8	593.2
Common wheat	188	176	156	143	125	119	145	169	172	151.2	156.9
Maize	216	212	223	241	243	247	232	239	237	230.2	235.5
Cotton	411	403	382	374	373	366	373	363	302	384.6	368.0
Barley	118	116.7	111.4	103.2	*103*	*103*	*103*	*103*	*103*	109.3	103.2
Rye	14.7	15	15	14.9	*15*	*15*	*15*	*15*	*15*	14.9	14.9
Set aside	30	46	14	65	90	86	105	100	na	55.2	102.5
Total	1,476	1,481	1,465	1,453	1,453	1,443	1,375	1,332	1,287	1,461.8	1,353.7

Source: Eurostat

Diagram 4.4: Greece, Change in Planted Area in Traditional Areas by Region



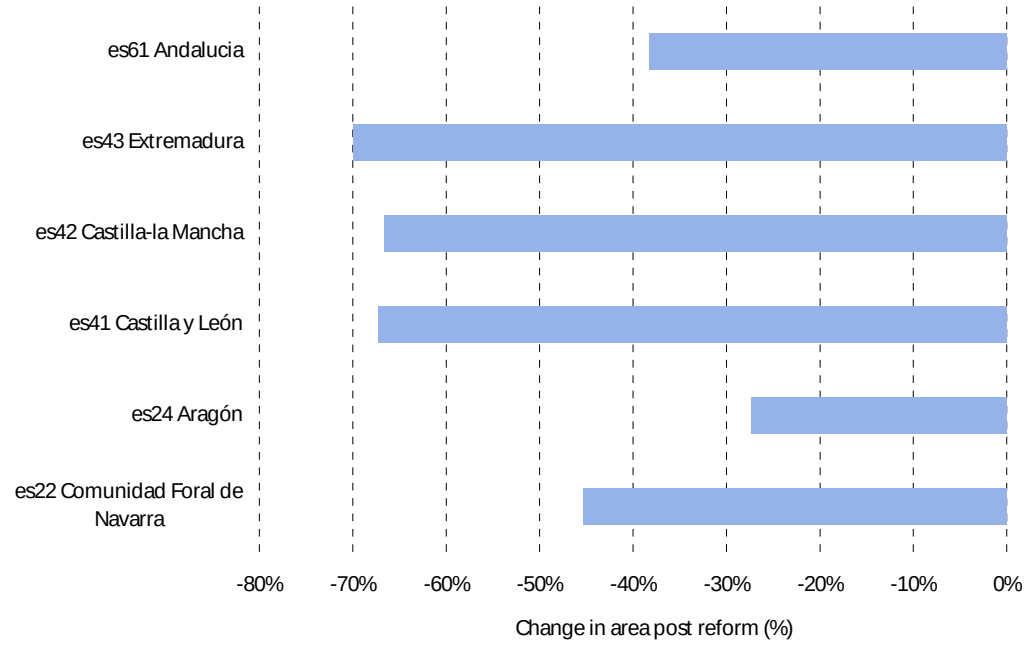
In **Spain,** traditional areas account for the vast majority of durum wheat area, at over 99%. Total Spanish durum wheat area peaked in 2004 at 949,000 hectares, with a traditional area of 942,000 hectares. Following the reform, which was enacted at the beginning of 2006, the average planted area over the 2006-08 period was 40% less than that prior to the reforms (Table 4.6). Area declined in all regions, with Andalucia witnessing the greatest fall at around 200,000 hectares (Diagram 4.5). Table 4.6 highlights changes in crop area in the traditional durum wheat growing areas, again there is little difference in the total area of the alternative crops, although, there are significant differences within regions, for instance in Andalucia, the case study region, the reduction durum wheat area (154,000 hectares between 2005 and 2006) was met by a large increase in the common wheat area (a rise of 80,000 hectares).

Table 4.6: Spain, durum wheat and competing crop areas in traditional areas ('000 hectares)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average Pre-reform	Average Post reform
Durum wheat	867	883	924	912	942	909	613	496	528	906.2	554.5
Common wheat	1,263	1,096	1,277	1,100	1,047	1,164	1,123	1,148	1,346	1,157.7	1,135.6
Maize	41	71	63	66	63	53	30	30	30	59.4	29.6
Sunflower	367	315	312	300	305	180	242	215	288	296.3	228.5
Rapeseed	7	5	1	1	1	1	1	3	2	2.6	1.8
Barley	211.1	199.4	194.2	201.1	191.1	191.6	227.5	238.5	256.5	198.1	233.0
Rye	0.5	0.4	0.2	0.4	0.3	0.4	0.5	0.329	0.271	0.4	0.4

Note: Area data are not available for maize for 2007 and 2008, we have assumed no change in the area from 2006 levels
Source: Eurostat

Diagram 4.5: Spain, Change in Planted Area in Traditional Areas by Region



Of the other producers, Portugal is the most important. Following the reform, the area under durum wheat collapsed from over 150,000 hectares in 2004 to under 5,000 hectares. This fall was compensated for by an increase in common wheat production. The fall occurred as the gross margin for common wheat rose above that of durum wheat and in the absence of aids for durum wheat, farmers switched production (Table 4.7).

Table 4.7: Portugal durum wheat and competing crop areas ('000 hectares)

Area	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post-reform
Commonwheat	87.40	50.00	42.40	30.20	35.40	120.60	101.40	53.50	85.40	49.08	90.23
durumwheat	138.90	133.50	188.30	144.20	152.00	2.10	3.30	1.40	3.00	151.38	2.45
Rye	44.70	37.60	33.50	30.30	28.60	25.40	23.50	22.20	21.30	34.94	23.10
Barley	21.80	11.80	11.20	11.50	15.90	34.30	44.20	40.50	43.10	14.44	40.53
Maize	153.00	155.10	140.30	141.60	137.50	110.20	102.80	104.30	109.60	145.50	106.73
Sunflower	51.80	41.50	37.60	36.60	28.40	7.10	7.80	17.60	24.40	39.18	14.23

Source: FADN

4.1.2 Durum wheat production and yields

While the area under durum wheat fell by 20% following the reform, the effect on production was less severe. Average annual production in the EU-27 was 6% lower following the reform, although if 2008 is removed, when higher prices led to increased plantings, production was 9% lower. Average production fell by 13% in traditional regions and areas rose by 64% in non-traditional regions. Post-reform the traditional area accounts for 85% of production, compared to 91% of production pre-reform (Table 4.8).

Table 4.8: Durum wheat production, traditional and non-traditional areas ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average Pre-reform	Average Post-reform
France	1,685	1,339	1,614	1,427	2,085	2,042	2,112	1,993	2,126	1,699	2,077
Traditional	1,086	923	1,126	888	1,305	1,300	1,106	1,032	1,098	1,105	1,079
Non-traditional	599	416	488	539	781	743	1,006	961	1,028	594	998
Italy	4,310	3,624	4,315	3,755	5,601	4,470	4,041	3,973	5,187	4,321	4,418
Traditional	4,159	3,517	4,165	3,622	5,419	4,284	3,790	3,648	4,558	4,176	4,070
Non-traditional	151	107	149	134	182	186	251	326	629	145	348
Greece	1,784	1,721	1,635	1,375	1,724	1,677	1,402	1,218	1,594	1,653	1,405
Traditional	1,764	1,711	1,618	1,361	1,710	1,667	1,393	1,209	1,581	1,638	1,394
Non-traditional	20	10	18	14	14	10	9	9	13	14	10
Spain	1,939	1,900	2,153	1,989	2,708	935	1,643	1,233	1,145	1,937	1,340
Traditional	1,937	1,896	2,150	1,986	2,690	933	1,642	1,232	1,144	1,932	1,340
Non-traditional	2	3	4	3	18	2	1	0	0	5	1
Portugal	173	103	327	113	235	1	8	3	4	190	4
OtherTraditional	84	109	106	108	159	141	77	67	91	118	94
othernon-traditional	119	146	74	63	117	104	83	34	10	104	58
Total	10,093	8,941	10,224	8,832	12,628	9,369	9,365	8,521	10,156	10,021	9,395
Traditional	9,203	8,259	9,492	8,079	11,517	8,326	8,015	7,191	8,476	9,159	7,980
Non-traditional	891	682	732	753	1,111	1,043	1,350	1,330	1,680	862	1,415

Source: Eurostat

That the fall in production was not as great as the fall in area points towards a rise in average yields. Table 4.9 reveals trends in yields for the four case study countries. The table reveals that in France and Greece, there has been little change in average yields since the introduction of the reform. In Spain, yields have risen, on average, although this is largely because poor yields in 2004/05, owing to drought, brought average pre-reform yields down. When this observation is removed from the analysis, the rise in average yields is found to be much smaller (a rise of 4%). In Italy, the rise in average yields is more significant a rise, a 16% increase compared to the pre-reform period.

Table 4.9: Durum wheat yields, traditional and non-traditional areas (kg/ha)

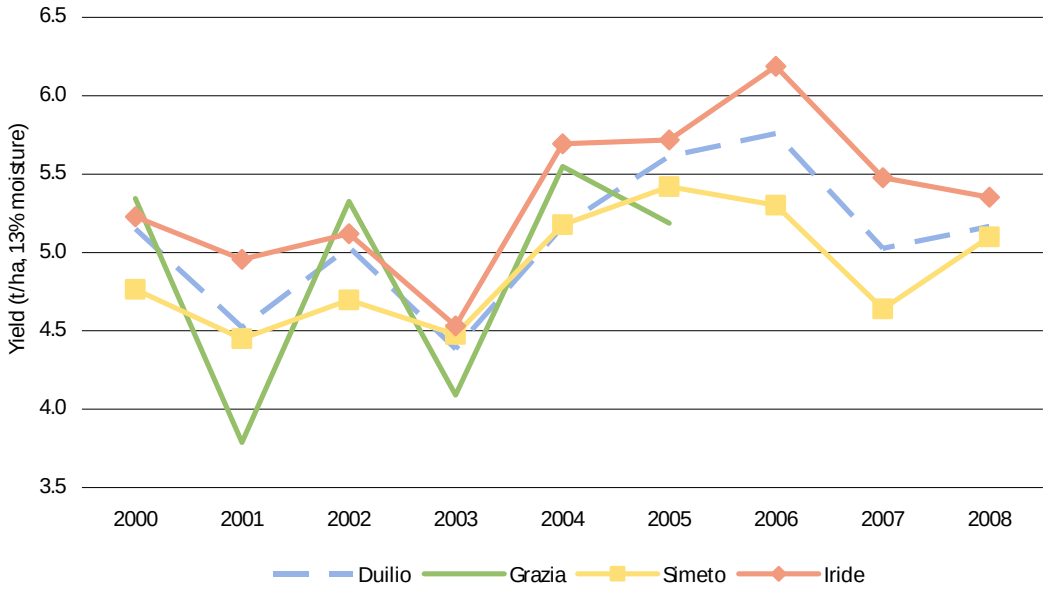
Yield	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average Pre-reform	Average Post-reform
France	5,506	3,990	4,575	3,510	4,932	4,502	4,631	4,566	4,789	4,503	4,599
Traditional	*4,619*	*3,483*	*4,461*	*3,053*	*4,245*	*4,688*	*3,982*	*3,680*	*3,922*	*4,091*	*3,831*
Non-trad	*8,453*	*5,901*	*4,865*	*4,659*	*6,758*	*4,210*	*5,644*	*6,159*	*6,268*	*5,807*	*5,902*
Italy	2,592	2,178	2,489	2,223	3,161	2,941	3,009	2,765	3,289	2,529	3,001
Traditional	*2,545*	*2,141*	*2,443*	*2,178*	*3,110*	*2,873*	*2,913*	*2,659*	*3,096*	*2,484*	*2,885*
Non-trad	*5,217*	*4,986*	*5,220*	*5,135*	*6,159*	*6,436*	*6,007*	*5,013*	*5,978*	*5,343*	*5,859*
Greece	2,668	2,463	2,294	1,954	2,397	2,331	2,216	2,145	2,749	2,351	2,370
Traditional	*2,670*	*2,477*	*2,296*	*1,955*	*2,402*	*2,343*	*2,227*	*2,156*	*2,750*	*2,358*	*2,378*
Non-trad	*2,495*	*1,263*	*2,095*	*1,821*	*1,924*	*1,223*	*1,304*	*1,267*	*2,627*	*1,804*	*1,732*
Spain	2,235	2,146	2,325	2,178	2,854	1,026	2,676	2,486	2,165	2,127	2,442
Traditional	*2,235*	*2,148*	*2,326*	*2,179*	*2,855*	*1,026*	*2,677*	*2,487*	*2,168*	*2,128*	*2,444*
Non-trad	*2,750*	*1,455*	*1,944*	*1,733*	*2,766*	*1,500*	*1,667*	*1,366*	*606*	*2,025*	*1,213*

Source: Eurostat

While this analysis indicates that yields rose in Italy, interviewed farmers revealed that there had been no change in the level of input use following the reform. The question then is what caused the increase in yields? A closer examination of the data reveals that the rise in yields began in 2004 a year before the introduction of the reform. There are two possible solutions: first, growing conditions have been more favourable for production in recent years; and/or,

second, farmers have changed to higher yielding varieties. An indication of the effect of weather conditions can be gained by examining yields for particular varieties from experimental plots. Diagram 4.6 shows yields for four popular varieties, yields were on average higher in the post reform period. For instance, yields for the Duilio variety were on average 11% higher in the post reform period. This supports the influence of weather patterns on yields. In addition, in the questionnaires, growers revealed that the most important reason for changing variety was improved yields and 75% reported that they had changed variety over the last five years. This suggests that varieties also played a part in the rise in average yields.

Diagram 4.6: Italy, selected varieties experimental plot yields



Source: Agricultural Research Council (CRA)

4.1.3 The relationship between gross margins and areas planted

Durum wheat gross margins

Using FADN data to 2006 and the results of the field work to 2008 (as set out in Chapter 1), gross margins were calculated for each of the case study countries, with the focus being on traditional producing regions. The gross margin is defined as the difference between per hectare durum wheat revenues (comprising the durum wheat sales price, a function of yields and the per tonne sales price, and the coupled support) and variable costs. To show the effect of the reform on gross margins we consider two post reform periods 2006 and 2008. 2008 is shown separately as both prices and costs rose strongly during this year. The results are shown in Table 4.10. Considering the situation in each of the case study countries:

In **Italy** with a fall in durum wheat support following the reform, the gross margin fell from €429 per hectare to an average of €94 per hectare in 2005 and 2006. In 2008 both costs and the durum wheat sales price rose significantly, the net effect is for the gross margin to rise to €440 per hectare. In **Spain**, with the introduction of the reform, the gross margin fell from an average of €583 per hectare to €403 per hectare. The gross margin rose to €510 per tonne in 2008. In **France**, in traditional regions, the gross margin fell from an average of €456 per hectare to €239 per hectare in 2006/07. With higher price and costs in 2008, the gross margin rose to €450 per hectare. In **Greece**, with the change in support, coupled payments fell by €340 per hectare. The gross margin fell from an average of €361 per hectare in the three years prior to the change in regime to €147 per hectare in 2006. In 2008, the gross margin rose to €458 per hectare.

Table 4.10: Durum wheat, revenues, costs and gross margins (€/ha)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post reform	
Italy											2005-07	2008
Revenue												
Yield	2.48	2.41	2.36	2.22	2.80	2.71	2.87	2.62	3.05	2.45	2.73	3.05
Price per tonne	153	178	165	170	142	150	186	230	334	161	189	334
Cereals Compensatory Payment (€/ha)	97	113	108	109	111	-	-	-	-	107	-	-
Art 69 (t/ha)	-	-	-	-	-	48	54	51	51		51	51
DW Supplement (€/ha)	346	344	316	324	287	-	-	-	-	323	-	-
DW Quality Premium (€/ha)	-	-	-	-	38	38	38	38	38		38	38
Total Revenue	822	886	812	811	832	492	627	692	1,108	827	604	1,108
Variable cost	362	399	393	424	412	459	511	560	668	398	510	668
Gross Margin	460	488	419	386	420	33	116	131	440	429	94	440
Spain												
Revenue											2006-07	2008
Yield	2.85	2.74	2.32	2.78	2.62	1.44	2.80	2.80	2.80	2.46	2.80	2.80
Price per tonne	130	161	144	143	148	142	146	201	237	145	174	237
Cereals Compensatory Payment (€/ha)	145	184	166	188	164	207	49	49	49	176	49	49
DW Supplement (€/ha)	215	284	272	279	238	220	73	73	73	251	73	73
DW Quality Premium (€/ha)	-	-	-	-	29	45	39	39	39	37	39	39
Total Revenue	730	909	773	864	820	677	570	723	824	820	646	824
Variable costs	179	295	234	230	239	246	242	245	314	237	243	314
Gross Margin	551	614	539	635	581	431	328	478	510	583	403	510
France											2005-07	2008
Revenue												
Yield	4.15	4.18	3.38	3.17	4.24	3.50	3.31	3.31	3.31	3.77	3.31	3.31
Price per tonne	123	154	151	165	139	139	131	224	280	145	177	280
Cereals Compensatory Payment (€/ha)	259	292	279	279	298	275	68	68	68	280	68	68
DW Supplement (€/ha)	287	270	305	311	270	240	99	99	99	281	99	99
DW Quality Premium (€/ha)	-	-	-	-	-	-	40	40	40		40	40
Total Revenue	1,057	1,205	1,095	1,113	1,156	1,003	641	947	1,133	1,108	794	1,133
Variable cost	823	693	494	602	674	626	557	555	683	652	556	683
Gross Margin	235	512	601	511	482	376	85	393	450	456	239	450
Greece											2005-07	2008
Revenue												
Yield	2.00	2.16	2.01	1.69	2.10	1.93	2.11	2.04	2.61	1.99	2.03	2.61
Price per tonne	138	149	137	149	134	136	130	139	298	141	135	298
Cereals Compensatory Payment (€/ha)	139	150	153	154	154	152	-	-	-	150	76	-
Art 69	-	-	-	-	-	-	108	86	98		97	98
DW Supplement (€/ha)	320	328	334	334	323	302	-	-	-	328	-	-
DW Quality Premium (€/ha)	-	-	-	-	40	40	40	40	40		40	40
Total Revenue	736	800	763	740	798	757	422	409	915	760	529	915
Variable cost	390	402	418	386	396	396	376	375	457	398	382	457
Gross Margin	346	398	345	354	402	360	46	35	458	361	147	458

Note: In Italy one farm was excluded from the analysis in 2005 given the high level of costs for SE305 and SE370. In both cases costs were close to €1mn

Cereal compensatory payments for Italy are derived from FADN data for just the southern producing regions and are low compared to the average for all durum wheat farms. The annual average for all durum wheat farms varies from €240 to €320 per hectare.

Source: FADN, 2008 estimated from FADN adjusted for changes to costs and market prices. This changes prices and costs are based on field work estimates and questionnaire responses. From the questionnaire responses the assumption is made that there has been no change in the intensity of input use.

Alternative Crops

The main alternative crops considered are common wheat, sunflower, maize and cotton in the case of Greece. The calculation of gross margins uses the same methodology as durum wheat and is based on FADN data. The data are for alternative crop specialists in the traditional durum wheat areas in order to provide a like-for-like comparison. In order to calculate revenue from the crops, as with durum wheat, support has been decoupled: in France and Spain 25% of coupled payments remain, while in Italy, producers receive payments under Article 69. The amount of support under Article 69 is the same per hectare as durum wheat.

In **Italy**, the data reveal that of the COP crops, maize is the most profitable, although it requires irrigated land. This is followed by durum wheat. Following the reform, the ranking of durum wheat and the other alternative crops does not initially change, although after 2006 the return to common wheat rises above durum wheat. This explains why initially the area of alternative crops did not rise following the reform (Table 4.11 and Diagram 4.7).

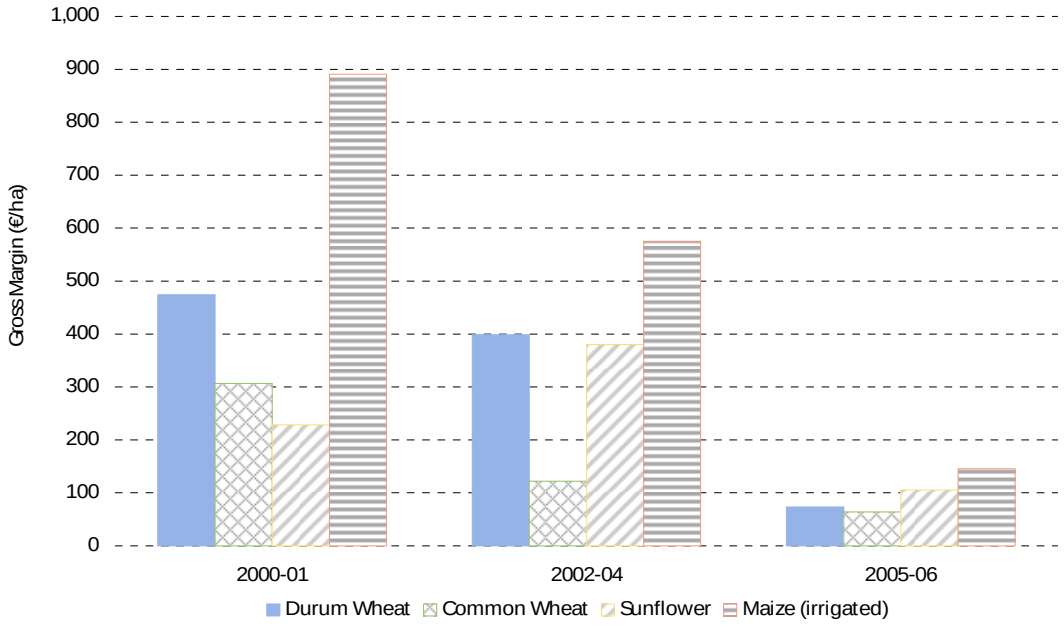
Table 4.11: Italy: Alternative Crop Gross Margins (€per hectare)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Common Wheat									
Revenue									
Yield	2.67	2.73	2.66	2.38	3.24	3.20	2.93	2.88	2.51
Price per tonne	160.7	160.5	142.0	146.7	125.3	164.4	139.2	173.0	326.4
Cereals Compensatory Payment (€/ha)	178.2	200.9	204.8	239.2	234.8	-	-	0.0	0.0
Art 69 (t/ha)	0.0	0.0	0.0	0.0	0.0	47.8	53.7	50.7	50.7
Total Revenue	607.1	639.3	583.1	589.1	640.5	574.3	460.8	549.0	869.8
Variable Cost	302.5	330.2	399.5	638.4	418.2	554.6	349.5	381.0	461.1
Gross Margin	304.7	309.1	183.6	-49.2	222.3	19.7	111.3	168.0	408.7
Sunflower									
Revenue									
Yield	2.09	2.03	2.10	2.17	2.05	1.90	2.17	2.04	2.04
Price per tonne	170.0	199.1	230.4	191.5	211.7	218.3	187.2	206.9	293.7
Cereals Compensatory Payment (€/ha)	211.9	242.2	238.8	215.8	212.9	-	-	0.0	0.0
Art 69 (t/ha)	0.0	0.0	0.0	0.0	0.0	47.8	53.7	50.7	50.7
Total Revenue	566.6	647.2	722.4	630.4	647.3	462.3	460.2	473.5	650.8
Variable Cost	473.5	284.6	270.7	292.1	297.5	302.7	441.8	485.3	588.2
Gross Margin	93.0	362.6	451.8	338.3	349.8	159.6	18.4	-11.8	62.6
Maize									
Yield	7.68	8.68	7.30	6.30	5.40	5.92	6.33		
Price per tonne	150.6	150.0	149.1	170.1	149.0	146.6	161.9		
Cereals Compensatory Payment (€/ha)	189.4	202.3	185.6	145.5	161.3				
Art 69 (t/ha)						47.8	53.7		
Total Revenue	1,346.3	1,504.6	1,273.7	1,216.8	965.3	915.0	1,078.7		
Variable Cost	441.8	627.4	485.1	669.7	576.6	767.1	996.2		
Gross Margin	904.5	877.2	788.6	547.1	388.7	148.0	82.5		

Note: The maize yield in 2006 from the FADN data is 9.3 tonnes per hectare. The higher yield is due to a change in the sample, for consistence the yield has been set at the average between 2002-2004

Source: FADN, 2007 and 2008 estimated from FADN adjusted for changes to costs and market price

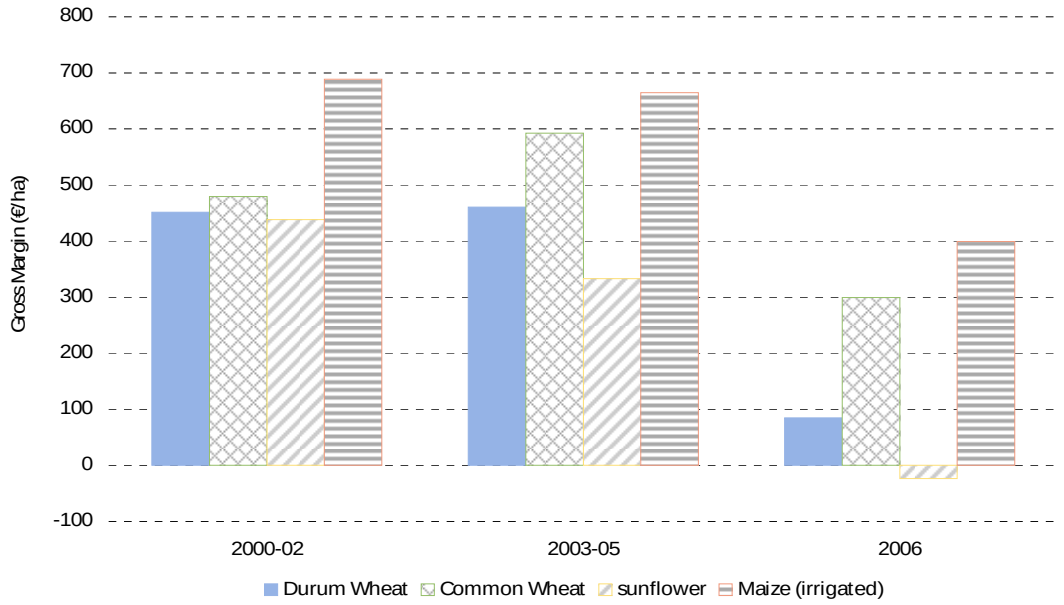
Diagram 4.7: Italy average gross margin, durum wheat versus competing COP crops (€ per hectare)



Source: FADN

In the **French** traditional regions the ranking of durum wheat and the other alternative crops did not change, until 2008 when the rise in the durum wheat price differential over common wheat increases the gross margin for durum wheat over common wheat (Diagram 4.8 and Table 4.12).

Diagram 4.8: France average gross margin, traditional regions durum wheat versus competing COP crops (€ per hectare)



Source: FADN

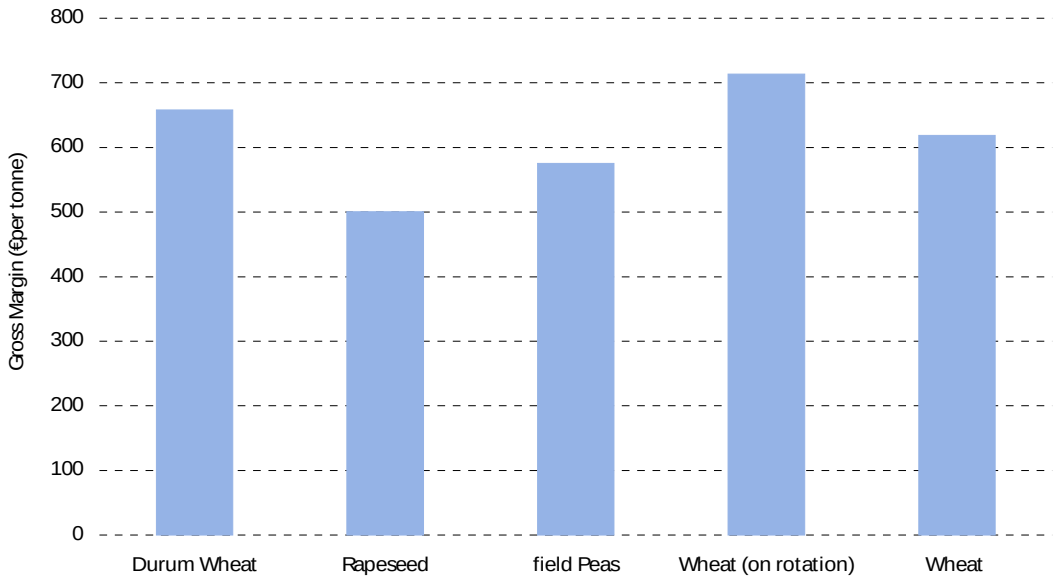
Table 4.12: France, Alternative Crop Gross Margins (€per hectare)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Common Wheat									
DW Quality Premium (€/ha)									
Yield	5.73	5.02	5.96	5.86	5.88	5.10	5.47	4.55	5.10
Price per tonne	111.1	133.5	102.0	165.1	126.2	123.2	121.2	134.0	206.0
Cereals Compensatory Payment (€/ha)	300.0	292.0	307.6	338.4	306.4	291.3	79.0	79.0	79.0
Total Revenue	937.3	961.7	915.4	1,305.4	1,048.7	920.0	742.4	688.4	1,130.5
Variable Cost	473.5	501.9	416.1	710.6	389.6	385.3	443.1	431.3	540.6
Gross Margin	463.8	459.8	499.3	594.8	659.1	534.7	299.3	257.1	589.9
Sunflower									
Yield	3.12	2.24	3.06	1.90	1.99	2.17	2.16	2.29	2.29
Price per tonne	155.5	241.4	237.8	177.9	185.9	189.6	174.8	241.0	351.4
Cereals Compensatory Payment (€/ha)	273.0	304.9	302.5	304.6	314.2	294.7	73.3	73.3	73.3
Total Revenue	758.0	844.7	1,030.4	641.8	684.6	706.8	450.8	625.1	877.9
Variable Cost	386.0	387.0	415.8	463.4	586.1	374.0	475.0	563.4	688.6
Gross Margin	372.1	457.7	614.6	178.4	98.4	332.8	-24.2	61.6	189.2
Maize									
Yield	9.34	9.17	9.60	7.33	9.35	9.21	9.50		
Price per tonne	115.6	116.7	109.0	136.4	100.5	110.3	134.4		
Cereals Compensatory Payment (€/ha)	453.3	470.7	499.5	487.5	418.6	401.0	99.3		
Total Revenue	1,533.8	1,540.8	1,545.6	1,487.4	1,358.6	1,417.0	1,376.3		
Variable Cost	840.2	882.6	828.8	789.5	824.3	861.2	864.1		
Gross Margin	693.6	658.1	716.9	697.9	534.3	555.8	512.2		

Source: FADN 2007 and 2008 estimated from FADN adjusted for changes to costs and market price

Data from the case study area, the Centre region, which is a non-traditional area, allow us to compare the ranking of gross margins in a non-traditional area. Data for the non-traditional areas are not available from FADN due to the lack of durum wheat specialists. Diagram 4.9 reveals that durum wheat has the highest gross margin of the major COP crops. The gross margin for durum wheat is higher than that of common wheat, although when common wheat is grown as part of a rotation, its gross margin becomes higher. The high gross margin has encouraged increased planting and production. Consequently, the area under durum wheat in non-traditional areas in France has increased. The main difference between the traditional and non-traditional areas is that yields are considerably higher in the non- traditional areas. This both increases revenue per hectare and reduces costs per hectare.

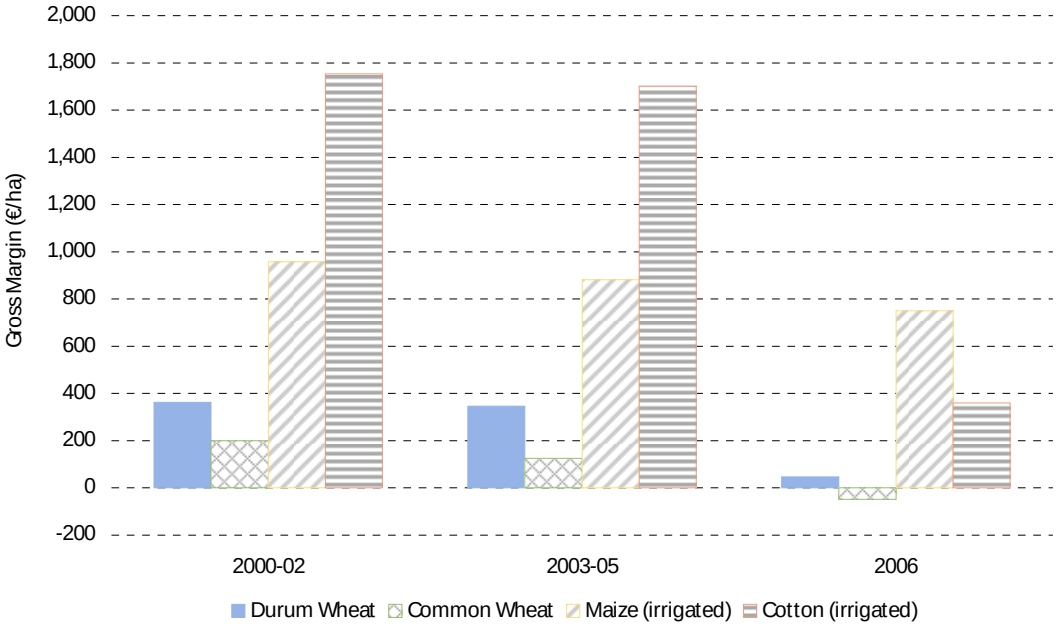
Diagram 4.9: France average gross margin, durum wheat versus competing COP crops Eure et Loir, average 2006 -08 (€ per hectare)



Source: Cerel

In **Greece**, the main alternative crops considered are common wheat, maize and cotton. In the latter two cases, maize and cotton require irrigation. The data reveal that the irrigated crops have the highest gross margins, but where irrigation is not required the ranking between durum wheat and common wheat remains unchanged following the reform as shown in Diagram 4.10 and Table 4.13.

Diagram 4.10: Greece average gross margin, traditional regions durum wheat versus competing COP crops (€ per hectare)



Source: FADN

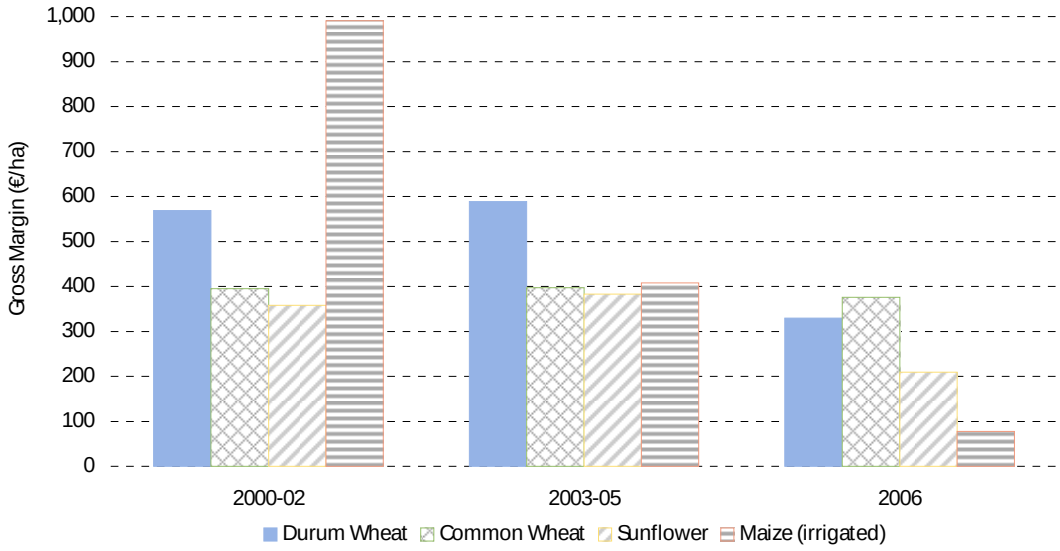
Table 4.13: Greece, Alternative Crop Gross Margins (€per hectare)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Common Wheat									
Yield	2.47	2.66	2.78	2.07	3.15	3.14	3.00	3.79	3.65
Price per tonne	141.1	149.7	128.1	144.7	133.3	128.0	125.3	111.1	231.1
Cereals Compensatory Payment (€/ha)	139.2	150.1	152.9	153.6	153.6	152.1			
Total Revenue	486.9	548.3	508.4	453.5	573.4	553.5	376.0	421.3	843.9
Variable Cost	341.4	303.5	299.5	382.3	445.6	387.4	423.6	422.1	514.9
Gross Margin	145.5	244.7	208.9	71.2	127.8	166.1	-47.6	-0.8	329.0
Cotton									
Yield	3.51	3.60	3.47	3.07	3.58	3.73	2.57		
Price per tonne (including support to 2005)	855.0	721.0	808.0	944.0	781.0	839.0	317.0		
coupled payment	0.0	0.0	0.0	0.0	0.0	0.0	529.0		
Total Revenue	2,999.5	2,595.4	2,805.8	2,901.6	2,795.9	3,133.3	1,342.6		
Variable Cost	938.3	1,000.7	1,210.6	1,232.1	1,326.2	1,212.8	983.3		
Gross Margin	2,061.2	1,594.7	1,595.3	1,669.5	1,469.7	1,920.5	359.3		
Maize									
Yield	12.21	12.46	12.95	12.79	12.96	12.58	12.68		
Price per tonne	130.6	130.3	131.0	137.1	129.2	117.1	129.8		
Cereals Compensatory Payment (€/ha)	142.3	155.1	155.5	155.6	155.7	155.4	-		
Total Revenue	1,737.5	1,779.0	1,852.6	1,908.4	1,830.6	1,628.6	1,645.7		
Variable Cost	871.9	736.7	886.4	934.3	932.8	854.0	895.4		
Gross Margin	865.5	1,042.3	966.2	974.1	897.8	774.6	750.3		

Source: FADN 2007 and 2008 estimated from FADN adjusted for changes to costs and market price

In **Spain**, costs are based on those in the southern regions. The data reveal that of the COP crops, prior to the reform, maize was the most profitable, although it requires irrigated land. This was followed by durum wheat. Following the reform, the relative margin between common wheat and durum wheat switched, with common wheat having on average a higher gross margin as shown by Diagram 4.11 and Table 4.14. This explains why a number of producers in Andalucia switched production to common wheat following the reform.

Diagram 4.11: Spain average gross margin, traditional regions durum wheat versus competing COP crops (€ per hectare)


1,000
900
800
700
600
500
400
300
200
100
0
Gross Margin (€/ha)
2000-02
2003-05
2006
Durum Wheat
Common Wheat
Sunflower
Maize (irrigated)

Source: FADN

Table 4.14: Spain, Alternative Crop Gross Margins (€per hectare)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Common Wheat									
Yield	3.44	2.17	2.70	2.78	3.55	1.57	3.00	4.30	4.15
Price per tonne	129.8	144.3	139.1	126.5	140.4	135.8	162.8	147.0	228.0
Cereals Compensatory Payment(€/ha)	145.4	183.8	166.5	187.8	164.0	207.3	48.7	48.7	48.7
Total Revenue	592.2	497.5	541.9	539.3	662.8	420.4	537.1	681.5	994.0
Variable Cost	138.9	160.4	156.6	146.3	142.2	140.0	161.4	163.6	213.8
Gross Margin	453.3	337.1	385.2	393.0	520.6	280.3	375.7	517.9	780.2
Sunflower									
Yield	1.57	1.46	1.83	1.67	1.77	1.65	1.73	1.16	1.13
Price per tonne	188.9	235.9	226.4	215.1	225.1	237.2	233.0	233.0	339.7
Cereals Compensatory Payment(€/ha)	174.7	211.8	215.6	295.2	210.2	226.1	56.5	56.5	56.5
Total Revenue	471.2	555.9	629.7	654.2	609.6	617.6	459.8	327.8	440.9
Variable Cost	138.2	176.4	268.5	277.4	260.7	195.2	250.3	252.7	322.6
Gross Margin	333.0	379.4	361.3	376.8	348.8	422.3	209.5	75.1	118.2
Maize									
Yield	10.77	10.70	11.08	10.39	12.22	11.68	9.79		
Price per tonne	148.4	143.1	148.5	132.3	129.4	124.9	134.6		
Cereals Compensatory Payment(€/ha)	158.4	158.4	158.4	158.4	158.4	158.4	39.6		
Total Revenue	1,755.7	1,689.4	1,803.9	1,533.9	1,739.4	1,617.9	1,357.5		
Variable Cost	392.6	790.0	727.0	1,215.0	1,107.8	1,350.1	1,240.6		
Gross Margin	1,363.1	899.4	1,076.9	318.9	631.6	267.8	116.9		

Source: FADN 2007 and 2008 estimated from FADN adjusted for changes to costs and market price

The counterfactual case

The counterfactual case is the case where all coupled support reverts to zero. This not only allows us to understand what would happen in the absence of support, but it is also important in aiding our understanding of the extent that the CAP measures have ensured the maintenance of production in traditional areas. To assess the counterfactual case, gross margins are recalculated with all coupled support removed. This is calculated at both 2006 prices and costs and 2008 prices and costs. The difference being that 2006 prices and costs are more in line with those that existed prior to the introduction of the reform, while 2008 prices and costs show a high cost and high price scenario.

To assess the effect of this change on area, we calculate simple short run supply elasticities to illustrate the effect of the change in the gross margin on the area planted.

The supply elasticities are calculated in two ways:

- The first was constructed by examining changes in relative gross margins versus changes in relative areas under alternative non-irrigated COP crops in the following crop year (assuming an adaptive model). The supply elasticity is expressed in terms of the % change in the durum wheat share of the total non-irrigated COP area divided by the % change in the relative gross margins for durum wheat and other non-irrigated COP crops the previous year. In the year in which the policy changed, we alter the relative gross

margin to take account of the change in the level of support following the policy change as farmers knew of this change in advance and this would have helped inform their decision making. This measure of the elasticity is used as it takes into account competition from other crops and the effect of set aside on the land area.

- The second, an alternative, is to calculate a supply elasticity just for durum wheat, irrespective of changes to alternative crops. This is calculated as the % change in area of durum wheat divided by the % net margin change for durum wheat.

These elasticities assume that prices are exogenously determined. This assumption is used as the EU is consistently a net importer of durum wheat and hence it is import prices that are determining EU prices.

The elasticity calculations are backed up by the questionnaire responses. As part of the questionnaires farmers were asked how they would respond to a change in support in a series of "what if" questions. These were phrased as follows "What would be the effect on the area you plant with durum wheat if the level of the payment (the quality premium plus coupled payment) which is tied to the production of durum wheat was changed?"

In **Italy**, in the absence of coupled support, for durum wheat the gross margin falls to €24 per hectare at 2006 prices and costs and €108 per hectare at 2008 prices and costs. The change in margins for the competing crops are shown in Table 4.15.

Table 4.15: Italy The counterfactual case, Gross Margins (€per hectare)

	Prior to reform (3 yr average)	Post Reform		Counterfactual	
		2006	2008	2006 prices	2008 prices
Durum Wheat					
Variable Cost	410	511	668	511	668
Revenue from crop	390	535	776	535	776
Coupled Aid	418	92	92		
Total Revenue	809	627	868	535	776
Gross Margin	399	116	200	24	108
Common Wheat					
Variable Cost	485	350	461	350	461
Revenue from crop	381	407	724	407	724
Coupled Aid	226	54	54		
Total Revenue	608	461	777	407	724
Gross Margin	122	111	316	58	263
Sunflower					
Variable Cost	287	442	588	442	588
Revenue from crop	445	407	600	407	600
Coupled Aid	223	54	54		
Total Revenue	667	460	654	407	600
Gross Margin	380	18	66	-35	12

Source: FADN, LMC

While the durum wheat area in traditional areas fell following the reform, there was little change in the area under alternative COP crops. The non-irrigated agricultural area (defined as the durum wheat, common wheat, sunflower and set aside area) fell from an average of 2.3 million hectares in the three years prior to the reform to an average of 2.0 in the two years following the reform. The non-irrigated agricultural area only rose again when the gross

margins rose in 2008. Durum wheat as a proportion of the non-irrigated area fell from 74% prior to the reform to an average of 69% in the two years following the reform (Table 4.16)

Comparing the relative change in durum wheat area with the change in the difference in the net margin reveals a positive relationship; as the difference in the net margin rises (i.e., the margin of durum wheat increases relative to the alternative crops) so the proportion of durum wheat as a share of the non-irrigated area rises as shown in Table 4.16 and Diagram 4.12. Similarly, in examining the simple durum wheat elasticity as the net gross margin rises so does the area under durum wheat. As the area of alternative crops is not observed to have increased, it is this second relationship that we use to calculate the change in area resulting from the counterfactual case.

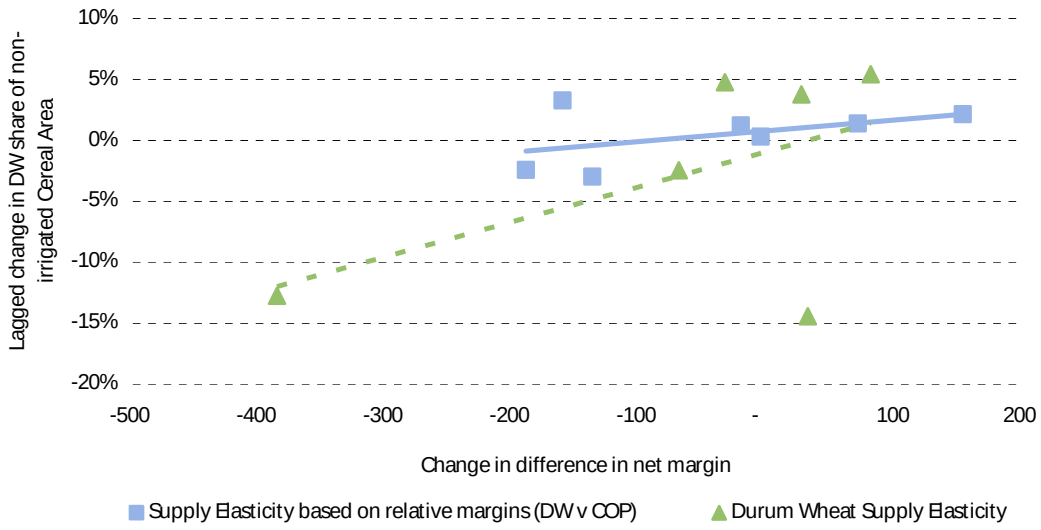
Table 4.16: Italy, Changes to Areas and Gross Margins

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non-irrigated area ('000 ha)	2,324	2,308	2,405	2,238	2,291	2,047	2,013	2,033	2,100
Durum Wheat Area ('000 ha)	1,634	1,643	1,705	1,663	1,743	1,491	1,301	1,372	1,472
Durum wheat as % non-irrigated	70%	71%	71%	74%	76%	73%	65%	67%	70%
Durum Wheat Gross Margin (€ per ha)	460	488	419	386	420	33	116	142	429
Difference in gross margin from durum wheat (€per ha)									
Durum wheat minus Common wheat	155	179	235	436	197	14	5	-26	21
Durum wheat minus sunflower	367	125	-33	48	70	-126	98	154	367
Change in difference (weighted average)		-161	-20	156	-137	-189	73	-4	104

Source: Eurostat, LMC based on Tables 4.10,,4.11 and 4.15

The simple elasticity based on the change in gross margin and change in durum wheat area suggests that a 10% change in the gross margin results in a 1.8% change in the area under durum wheat. Recalculating the change in gross margin in the absence of coupled support suggests that the gross margin would fall by €92 per hectare. Assuming 2008 prices and costs this reduces the gross margin by 21% implying a 3.1% reduction in the planted area. In the case where prices and costs fall back to 2006 levels, then the traditional area under durum wheat falls by 5.5%. This response is relatively small, partly because the level of coupled support is relatively low. The difference in support between durum wheat and other COP crops is the €40 per hectare quality premium as other COP crops also receive the Article 69 support. The calculated reduction in area is less than that reported by the farmers in the questionnaires. When asked about changes in the level of durum wheat support, farmers responded that if the support was completed removed the area under durum wheat would fall by more than 30%.

Diagram 4.12: Italy, supply elasticities



Note: the net margin is calculated as the durum wheat gross minus the weighted average of the alternative crops net margin (common wheat and sunflower).

In **Spain**, in the traditional areas, we see the clearest evidence of a switch in crops following the reform. In Andalucia, the case study region, the area under common wheat increases at the expense of durum wheat. Across the whole of the traditional areas, in the non-irrigated areas, the proportion of the area accounted for by durum wheat falls from 65% in the three years prior to the reform, to an average of 52% in the subsequent years (Table 4.17).

Table 4.17: Spain, Changes to Areas and Gross Margins

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non-irrigated area ('000 ha)	1,465	1,462	1,462	1,428	1,441	1,394	1,131	1,028	1,002
Durum Wheat Area ('000 ha)	867	883	924	912	942	909	613	496	528
Durum wheat as % non-irrigated	59%	60%	63%	64%	65%	65%	54%	48%	53%
Durum Wheat Gross Margin (€ per ha)	551	614	539	635	581	624	328	478	630
Durum wheat minus Common wheat	98	277	153	242	61	344	-48	-40	-150
Durum wheat minus sunflower	218	235	177	258	233	202	119	403	512
Change in difference (weighted average)	0	66	-77	83	-64	-97	-170	197	29

Source: Eurostat, LMC based on Tables 4.10,,4.14 and 4.18

In the absence of coupled aid, the gross margin for durum wheat falls by €162 per hectare, for common wheat the fall is €49 per hectare and sunflower €56 per hectare as revealed by Table 4.18.

Table 4.18: Spain The counterfactual case, Gross Margins (€per hectare)

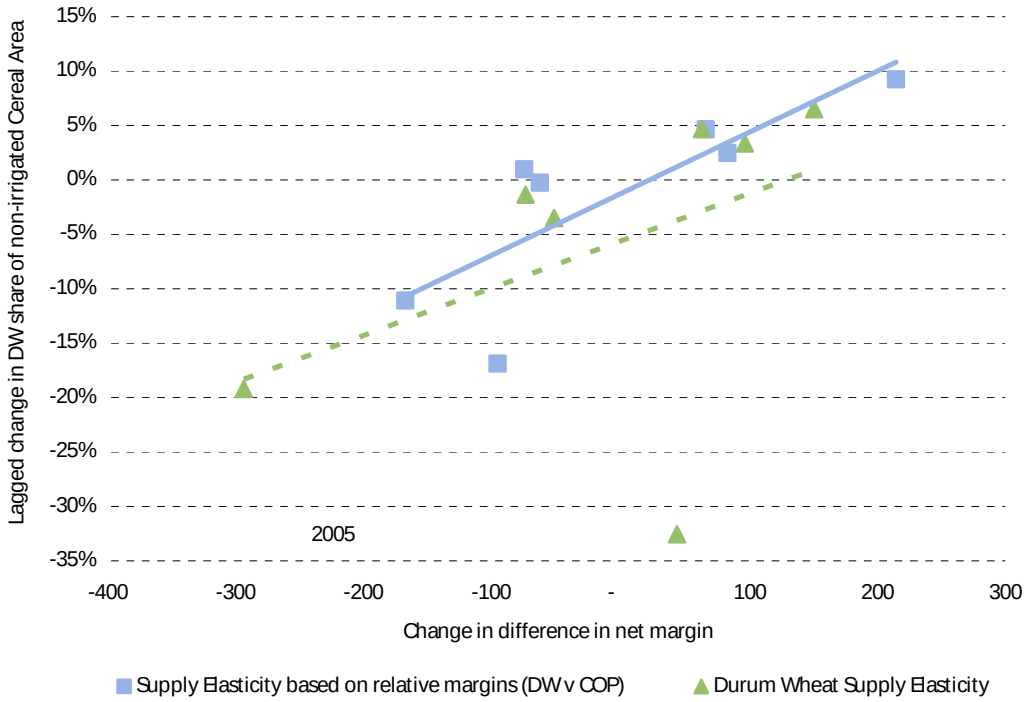
	Prior to reform (3 yr average)	Post Reform		Counterfactual	
		2006	2008	2006 prices	2008 prices
Spain					
Durum Wheat					
Variable Cost	238	242	314	242	314
Revenue from	395	409	784	409	784
Coupled Aid	432	162	161		
Total Revenue	827	571	944	409	784
Gross Margin	589	329	630	167	469
Common					
Variable Cost	143	161	214	161	214
Revenue from	353	488	945	488	945

Coupled Aid	186	49	49		
Total Revenue	540	537	994	488	945
Gross Margin	397	376	780	327	731
Sunflower					
Variable Cost	244	250	323	250	323
Revenue from	383	403	384	403	384
Coupled Aid	244	56	56		
Total Revenue	627	460	441	403	384
Gross Margin	383	210	118	153	62

Source: FADN, LMC

Diagram 4.13 presents the trend lines which are used for the elasticities. Given the switching between crops, we use the first measure of elasticity to calculate the effect of the counterfactual case. This elasticity is based on the change in difference in the change of the net margin between durum wheat and its main competing crops and the change in durum wheat's share of the non-irrigated area. The elasticity suggests that a €100 change in the net margin leads to a 7% change in durum wheat's proportion of the non-irrigated area. Assuming no change in the non-irrigated area, this suggests that the durum wheat planted area would fall by 7% at 2008 price and cost levels and 20% at 2006 levels. This latter observation is less than that reported by interviewed farmers. When asked about changes in the level of support the majority of farmers responded that if the support was completely removed their planted area would fall by more than 30%.

Diagram 4.13: Spain, supply elasticities



Note: the net margin is calculated as the durum wheat gross minus the weighted average of the alternative crops net margin (common wheat and sunflower).

In **Greece**, while the durum wheat area fell following the reform, there was little change in the area under alternative COP crops. The durum wheat area as a proportion of the total area fell from 85% of the non-irrigated area to 78% of the area following the reform (Table 4.19). As the area of alternative crops does not change, as with Italy, we use the simple durum wheat elasticity to calculate the effect of the counterfactual case.

Table 4.19: Greece, Changes to Areas and Gross Margins

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non-irrigated area ('000 ha)	849	866	861	839	837	830	770	730	747
Durum Wheat Area ('000 ha)	660	691	704	696	712	711	626	561	575
Durum wheat as % non-irrigated	78%	80%	82%	83%	85%	86%	81%	77%	77%
Durum Wheat Gross Margin (€ per ha)	346	398	345	354	402	360	46	35	458
Difference in gross margin from durum wheat (€per ha)									
Durum wheat minus Common wheat	200	153	136	283	274	194	94	35	129

Source: Eurostat, LMC based on Tables 4.10,,4.14 and 4.18

Under the counterfactual case the gross margin for durum wheat falls by €148 per hectare at 2006 values and €138 per hectare at 2008 values, the difference being the change in the Article 69 payment over this period. In the case of 2006 prices and costs the gross margin becomes negative (Table 4.20).

Table 4.20: Greece The counterfactual case, Gross Margins (€per hectare)

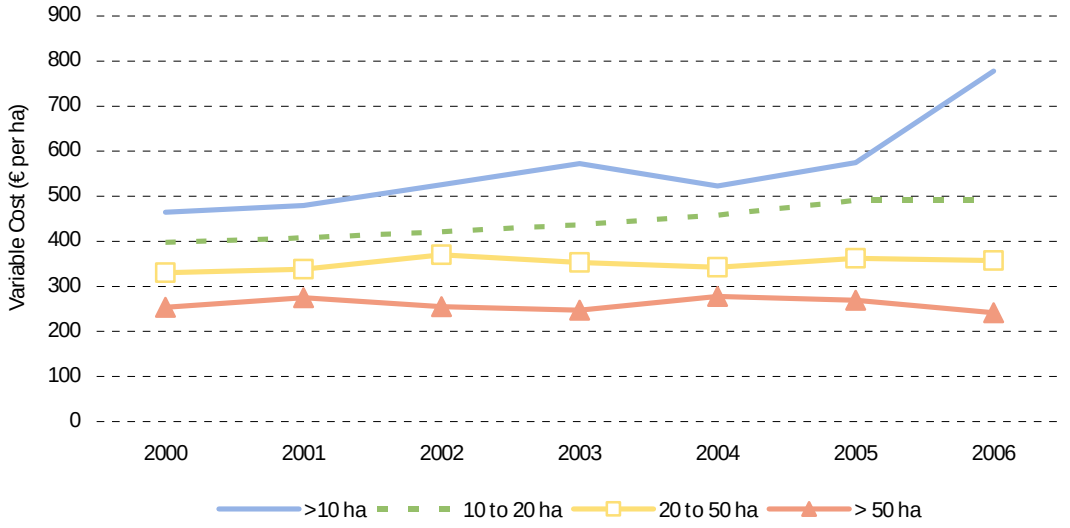
	Prior to reform (3 yr average)	Post Reform		Counterfactual	
		2006	2008	2006 prices	2008 prices
Greece					
Durum Wheat					
Variable Cost	393	376	457	376	457
Revenue from crop	266	275	777	275	777
Coupled Aid	473	148	138		
Total Revenue	739	422	915	275	777
Gross Margin	346	46	458	-101	320
Common Wheat					
Variable Cost	405	424	515	424	515
Revenue from crop	377	376	844	376	844
Coupled Aid	153	0	0		
Total Revenue	530	376	844	376	844
Gross Margin	125	-48	329	-48	329

Source: FADN, LMC

With a negative gross margin production would be expected to cease, although a number of caveats need to be made:

- The FADN data only show average costs, for some producers the gross margin would remain positive and hence production would continue;
- Where the gross margin is negative either production would cease and the land reverts to fallow (either being abandoned or maintained in order to ensure cross-compliance and the payment of the single farm payment) or it is planted with alternative crops;
- Production costs are found to be highest for the smallest farmers as shown in Diagram 4.14. The diagram shows, from FADN data, variable costs for durum wheat farms according to farm size. As farm size increases so variable costs decline. Hence a negative gross margin would be expected to encourage the consolidation of farms: the average farm size increases, average costs decline and gross margins rise.

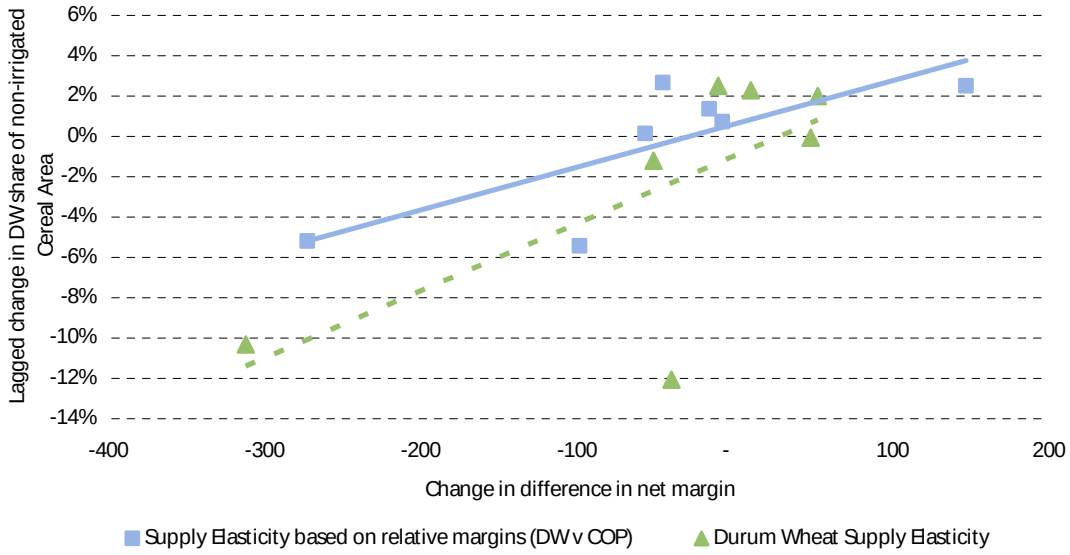
Diagram 4.14: Greece, FADN Variable Costs by Farm Size (€ per hectare)



Source: FADN

The simple short run elasticity based on the change in gross margin and change in durum wheat area suggests that a 10% change in the gross margin results in a 1.7% change in the area under durum wheat. This suggests that in the absence of coupled support the durum wheat planted area would 4% lower if 2008 price and cost levels were maintained and 34% at 2006 levels (Diagram 4.15). This latter observation is in line with the questionnaire responses, 50% of the respondents stated that removing the support would reduce production by over 30%. An interesting part of the Greek questionnaire responses is that 34% of respondents indicated that totally removing the support would not change the amount of durum wheat that would be planted, this points to the lack of alternatives faced by a number of producers.

Diagram 4.15: Greece, supply elasticities



In **France,** with full decoupling the durum wheat gross margin fall by €208 per hectare. At 2006 prices and costs this results in a negative gross margin, the consequences of which are discussed above for Greece (Table 4.21).

Table 4.21: France The counterfactual case, Gross Margins (€per hectare)

	Prior to reform (3 yr average)	Post Reform		Counterfactual	
		2006	2008	2006 prices	2008 prices
France					

Durum Wheat					
Variable Cost	634	557	683	557	683
Revenue from crop	537	434	1,304	434	1,304
Coupled Aid	558	208	208		
Total Revenue	1,095	641	1,511	434	1,304
Gross Margin	461	85	828	-123	620
Common Wheat					
Variable Cost	495	443	541	443	541
Revenue from crop	776	663	1,051	663	1,051
Coupled Aid	312	79	79		
Total Revenue	1,088	742	1,130	663	1,051
Gross Margin	593	299	590	220	511
Sunflower					
Variable Cost	374	475	689	475	689
Revenue from crop	412	378	805	378	805
Coupled Aid	295	74	74		
Total Revenue	707	451	878	378	805
Gross Margin	333	-24	190	-97	116

Source: FADN, LMC

Following the reform, durum wheat's proportion of non-irrigated land does not change (averaging 40% of the non-irrigated area). (Table 4.22)

Table 4.22: France, Changes to Areas and Gross Margins

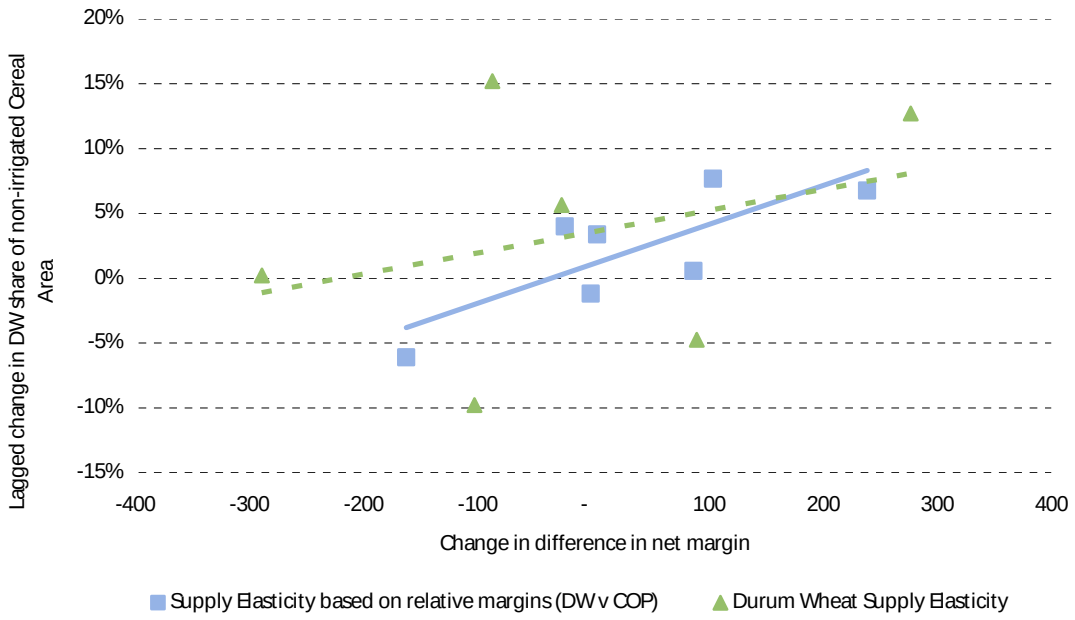
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non-irrigated area ('000 ha)	693	657	694	669	716	727	699	677	680
Durum Wheat Area ('000 ha)	245	235	265	252	291	307	277	278	280
Durum wheat as % non-irrigated	35%	36%	38%	38%	41%	42%	40%	41%	41%
Durum Wheat Gross Margin (€ per ha)	235	512	601	511	482	376	85	186	828
Difference in gross margin from durum wheat (€per ha)									
Durum wheat minus Common wheat	-229	52	102	-84	-177	-158	-215	-71	238
Durum wheat minus sunflower	-137	54	-14	333	384	44	109	124	639
Change in difference (weighted average)	0	239	-4	103	-26	-165	2	86	401

Source: Eurostat, LMC based on Tables 4.10,,4.14 and 4.18

Comparing the relative change in durum wheat area with the change in the difference in the net margin reveals that as the net difference increases (i.e., as the margin of sunflower and common wheat increases relative to durum wheat) so the relative area under durum wheat declines (Diagram 4.16).

Using this adaptive supply curve that a €100 change in the net margin leads to a 4% change in durum wheat's proportion of the non-irrigated area. Assuming no change in the non-irrigated area, this suggests that with full decoupling the durum wheat planted area would fall by 3% at 2008 price and cost levels and 17% at 2006 levels. That the fall is not larger is due to the poor gross margin for sunflower. A comparison with the questionnaire responses is not possible as the selected area was a non-traditional area, where specific aid to durum wheat had already been removed.

Diagram 4.16: France: supply elasticities



Note: the net margin is calculated as the durum wheat gross minus the weighted average of the alternative crops net margin (common wheat and sunflower).

Area change resulting from an ending of durum wheat support

The impact of reducing the level of coupled support to zero is not only different between countries, it also alters according to the level of underlying market prices and costs. Using the short term supply elasticities for the traditional areas calculated above, we estimate changes to area in traditional areas at two price and cost levels: 2006 prices and costs which are representative of prices and costs that existed prior to the adoption of the reform and 2008 prices and costs show a high price and cost scenario.

The changes to area are compared to the traditional area in 2008. As shown in Table 4.23, if prices and costs remained at 2008 levels, then the total traditional area would fall by 4% with the largest falls in Spain. At 2006 price and cost levels, under the assumptions given above the traditional area falls by 16% from 2008 levels.

Assuming yields remain at 2008 levels, under the counterfactual case, production would fall by 4% at 2008 prices and costs and 18% at 2006 prices and costs.

The non-traditional areas are not affected to the same extent in the counterfactual case as there currently is not specific support remaining for durum wheat. In the case of France and Spain, full decoupling would affect all the cereal crops to the same degree as the remaining 25% coupled support applies across crops. The same is true of the Article 69 support in Italy. In Greece, the alternative crops are already fully decoupled, while the Article 69 support would be removed for durum wheat in the traditional areas. However, non-traditional areas account for less than 1% of the total Greek durum wheat area.

Table 4.23: Change in area and production, counterfactual case

	Area (2008) ('000 ha)	2008 prices and costs % change	2008 prices and costs ('000 ha)	% change	2006 prices and costs ('000 ha)
Area					
France	280	-3%	273	-17%	225
Greece	575	-4%	552	-34%	365
Italy	1,472	-3%	1,428	-5%	1,352
Spain	528	-8%	486	-20%	387

Total Production		2,855	-4%	2,739	-18%	2,329
	Yield (2008) (t/ha)	Production (2008) ('000 tonnes)		('000 tonnes)		('000 tonnes)
France	3.31	928		902		745
Greece	2.61	1,499		1,440		952
Italy	2.32	3,419		3,317		3,139
Spain	2.80	1,477		1,360		1,082
Total		7,323		7,018		5,919

Source: LMC

4.1.4 Changes in farm size

Eurostat data for durum wheat producers enable us to make a comparison of farm sizes between the four case study MS that are the focus of this evaluation. In addition, in the case of Italy and France they allow us to compare changes that have occurred following the change in regime.

Table 4.24 reveals the change in size by year (by area and number of farms respectively), starting in 2002/03 prior to the introduction of the reform. Data for the period post reform are only available for Italy and France.

The key conclusions of this analysis are that, in France, the total number of farms increases post reform. In terms of the dynamics of each farm size class, the data reveal a decrease in the number of small farms and an increase in larger farm sizes. In Italy, the data show a fall in all farm sizes in the years following the implementation of the 2003 CAP measures.

Table 4.24: Area and number of durum wheat farms by size class (hectares)

	2002/03		2004/05		2006/07		Change 2006/07 on 2004/05	
	Area ('000 ha)	No of farms	Area ('000 ha)	No of farms	Area ('000 ha)	No of farms	Area ('000 ha)	No of farms
France								
< 2	0.2	170	0.2	170	0.1	110	-53%	-35%
2 to 5	1.1	450	1.6	630	1.1	480	-29%	-24%
5 to 10	3.7	920	3.1	670	2.6	710	-16%	6%
10 to 20	8.4	1,410	10.8	1,580	7.6	1,060	-30%	-33%
20 to 30	13.6	1,550	14.6	1,520	13.3	1,610	-9%	6%
30 to 50	30.1	2,610	37.0	3,000	30.7	2,670	-17%	-11%
50 to 100	96.8	5,620	105.5	5,590	109.7	6,140	4%	10%
100+	210.3	6,480	246.1	7,310	298.8	9,330	21%	28%
Total	364.3	19,210	418.9	20,470	463.9	22,110	11%	8%
Greece								
< 2	16.7	18,780	16.8	19,710				
2 to 5	83.8	42,190	83.6	42,240				
5 to 10	135.4	36,990	139.1	38,520				
10 to 20	156.0	25,070	164.6	24,970				
20 to 30	98.7	8,860	96.5	8,800				
30 to 50	109.7	6,200	109.5	6,240				
50 to 100	39.5	1,920	45.4	1,990				
100+	26.5	470	25.0	430				
Total	666.1	140,480	680.4	142,900				
Italy								
< 2	60.6	69,540	40.8	50,100	46.7	55,760	-23%	-20%
2 to 5	175.6	84,600	159.5	83,330	128.8	69,230	-27%	-18%
5 to 10	239.7	59,400	210.5	55,450	185.3	52,000	-23%	-12%
10 to 20	330.8	42,670	282.7	39,180	253.9	37,730	-23%	-12%
20 to 30	214.6	17,260	160.9	14,430	170.4	14,640	-21%	-15%
30 to 50	283.8	14,790	226.3	13,190	262.6	15,730	-7%	6%
50 to 100	274.5	9,360	211.2	8,140	205.4	8,180	-25%	-13%
100+	328.3	5,080	268.4	4,410	212.7	3,780	-35%	-26%
Total	1,907.9	302,700	1,560.2	268,230	1,465.8	257,050	-23%	-15%
Spain								
< 2	1.3	1,240	1.1	1,550				
2 to 5	6.6	5,210	8.1	5,800				
5 to 10	18.3	5,760	23.0	8,090				
10 to 20	45.5	8,460	41.3	7,640				
20 to 30	51.1	5,450	43.6	5,270				
30 to 50	76.3	5,980	66.4	5,350				
50 to 100	163.1	7,350	159.7	7,110				
100+	620.3	10,070	585.4	9,360				
Total	982.6	49,520	928.5	50,170				

Source: Eurostat

Analysis of FADN data on durum wheat specialists confirms the increasing size of farms for Italy, Greece and Spain (as revealed in Table 4.25). However, the farm size in the FADN sample in France falls. While this seems to contradict the findings of our preceding analysis, the likely explanation for this discrepancy is that the French FADN sample contains a relatively small number of farms and changes in the farms that are sampled every year can lead to results that do not reflect the behaviour of the larger population of durum wheat farms.

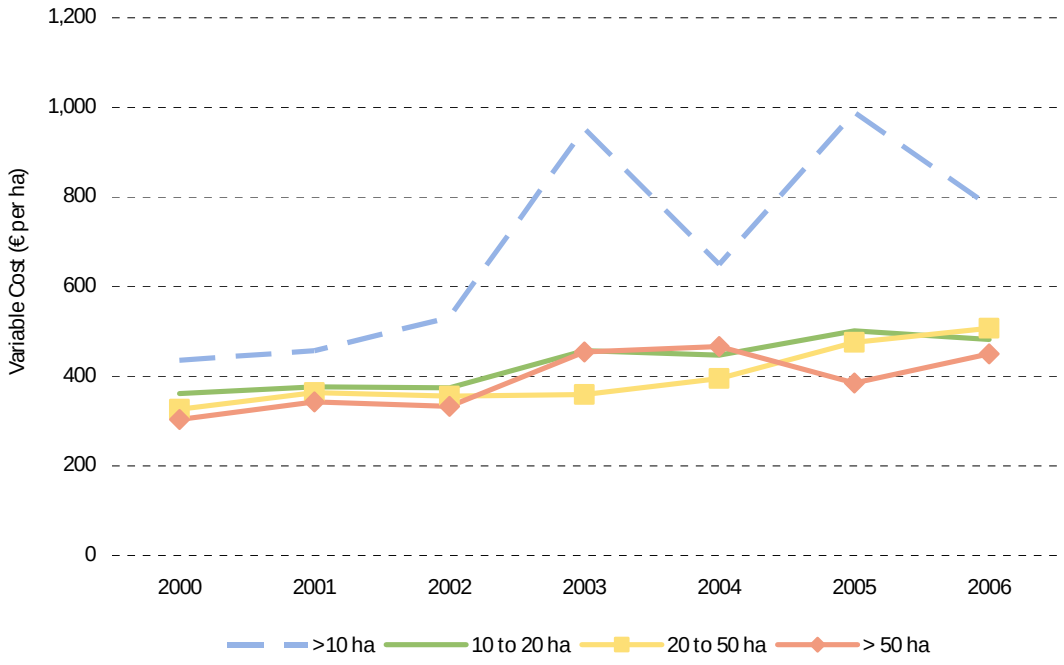
Table 4.25: FADN: durum wheat specialists farm size (hectares)

	2000	2001	2002	2003	2004	2005	2006
France							
Area	98.9	89.8	111.7	102.7	93.9	67.9	91.1
DW % Area	74%	68%	73%	72%	70%	68%	69%
Italy - Centre							
Area	19.9	29.2	34.0	38.6	33.3	39.2	44.1
DW % Area	75%	73%	73%	73%	74%	71%	70%
Italy - South							
Area	23.1	26.9	27.4	32.6	32.0	31.8	30.1
DW % Area	80%	80%	82%	82%	83%	82%	82%
Spain							
Area	55.0	41.1	41.8	55.0	64.1	69.7	76.2
DW % Area	69%	69%	74%	78%	77%	79%	80%
Greece							
Area	19.2	20.0	20.3	25.2	24.0	25.1	28.6
DW % Area	88%	88%	87%	87%	88%	88%	89%

Source: FADN

This trend towards larger farm sizes was apparent prior to the reform and has continued. In the longer term, it reveals an important dynamic as larger farm sizes are found to have lower production costs. An analysis of the FADN data reveal that the larger the farm the lower costs across countries. In Italy, for instance, farms above 10 hectares are found to have lower costs than farms under 10 hectares as shown in Diagram 4.17. This dynamic holds across countries.

Diagram 4.17: Italy production costs by farm size



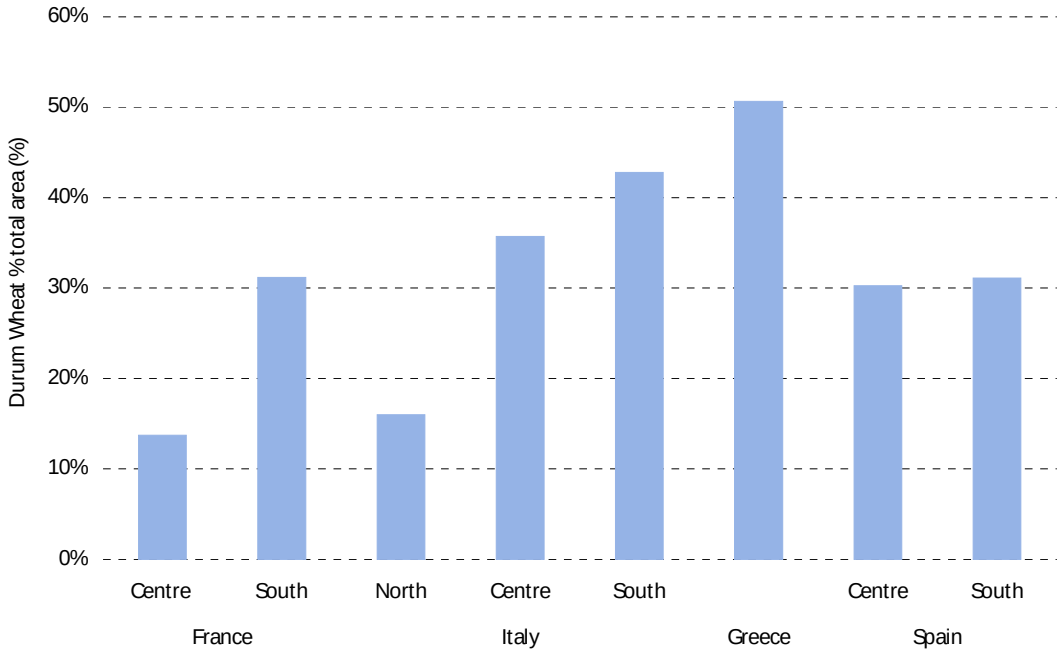
Source: FADN

4.1.5 Degree of specialisation

Examining the FADN data for all durum wheat farms gives an impression of how important durum wheat area is as a proportion of the area farmed. These data reveal that the average area under durum wheat in France was 24% of the total area, followed by 45% in Greece, 31% in Italy, 33% in Spain. This analysis can be further refined by analysing trends in the traditional as opposed to non-traditional regions. This is shown in Diagram 4.18. In France and Italy the

proportion of the area is higher in the traditional areas (France-South, Italy Centre and South) than in the non-traditional areas. In Spain there was no difference between traditional and non-traditional areas. These results of this analysis are similar to the finding of the questionnaires: in France, in a non-traditional area, the farm area under durum wheat was under 10%, while the area under durum was over 30% in Spain and between 60% and 70% in Greece and Italy (South).

Diagram 4.18: FADN data, area under durum wheat by region



Examining trends over time from the FADN data reveal that the proportion of the farm area under durum wheat fell in Greece and Italy, but increased marginally in Spain and France. The results of this analysis are shown in Table 4.26. It is important to point out, however, that these data underestimate the extent of change in area. This is because we are only considering a group of farmers who are growing durum wheat, if the planting of durum wheat was abandoned the farmer would not be considered in the sample.

Table 4.26: FADN: farm area under durum wheat (%)

Country	Area	2000	2001	2002	2003	2004	2005	2006	Post Reform change on previous 3 years
France	Centre	11.1%	11.0%	12.3%	16.1%	15.3%	14.6%	15.2%	-0.7%
	South	28.9%	28.3%	29.6%	30.9%	33.0%	33.8%	33.2%	2.0%
Italy	North	19.7%	27.0%	18.0%	16.7%	12.9%	14.3%	11.5%	-21.7%
	Centre	38.3%	36.8%	39.3%	36.2%	38.4%	31.7%	30.8%	-13.2%
	South	42.5%	43.7%	46.7%	44.4%	44.6%	40.3%	36.7%	-14.9%
Greece		48.4%	50.9%	51.2%	52.5%	52.4%	53.3%	45.4%	-13.9%
Spain	Centre	31.1%	30.1%	28.8%	30.6%	31.7%	28.5%	31.5%	3.9%
	South	29.0%	28.2%	31.7%	32.7%	31.6%	32.5%	33.5%	3.8%

Source: FADN

4.1.6 Labour use

The FADN data also give an indication of the amount of labour involved in durum wheat production in the traditional areas. As shown in Table 4.27, this ranges from over 100 hours per hectare in Greece to just 20 hours per hectare in France. Importantly, analysing how labour use

has changed following the reform the data suggest lower labour use in all countries. However, this may just represent a change in the FADN sample.

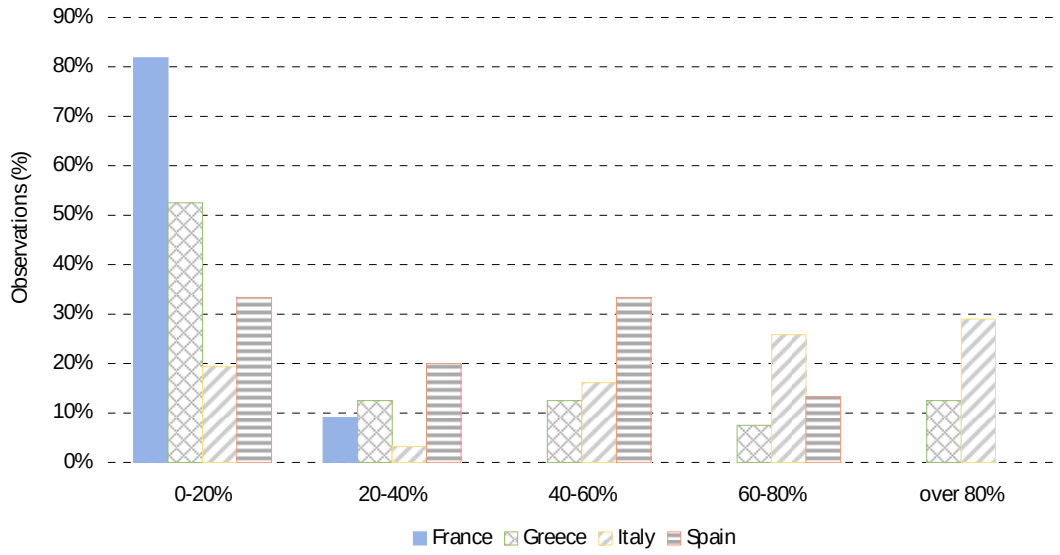
The questionnaires provide further insights into the use of labour for durum wheat production. First, the questionnaire responses suggest that durum wheat production accounts for 11% of labour use in France, 31% in Greece, 52% in Italy; and 31% in Spain as shown in Diagram 4.19. Second, in most cases, respondents in the case study areas stated that labour use in durum wheat production had not changed over the last three years.

Table 4.27: FADN: Unpaid labour, hours per hectare

	2000	2001	2002	2003	2004	2005	2006
France	29	29	19	21	21	29	21
Greece	129	121	130	100	93	90	71
Italy	91	98	67	61	62	54	60
Spain	39	42	41	50	50	45	42

Source: FADN

Diagram 4.19: Questionnaire responses: Importance of durum wheat for labour use



4.1.7 Changes in the structure of production

Changes in input use

An indication of the change in structure of production can be gained by analysing changes in input use. The results of the questionnaires give some indication as to the changes. Table 4.28 reveals the proportion of farmers citing no change when asked about the change in input use over the last three years. In Italy, Greece and Spain, the overwhelming response is that there has been no change in input use (the same is true of responses to the change in inputs for the alternative crops). In France, there appears to have been an increase in input use, however, these the responses were partly due to a misunderstanding in the translation of the question, with responses reflecting the change in input cost rather than the intensity of use.

Table 4.28: Questionnaire responses, % farmers citing no change in input use

	France	Greece	Italy	Spain
Seed	33%	68%	90%	86%
Fertiliser	33%	60%	83%	64%
Pesticides	33%	73%	85%	85%
Herbicides	33%	73%	85%	85%

Irrigation	25%	82%	100%	92%
Labour	43%	91%	92%	86%

Source: Questionniares

Contracting of services

In terms of the contracting out of services, close to 80% of the questionnaire respondents in Italy and France did not contract out services. A higher proportion in Greece and Spain did. In these latter cases, harvesting and threshing were the most common services contracted out.

Investment

According to the questionnaire respondents, the investment in farm machinery increased in around one third of cases over the past five years. The highest level of increased investment was in Spain. The most common investment was in a tractor.

Irrigation

While durum wheat is clearly grown on non-irrigated land, there was some evidence, particularly from Greece that there had been an increase in the use of irrigation over the past three years. This is consistent with data from the Greek Ministry of Agriculture which suggest that the durum wheat irrigated area has risen from 5.2% in 2003 to 6.8% in 2007. This rise in irrigated area has occurred as areas dedicated to other crops in previous years (e.g. maize, cotton, etc.) has been used to produce durum wheat.

4.1.8 Conclusion

Q1.1 and Q2.1. To what extent have the CAP measures supporting durum wheat ensured the maintainance of durum wheat production in traditional production areas, led to structural change and changes in the geographical distribution of durum wheat production?

In response to the reforms, changes in durum wheat area and geographical distribution of production in traditional areas and non traditional areas have been markedly different between countries. Among the five largest producers (Italy, Greece, Spain France and Portugal) the area under durum wheat fell by 20% following the reform from an annual average of 3.8 million hectares to 3.0 million hectares. This fall in area was partially compensated by rises in area for common wheat, rapeseed, barley and set-aside, while the total COP area also fell. Of the other EU-15 producers, the area fell in the UK, but rose in Germany and Austria.

The effect of the reform on production has been less severe. Average annual production in the EU-27 was 7% lower following the reform, although if 2008 is removed, when higher prices led to increased plantings, production was 9% lower. Average production fell by 13% in traditional regions and areas rose by 64% in non-traditional regions. Post-reform the traditional area accounts for 85% of production, compared to 91% of production pre-reform. The reforms have therefore not ensured the maintenance of production at the levels that existed prior to the reforms in traditional areas.

Of the largest producers:

- In France, there has been little change in area or production in traditional areas after 2006 (6% fall), although in non-traditional areas production has increased by 60%. In the traditional areas, the area under production has increased in Midi-Pyrénées, but fell in Provence-Alpes-Côte d'Azur and Languedoc-Roussillon. The ranking of gross margins between durum wheat and the main competing COP crops does not change following the introduction of the regime change or under the counterfactual case, although the French FADN sample is the smallest of the case study countries. However, in the absence of coupled support, the gross margin would become negative if prices had remained at 2006 levels. A negative gross margin would imply either that production would cease and the land reverts to fallow (either being abandoned or maintained in order to ensure cross-compliance and the payment of the single farm payment) or it is

planted with alternative crops. However, production costs are found to be highest for the smallest farmers and hence a negative gross margin would encourage the consolidation of farms: as the average farm size increases so average costs decline and gross margins rise.

- In Italy, the area under durum wheat has fallen post 2004, however yields have risen and the net effect as been little change in average durum wheat production in traditional areas following the introduction of the reforms. The change in measures has ensured the maintenance of the area rather than an expansion of the area. At a regional level, the non-traditional area has increased, albeit from a low base, since the adoption of the reform, while the traditional area fell by 17%. Overall, the UAA has declined post reform. The ranking of gross margins between durum wheat and the main competing COP crops has remained unchanged. Under the counterfactual case, gross margins remain positive and the ranking of crops does not change. The level of coupled support in Italy is the lowest of the major durum wheat producers and full decoupling has the least impact.
- In Greece, the area under durum wheat has fallen, yields have been maintained and hence production has fallen. At the same time, there has been some increase in the area under common wheat. The ranking of gross margins between durum wheat and the main competing COP crops has remained unchanged. In the absence of support, the gross margin would become negative if prices had remained at 2006 levels.
- In Spain, the area under durum wheat has fallen. Yields have been maintained and hence production has fallen. The non-traditional area fell by 38%, while the traditional area fell by 44%. In the traditional areas, the area under durum wheat fell in all regions. The changing of the aid regime has altered the ranking of gross margins between durum wheat and common wheat and hence the area under common wheat has increased relative to durum wheat. In the absence of coupled aid the ranking of crops does not change. The gross margin remains positive under both 2006 and 2008 prices and costs.
- In Portugal, following the introduction of the reforms, the area under durum wheat collapsed from over 150,000 hectares in 2004 to under 5,000 hectares. This fall was compensated for by an increase in common wheat production. The fall occurred as the gross margins for common wheat rose above that of durum wheat and in the absence of aids for durum wheat farmers switched production (Table 4.7).

The examination of the counterfactual case enables us to assess the extent that the measures have supported production. In the absence of CAP measures, the effect on the area planted (and hence production) is very much dependent upon the underlying level of prices. While the effect on individual countries would be different, with the countries maintaining the highest amount of coupled aid having the most to lose, overall our analysis points to the area falling by a further 4% in the absence of support (assuming in prices and costs remain at 2008 levels), while the area would fall by 18% if prices reverted to 2006 levels.

Structural change in traditional production areas has been assessed in terms of farm size, area under durum wheat and the intensity of input use. Overall, these data suggest that the reform of the CAP measures has led to little structural change and trends that were apparent prior to the introduction of the reform have continued following the reform. However, the post reform period is only three years, a short time period over which to evaluate structural change:

- Eurostat data reveal a general tendency towards an increasing farm size since 2000. This trend has concluded following the reforms and not been altered by the reforms, although there is only limited data to support this conclusion.
- In terms of the area under durum wheat, for farmers producing durum wheat the evidence is mixed. The FADN data suggest that there has been structural change in the sense that the durum wheat area as a proportion of total area has fallen in Italy and Greece following the reforms. However, the proportion remains unchanged in France

and Spain. This underestimates structural change to the extent that some farmers have stopped growing durum wheat and consequently have fallen out of the FADN sample. In addition, the FADN sample changes each year.

- The results of the questionnaires reveal that there has been no change in the intensity of input use following the reforms. In terms of labour, most questionnaire respondents stated that labour use in durum wheat production had not changed over the last three years. In terms of investment in farming, the level of investment has either increased or been maintained in over 80% of farms surveyed.

Evaluation question 1.2: Effects on incomes

4.2 Farmer income

In the discussion that follows, income focuses on farm income. Income is defined in two ways: first, we consider the income from one hectare of durum wheat; and second, using FADN data, we examine income across the whole of the farm enterprise. Income from the measures supporting durum wheat is presented as a proportion of total income. This share is calculated before and after the reform to establish the extent and direction of the change. This is then compared to the coupled support that is available to the alternative crops.

An analysis of the FADN data for durum wheat specialists is used to determine farmers' income. From this data it will then be possible to determine the proportion of income that is from the coupled and decoupled aid and determine how this has changed over time. This is backed up by data from the questionnaires.

The judgement criteria, indicators and data sources used in this discussion are listed in Table 4.29.

Table 4.29: Question 1.2 judgement criteria, indicators and data sources

Judgement criteria	Indicator	Data Sources	
		Quantitative	Qualitative
Importance of aids to total income	Revenue split between prices, coupled and decoupled payments	FADN/Case studies	Farmers' questionnaires
	Importance of coupled payments to revenue	FADN/Case studies	
Importance of durum wheat for labour use	Labour devoted to durum wheat and implicit wage	Eurostat/FADN/Farmers' questionnaires	Case studies
The importance of coupled payments in the overall rankings of gross margins of DW vs. other COP crops.	Division of incomes into market sales, decoupled payments and coupled payments	FADN/Case studies	Farmers' questionnaires

4.2.1 Importance of support to total income

Total Revenue

Analysis of the whole FADN durum wheat sample, both for specialists and non-specialists, allows us to establish total income from farming. For each country, we have calculated the total revenue per farmed hectare and the amount of that revenue that is contributed by durum wheat (i.e., durum wheat related income divided by the total farmed area) for the period pre- and post reform. Total revenue is split into two components, crop revenue from the sale of production and revenue from EC support. The EC support also includes coupled aids to other crops that farmers are growing. As we are interested in total income from farming the post reform income includes the decoupled support. This aid is not attributed to durum wheat production but is revenue to the whole farm enterprise. These estimates were then compared

to establish the extent and the direction of the change that may have occurred in average revenue per hectare following the 2003 reform. The results are presented in Table 4.30. The analysis is limited to the extent that the FADN sample changes each year.

Table 4.30: FADN: Area under durum wheat, agricultural revenue and level of subsidy (€/ha)

		2000	2001	2002	2003	2004	2005	2006	3 years prior to reform	After reform	Change
France	Area under durum wheat	20%	21%	23%	24%	25%	26%	24%	25%	24%	-3%
	Agricultural Revenue	1,200	1,224	1,351	1,322	1,327	1,258	1,253	1,302	1,253	-4%
	Subsidies	370	370	381	384	373	361	375	373	375	1%
	Total Income	1,570	1,594	1,732	1,706	1,699	1,618	1,628	1,675	1,628	-3%
	Of which durum wheat										
	Income	124	145	167	167	177	178	169	174	169	-3%
	Subsidy	46	50	55	53	45	42	14	47	14	-71%
	Income from durum wheat	170	196	222	220	222	220	183	221	183	-17%
	Total Subsidy % Total Income	11%	12%	13%	13%	13%	14%	11%	13%	11%	
Greece	Area	48%	51%	51%	52%	52%	53%	45%	53%	45%	-14%
	Agricultural Revenue	1,020	1,170	1,258	1,232	1,248	1,237	1,001	1,239	1,001	-19%
	Subsidies	638	548	472	495	480	481	707	485	707	46%
	Total Income	1,658	1,718	1,730	1,727	1,728	1,717	1,707	1,724	1,707	-1%
	Of which durum wheat										
	Income	152	182	159	151	157	156	137	155	137	-11%
	Subsidy	148	148	148	151	150	143	17	148	17	-88%
	Income from durum wheat	301	330	307	301	307	299	155	302	155	-49%
	Total Subsidy % Total Income	18%	19%	18%	17%	18%	17%	9%	18%	9%	
Italy	Area	39%	40%	42%	39%	39%	34%	31%	40%	32%	-19%
	Agricultural Revenue	1,286	1,388	1,464	1,816	1,830	1,771	1,670	1,703	1,720	1%
	Subsidies	354	367	365	337	348	339	357	350	348	0%
	Total Income	1,641	1,756	1,829	2,154	2,177	2,110	2,028	2,053	2,069	1%
	Of which durum wheat										
	Income	186	208	209	183	179	162	180	190	171	-10%
	Subsidy	126	130	120	117	106	8	8	114	8	-93%
	Income from durum wheat	312	339	329	300	286	170	188	305	179	-41%
	Total Subsidy % Total Income	19%	19%	18%	14%	13%	8%	9%	15%	9%	
Spain	Area	29%	29%	31%	32%	32%	32%	33%	32%	33%	3%
	Agricultural Revenue	415	398	423	515	721	427	492	554	492	-11%
	Subsidies	236	225	232	220	219	220	218	220	218	-1%
	Total Income	650	622	655	735	941	647	709	774	709	-8%
	Of which durum wheat										
	Income	89	99	91	111	126	51	116	96	116	22%
	Subsidy	62	64	68	71	66	60	27	66	27	-58%
	Income from durum wheat	151	162	158	182	191	111	144	161	144	-11%
	Total Subsidy % Total Income	23%	26%	24%	25%	20%	17%	20%	21%	20%	

Source: FADN

The table reveals that the level of total subsidies (coupled and decoupled) per hectare in France, Italy and Spain did not change following the reform. The Greek data do not conform to this pattern. Previous experiences (such as the Study on the Cotton Sector in the EU[19]) revealed that, when filling out the FADN farm return forms, Greek farmers tend to include the subsidy received for a specific crop in the price paid to them. At the same time, however, the subsidy is also recorded separately in the relevant section of the form, thereby leading to a "double counting" of the subsidy received. In light of this, for Greece only, we cannot draw clear conclusions based on the evidence of this analysis alone.

For France, Italy and Spain, the outcome of this analysis suggests that fluctuations in income are the result of the changing value of agricultural production, as the level of total support prior and after the reform has remained virtually unchanged. The importance of the subsidy to total per hectare revenue is dependent upon the value of the individual crops and the intensity of production. The proportion is highest in Spain and lowest in France.

While, based on these findings, the total level of subsidy appears unchanged, the decoupled proportion has increased with the adoption of the single farm payment.

Importance of coupled payments to durum wheat revenue

Focusing on the durum wheat specialists[20] identified in the FADN sample for which production costs and gross margins were calculated, we have examined the income from one hectare of durum wheat for the four case study MS in the traditional producing regions.

Table 4.31 shows the levels of coupled aid from the FADN data to 2006. For France, Greece and Spain the three years prior to the reform covers the average annual aid in the years 2003 to 2005, while the post reform period is 2006. In The case of Italy, the pre-reform period is the average of 2002 and 2004 and the post reform period, the average of 2005 and 2006. In terms of aid received prior to the introduction of the reform in the four case study MS, the level of coupled aid was highest in France averaging at €558 per hectare, and lowest in Italy at €418 per hectare. Following the reform, the level of coupled aid fell by between €350 per hectare and €325 per hectare, in France and Greece, respectively. Following the reform, the level of coupled aid is highest in France and lowest in Italy.

Table 4.31: Level of coupled aid, pre- and post reform

	France		Greece		Italy		Spain	
	3 yrs pre-reform	Post reform	3 yrs pre-reform	Post reform	3 yrs pre-reform	Post reform	3 yrs pre-reform	Post reform
Cereals Compensatory Payment (€/ha)	284	68	153	-	109	-	186	49
Art 69				108		54		
DW Supplement (€/ha)	274	99	320		309		246	73
DW Quality Premium (€/ha)	.	40		40		38		39
Total	558	208	473	148	418	92	432	161
Change in coupled aid	.	350		325		326		271

Note:

Source: FADN

Turning now to establish the extent to which durum wheat revenue per hectare has been affected by the changes introduced in the 2003 reform, the outcome of our analysis is presented in Diagram 4.20. This reveals that the coupled proportion of revenue has fallen from

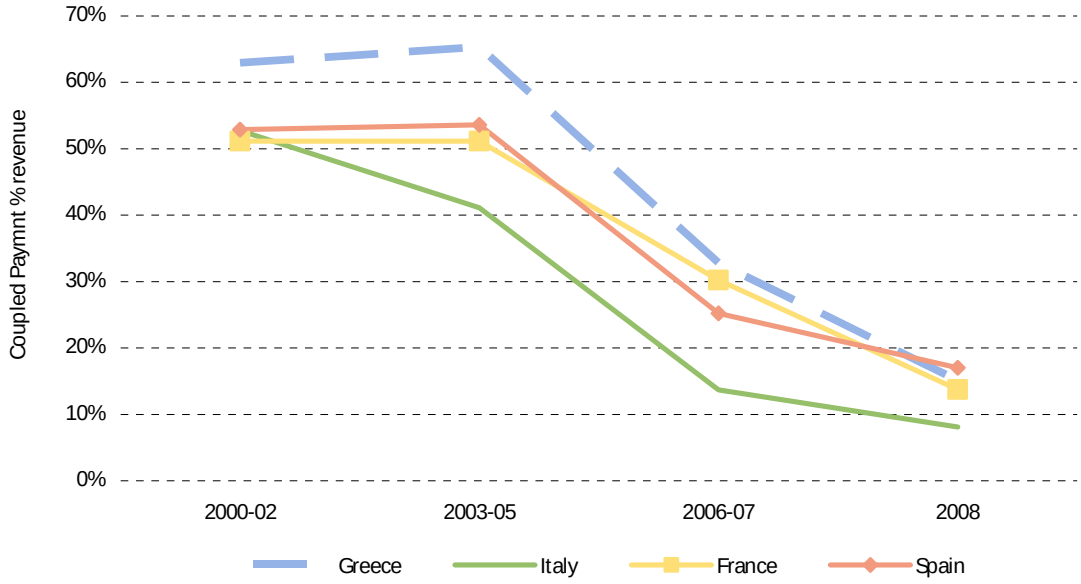
[19] http://ec.europa.eu/agriculture/analysis/external/cotton/index_en.htm

[20] Farms where 75% or more of total UAA is given over to durum wheat.

over 50% of revenue pre-reform to between 15% and 30% in 2006-07. In 2008, the sharp increase in prices meant that the coupled share of revenue fell to between 8% and 20%.

Based on the results of this analysis, in the final part of this section, we attempt to establish how the importance of coupled payments to income (on a per hectare basis) changes depending on the durum wheat prices received by farmers.

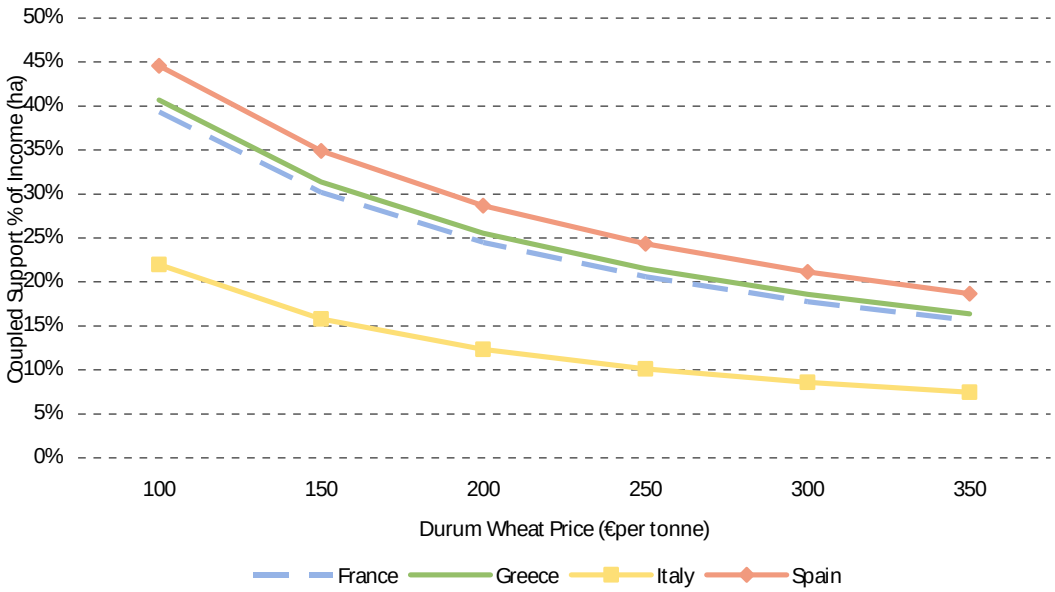
Diagram 4.20: France: revenue from durum wheat and coupled payments



Source: FADN

The importance of coupled support to per hectare income depends upon the revenue from durum wheat. This, in turn, is dependent upon yields and price. In the latter case, the higher the durum wheat price the lower the coupled support as a proportion of total revenue. Diagram 4.21 shows this in graphical terms post reform. At a durum wheat price of €100 per tonne in Spain, Greece and France the level of coupled support accounts for between 40% and 45% of total income per hectare. This then falls as the durum wheat price rises. In Italy, the importance of coupled payments is lower at all price levels as the level of coupled support is less than that of the other countries.

Diagram 4.21: The Importance of coupled payments to per hectare income at different durum wheat price levels

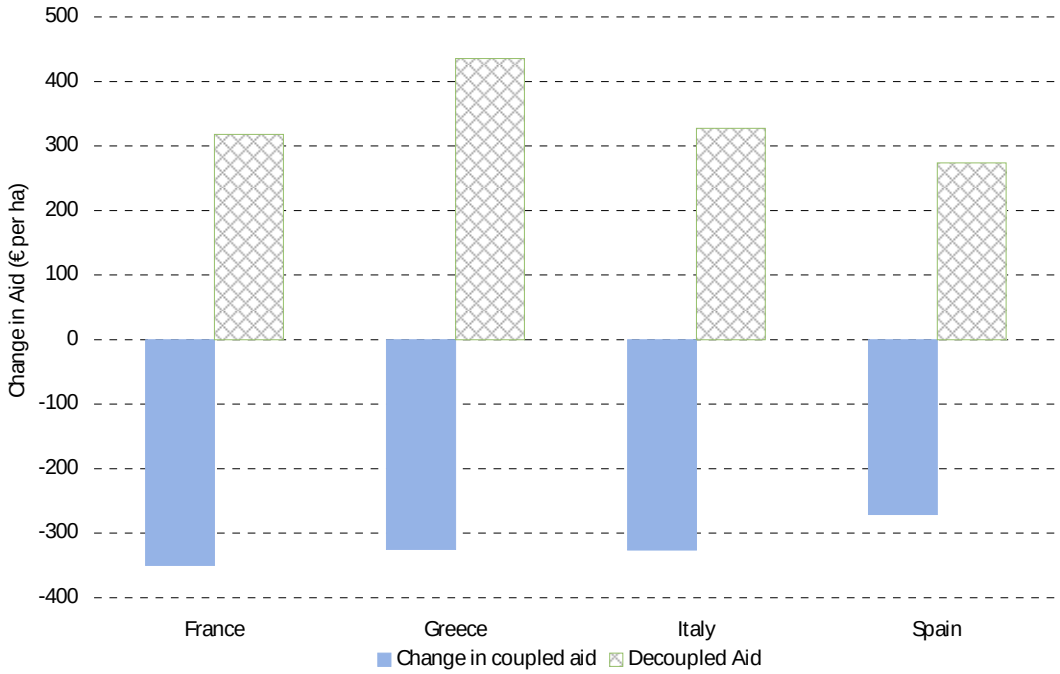


Note: in determining revenue from durum wheat yields of 3.2 tonnes per hectare are assumed in France and Italy and 2.0 tonnes in both Greece and Spain. Source: FADN

That coupled aid has fallen is to be expected, in Diagram 4.22 using the FADN data we compare the fall in the coupled aid with the decoupled aid that was paid. The data reveal that for Italy and Spain on a one hectare basis, the fall in coupled aid is compensated for by decoupled aid. For France, the decoupled aid was less, although this again may be a reflection of the small sample size. The Greek data do not conform to this pattern and the level of decoupled farmers appears higher than the coupled aid. Previous experiences (such as the Study on the Cotton Sector in the EU[21]) revealed that, when filling out the FADN farm return forms, Greek farmers tend to include the subsidy received for a specific crop in the price paid for it. At the same time, however, the subsidy is also recorded separately in the relevant section of the form, thereby leading to a "double counting" of the subsidy received. In light of this, for Greece only, we cannot draw clear conclusions based on the evidence of this analysis alone.

Diagram 4.22: Coupled versus decoupled payments

[21] http://ec.europa.eu/agriculture/analysis/external/cotton/index_en.htm



4.2.2 Importance of EC support to farm income

Changes in farm income for the whole of the farm enterprise brought about by the regime change depend not only on the level of support and underlying market prices but also farmers' crop choices. A change in the amount of durum wheat planted will affect income depending upon the price and yield of the alternative crop compared to durum wheat.

By examining trends in the FADN data for durum wheat specialists we are able to gain an insight into how farm incomes have changes following the reform. Here we consider three FADN indicators: gross farm income; farm net value added; and family farm income.

Table 4.32 shows the results. In three of the countries, Italy, Greece and Spain gross farm income, farm net value added and family farm income are higher after the reform, compared to the three year period prior to the reform. In France, the indicators are lower in the post reform period. However, in the French case, in particular, the number of observations is relatively small. The analysis only includes the years when the number of farms is more than 15.

Table 4.32: Total Farm Income (€ per farm)

	2000	2001	2002	2003	2004	2005	2006	Pre reform	Post Reform
France									
Observations		19			18	21	24		
Average Farm size		90			94	68	91	81	91
Per farm									
Gross farm income		63,218			57,523	33,690	41,730	45,606	41,730
Farm net value added		44,357			41,282	18,211	23,712	29,746	23,712
Family Farm income		24,912			19,902	5,322	8,039	12,612	8,039
Italy									
Observations	961	1,016	1,198	1,033	1,021	684	547		
Average Farm size	22	28	29	34	32	33	34	32	33
Per farm									
Gross farm income	18,334	23,054	25,142	31,716	28,637	35,308	30,183	28,498	32,746

Farm net value added	14,404	18,348	19,964	25,786	23,187	29,383	24,711	22,979	27,047
Family Farm income	12,638	15,953	17,247	20,773	19,036	24,267	20,510	19,018	22,388
Greece									
Observations	254	292	275	266	264	259	156		
Average Farm size	19	20	20	25	24	25	29	25	29
Per farm									
Gross farm income	14,803	15,986	16,975	17,673	16,589	16,404	19,469	16,889	19,469
Farm net value added	11,719	12,817	13,895	14,121	13,367	13,022	15,198	13,503	15,198
Family Farm income	9,398	9,936	10,472	10,434	9,519	8,865	10,805	9,606	10,805
Spain									
Observations	14	25	26	61	39	44	47		
Average Farm size	51	40	47	54	65	70	76	63	76
Per farm									
Gross farm income	29,515	29,516	28,111	37,376	50,829	45,497	49,743	44,567	49,743
Farm net value added	27,238	28,016	26,334	35,661	48,626	43,689	47,294	42,659	47,294
Family Farm income	25,774	25,711	22,716	28,360	42,426	37,045	42,416	35,944	42,416

Source: FADN.

In order to overcome the limitations of a changing sample, for Greece and Italy there are sufficient observations to examine a cohort of farms. Data for the cohort is presented in Table 4.33. In this case we also break down income between EC aids (referred to a subsidies by FADN) and crop income. For both countries, the data show that gross income for the cohort of farms has fallen since the adoption of the reform. In Italy by 6.9% and in Greece by 1.1%. In Italy, the fall has been due to a fall in the subsidy, while crop income has increased. In Greece, the observations are the other away around with subsidy income rising and crop income falling. However, as stated earlier a proportion of the subsidy is included in the crop income meaning that this conclusion is not robust.

Table 4.33: Total Farm Income (€ per farm)

	2003	2004	2005	2006	Pre reform	Post Reform
Italy						
Observations	79	79	79	79		
Average Farm size	35	35	35	36	35	35
Durum wheat Area	29	29	28	29	29	28
Per farm						
Gross farm income	26,278	22,158	20,372	24,732	24,218	22,552
Subsidy	14,967	14,969	11,981	12,514	14,968	12,247
Crop income	11,312	7,189	8,391	12,218	9,250	10,304
Farm net value added	20,575	16,358	14,573	18,931	18,466	16,752
Family Farm income	17,726	13,575	11,693	15,521	15,650	13,607
Greece						
Observations	59	59	59	59		
Average Farm size	38	37	38	35	37	35
Durum wheat Area	33	32	33	31	33	31
Per farm						
Gross farm income	19,575	21,456	20,473	20,271	20,501	20,271
Subsidy	17,017	16,568	17,345	17,426	16,977	17,426
Crop income	2,558	4,887	3,128	2,844	3,524	2,844
Farm net value added	15,229	17,055	15,877	15,482	16,054	15,482

Family Farm income	10,329	11,945	9,691	10,186	10,655	10,186

Source: FADN

4.2.3 The Importance of unpaid labour (Family labour)

The FADN data give an indication of the amount of labour involved in durum wheat production. Changing levels of labour use pre- and post reform were discussed above in Section 4.1.6. Here, we examine changes in the returns to labour by dividing the gross margin by unpaid labour hours to determine an implicit wage rate. This is then compared to the hourly wage payable to paid labour. The results of this analysis are shown in Table 4.34. This analysis excludes decoupled payments. In France, the implicit return to labour falls from €20 per hour pre-reform to €4 per hour post reform (at 2006 prices and margins). In Greece, the change is from €4 per hour to €0.7 per hour, while in Italy the change is from €6.7 per hour to €1.2 per hour. Finally in Spain, the transformation is from €15.2 per hour to €10.8 per hour.

These returns are then compared to paid wage rates (which are also shown in Table 4.34). Diagram 4.23 compares the two wage rates at both the gross margin prevailing in 2006 and the gross margin in 2008. The analysis reveals that prior to the reform, the implicit return to unpaid labour was higher than that of paid labour. Following the reform the implicit return fell below that of paid labour at 2006 prices. With the rise in prices in 2008, and despite higher costs, the returns to unpaid labour reverted back to being above paid labour rates.

Table 4.34: Comparison of Implicit wage rate for unpaid and paid labour (€ per hour)

	2000	2001	2002	2003	2004	2005	2006	Average 3 years before reform	Post-reform
Unpaid Labour									
France	8.0	17.9	31.5	24.6	23.3	13.0	4.0	20.3	4.0
Greece	2.7	3.3	2.7	3.6	4.3	4.0	0.7	4.0	0.7
Italy	5.9	7.3	6.4	6.5	7.3	0.6	1.9	6.7	1.2
Spain	16.1	14.2	15.5	15.7	16.4	13.6	10.8	15.2	10.8
Paid Labour									
France	11.5	5.9	10.0	9.1	8.9	10.7	13.2	9.6	13.2
Greece	2.0	2.3	2.4	2.4	2.8	2.9	2.7	2.7	2.7
Italy	5.1	5.6	5.9	6.5	6.1	6.6	6.5	6.2	6.5
Spain	5.1	5.5	4.5	4.9	5.1	5.3	5.6	5.1	5.6

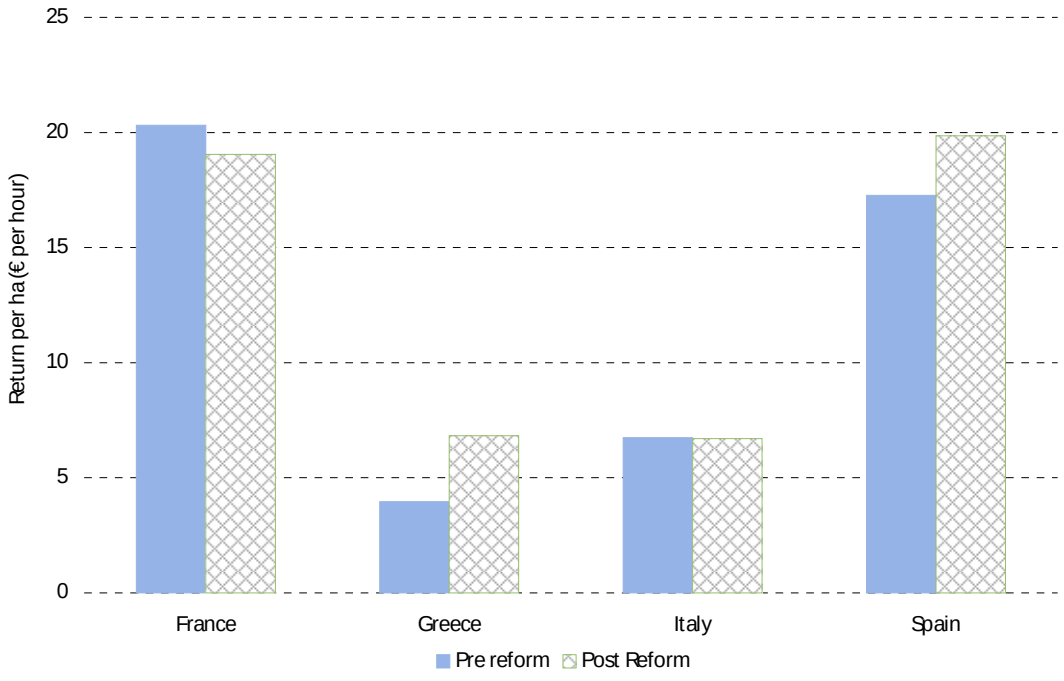
Source FADN

Diagram 4.23: Difference between implicit unpaid labour rate and paid labour wage (€ per hour per hectare)

Source: FADN

Farm income should include the decoupled payment in the calculation of the implicit wage. Including the decoupled payment into the implicit wage calculation is shown for the FADN data in Diagram 4.24. This reveals that per hour incomes were at a similar level per and post reform.

Diagram 4.24: Implicit Wages to durum wheat production (including coupled and decoupled payments)

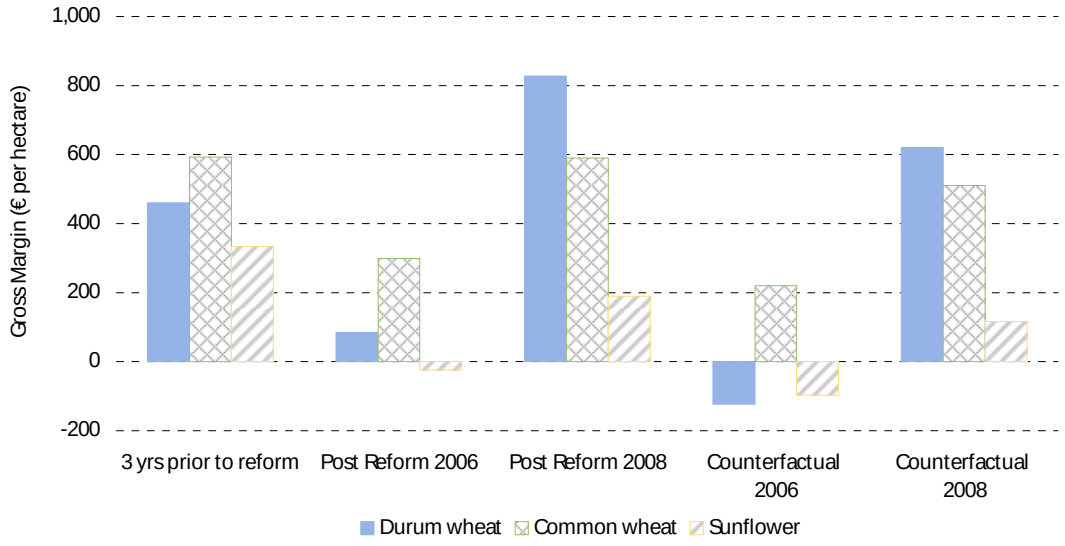


4.2.4 Importance of coupled payments in the ranking of gross margins

In this section, we highlight the changes to the gross margin following the reforms (at both 2006 and 2008 costs and prices) and show the effect of the counterfactual case when coupled support is removed for all crops. The comparison is made between durum wheat and non-irrigated competing crops, common wheat and sunflower. The focus is on the traditional areas of the four case study MS.

In **France,** in terms of the ranking of the crops, common wheat ranked ahead of durum wheat prior to the reform and in 2006. At 2008 costs and prices, durum wheat was more profitable than common wheat (Diagram 4.25). This situation is different in the non-traditional areas as revealed by the case study. In these regions, durum wheat was shown to have always a higher gross margin than common wheat, hence the area under durum wheat has increased in these regions.

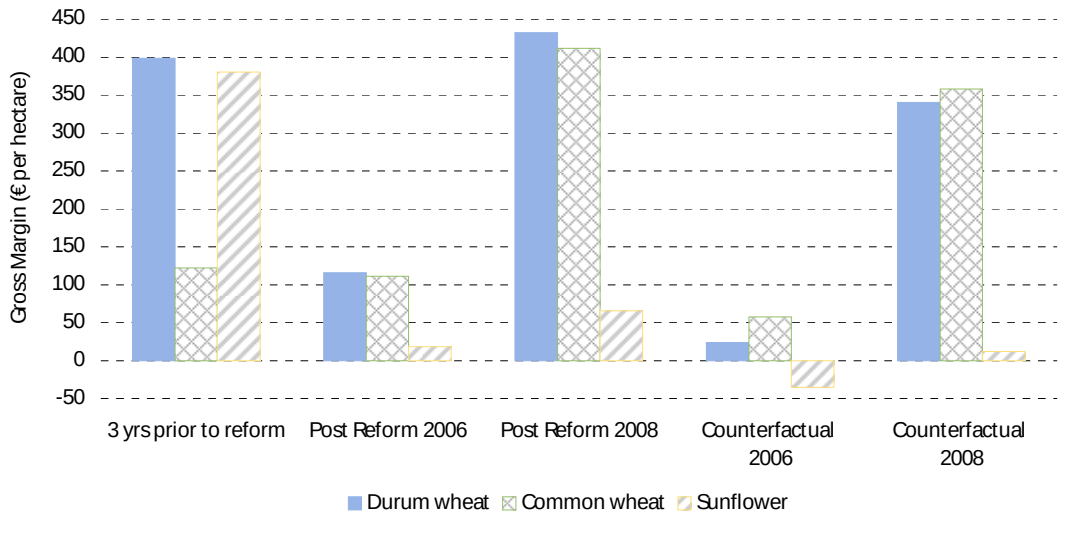
Diagram 4.25: France, gross margins, pre- and post-reform and the counterfactual case



Source: FADN, DG Agri

In **Italy** durum wheat is always ranked first. This outcome coincides with the responses from the questionnaires, where durum wheat was cited as the most profitable crop (Diagram 4.26).

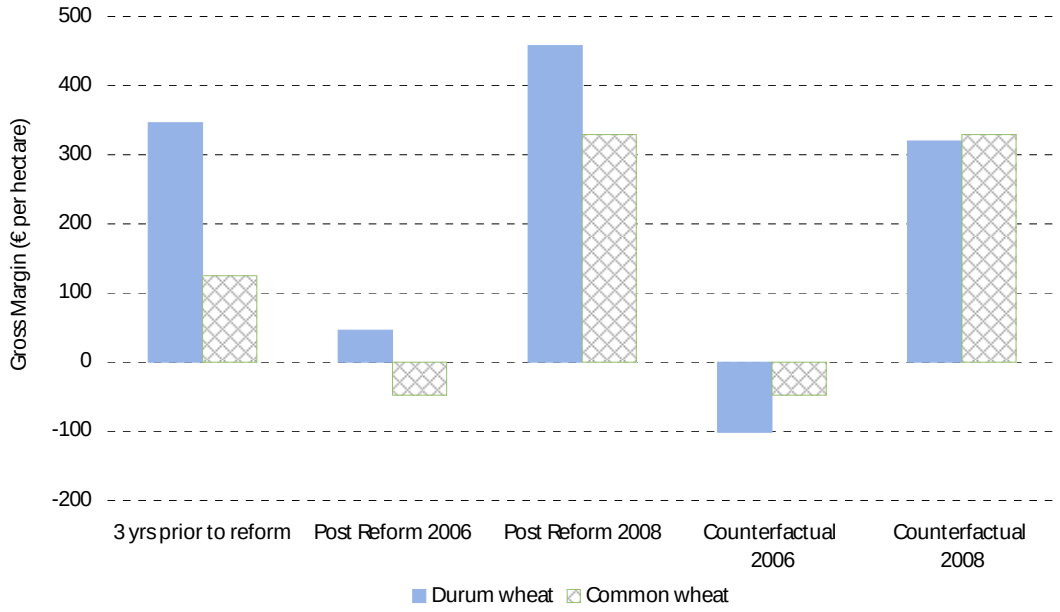
Diagram 4.26: Italy, gross margins, pre- and post-reform and the counterfactual case



Source: FADN, DG Agri

In **Greece,** durum wheat is ranked first pre- and post reform. However, at low prices in the counterfactual case, common wheat is ranked above durum wheat. In the questionnaire responses, durum wheat was ranked after cotton. However, cotton requires irrigated land for production which is not the case for durum wheat (Diagram 4.27).

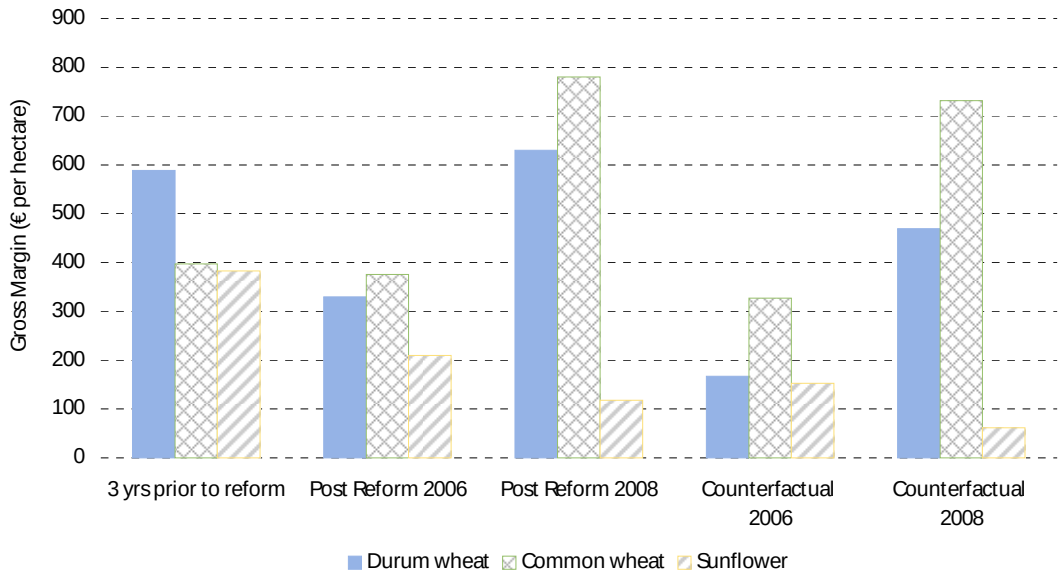
Diagram 4.27: Greece, gross margins, pre- and post-reform and the counterfactual case



Source: FADN, DG Agri

In **Spain,** durum wheat ranked above common wheat prior to the reform (Diagram 4.28). With the reform this changed and it continues to be the case both post reform and in the counterfactual case that common wheat ranks above durum wheat. This helps to explain the switch by producers to common wheat following the reform in Andalucia.

Diagram 4.28: Spain, gross margins, pre- and post-reform and the counterfactual case



Source: FADN, DG Agri

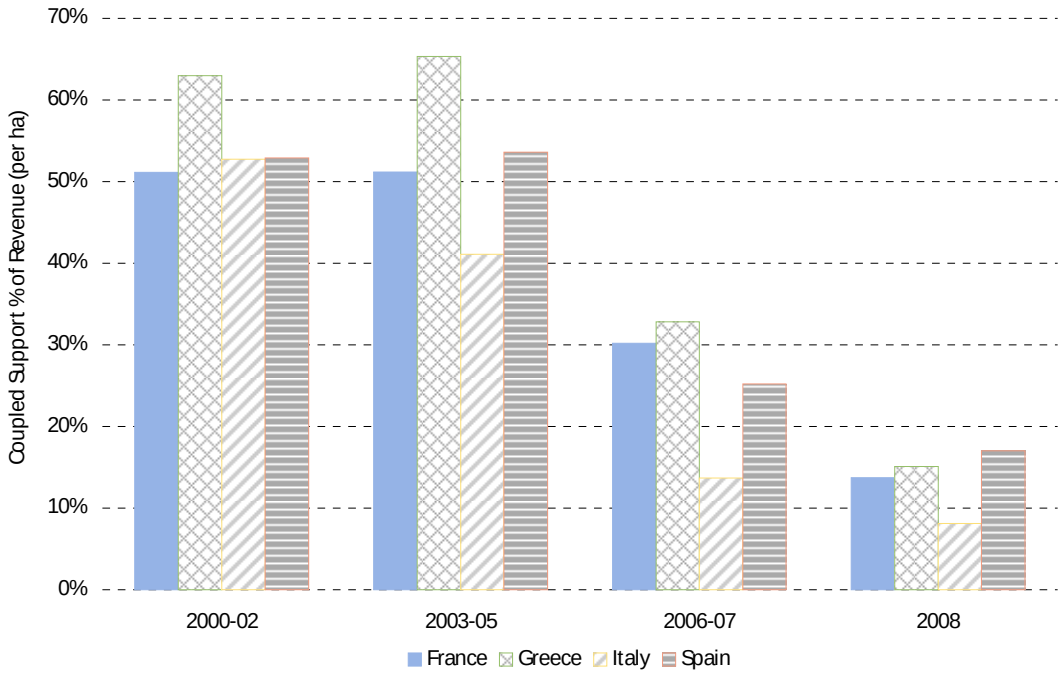
In all case study MS, the change in prices between 2006 and 2008 has significantly improved gross margins as revealed in our analysis. In this regard, it is noticeable that the price paid by wholesalers was cited by producers answering the questionnaire as the main reason behind their crop choice.

4.2.5 Conclusions

Q1.2. To what extent have the CAP measures supporting durum wheat contributed to the income of producer farmers?

For one hectare of durum wheat, prior to the reform coupled aid accounted for 50% or more of total revenue. Following the reform this fell to 30% in France, Greece and Spain. In Italy the proportion was lower. In the latter case, this was because the fall in the level of coupled aid was highest in Italy. With high prices in 2008, the importance of the coupled aid as a proportion of total revenue fell further (Diagram 4.29)

Diagram 4.29: Coupled Aid as % of Per Hectare Revenue



The FADN data for durum wheat producers reveal that the fall in coupled aid following the reform was almost totally matched by the decoupled payment in Spain and Italy, while in France the decoupled aid was 9% lower. In Greece, the decoupled payment was higher than the coupled payment. In the case of France and Greece, this finding is partly due to the limitations of the FADN data set. In France the data set is small, while in Greece, past experience points to the double counting of aid. That the fall in coupled payment was offset by the decoupled payment in Italy and Spain implies that total per hectare incomes have largely been unchanged following the reform with farmers being given greater flexibility in their crop choices. This observation is matched by examining the per hectare income of all farmers growing durum wheat. The level of subsidy (coupled plus decoupled) per hectare was unchanged in France, Italy and Spain. No conclusions could be drawn for Greece due to the reasons stated above.

Further insights into changes in total farm income can be gained by examining trends in the FADN data for durum wheat specialists. In three of the countries, Italy, Greece and Spain gross farm income, farm net value added and family farm income are higher after the reform,

compared to the three year period prior to the reform. In France, the indicators are lower in the post reform period. However, in the French case, in particular, the number of observations is relatively small.

While changes to coupled payments and the move to the Single Farm Payment have lowered gross margins for both durum wheat and competing crops, the ranking of durum wheat has not changed noticeably following the reform. The only exception to this is Spain, were common wheat ranks above durum wheat following the reform.

Evaluation question 1.3: Effects on quality

4.3 Quality

There are a number of attributes to durum wheat quality. Its use in the making of pasta products is because of its yellow-amber colour, high protein and gluten content and superior cooking quality. Also important is the consistency of quality, with processors needing a consistent product to produce uniform products.

Under the 2003 reform, there are two policy instruments that have been adopted to improve quality, the durum wheat quality premium and the Article 69 support in Italy and Greece. While farmers in these two MS had a higher incentive to improve varieties than their counterparts in Spain and France, in our analysis it is impossible to distinguish between the effects of these two policy measures. For Italy and Greece, our assessment refers to the combined impact of these two measures.

In this analysis, changes in the quality of production are determined primarily from interviews with processing companies and their associations, but also through the use of quantitative data that exist for Italy and France.

An additional quantitative measure is the area that claims the quality premium and how that has changed over time.

Changes in price differentials between EU and North American durum wheat are analysed to provide an indication of the evolution of quality, although there are many other factors apart from quality that account for this differential. The hypothesis is that a narrowing of the differential of North American durum wheat over EU durum wheat would imply an improvement in EU quality, while a widening would suggest a reduction in crop quality.

The judgement criteria, indicators and data sources used in this discussion are presented in Table 4.35.

Table 4.35: Question 1.3 judgement criteria, indicators and data sources

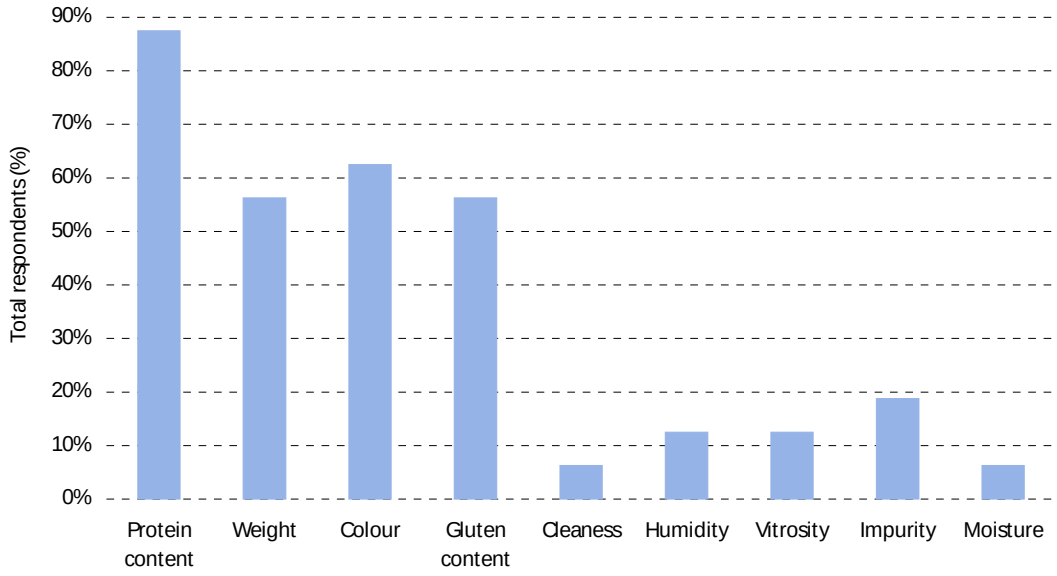
		Quantitative	Qualitative
Change in quality	Processors perception of quality change Changes in seed varieties Change in quality attributes	Case studies Ministry Agriculture, Italy, ONIDGC, France	Interviews with millers and associations Farm interviews
Change in % of producers receiving quality premium	Area covered by quality premium	DG Agri	.
Changes in quality price differentials	Price data by quality, differentials between countries and within countries (i.e., Italy)	Eurostat/International. Grains Council/DG Agri	

4.3.1 Changes in quality

Producer and processor perceptions

In both the farmer and processor questionnaires, respondents were asked how quality was measured. Where responses were given, the most common responses from both set of respondents were protein content, specific weight and colour. Among the processors protein content was the most commonly cited measure of quality as revealed by Diagram 4.30.

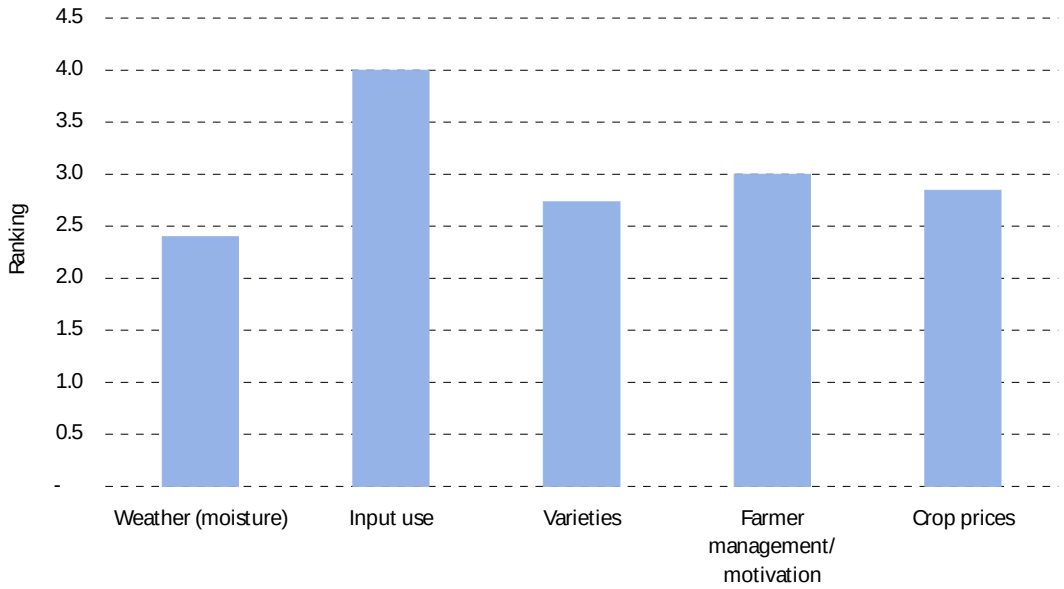
Diagram 4.30: Processor questionnaire, quality characteristics



Note: respondents were allowed more than one response
Source: Processor questionnaires

Processors were also asked to rank the most important determinants of quality, with 1 equal to the most important characteristic. Diagram 4.31 shows the average responses, the lowest ranking is the characteristic that is considered to be the most important. The diagram reveals that processors cited the weather, particularly moisture levels, as being the most important determinant of quality (although this was considered to be less important in Italy). Generally, the drier the conditions during the growing season, the better the quality. This was followed by variety, price and farm management. Input use was cited as being the least important quality determinant.

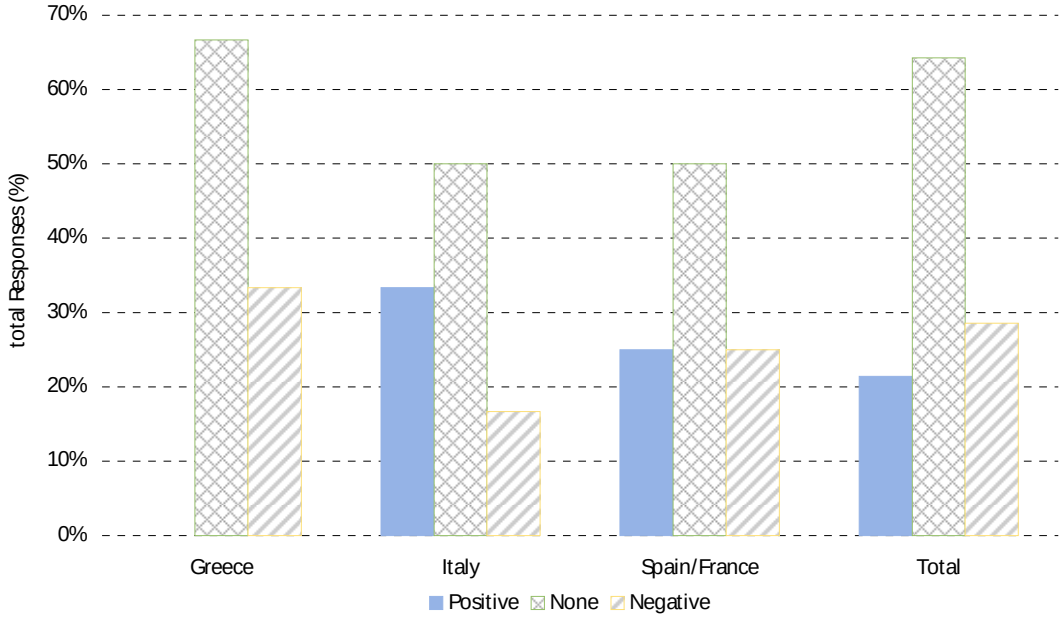
Diagram 4.31: Durum wheat quality determinants (Ranking 1 for most important, hence lowest ranking is considered the most important)



Source: Processors questionnaires

When processors were asked whether quality had improved following the reform, the most common response across countries was no change, although a proportion in Italy and Spain cited that that there had a positive improvement in quality, while the opposite was true in Greece (Diagram 4.32).

Diagram 4.32: Processor responses, what has been the impact of the regime change on the quality of durum wheat delivered to your factory?



Changes in variety

After weather, variety was cited as the next suggested most important determinant of quality. Farmers interviewed during the fieldwork were asked whether they had changed varieties over the last five years and secondly the reason why they had changed variety. With the exception of France, the majority of farmers had changed varieties (Spain 90%, Italy 75%, Greece 52%, and France 48%). The main reasons cited for changing variety were improved yields followed by improved quality. In France, it is important to note that the questionnaires were

administered in a non traditional region, where the quality premium for certified varieties does not apply.

Trends in quality in Italy

More objective quality measures can be found though analysing published data of quality attributes. For Italy, we cross checked the evidence provided by the questionnaires with data on the quality aspects of durum wheat varieties published by a number of institutional sources. One of these sources is a survey conducted by the Ministry of Agriculture on the quality of durum wheat cultivated across Italy. Examination of the data reveals the key points summarised in Table 4.36.

- Following the reform, there was a significant change in the set of durum wheat varieties cultivated by growers, a number of varieties were abandoned and new varieties adopted.
- The table also shows the large number of varieties that qualify for the quality premium. The list of varieties eligible to receive support under Article 69 is even larger. This is separate from the list of varieties receiving the quality premium. Interviews with stakeholders in the sector revealed that the large number of varieties is due to the differences in agro-climatic conditions in the durum wheat growing areas.

Table 4.36: Summary of results

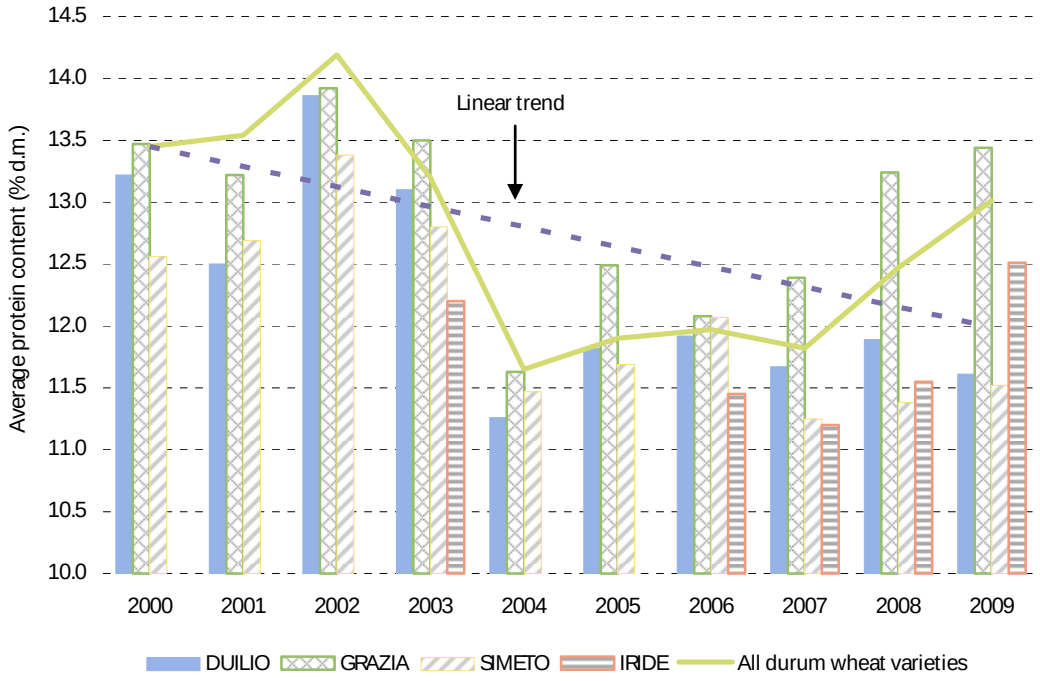
Number of durum wheat varieties whose share in the sample declined between 2004 and 2008	66
Number of durum wheat varieties whose production ceased in 2008	67
Number of durum wheat varieties introduced in 2008	19
Total number of durum wheat varieties in sample	97
of which	
receiving the quality premium in 2007/08	65
receiving the Art. 69 premium (Reg. 1782/2003)	87
Total number of varieties receiving the quality premium in 2007/08	119
Total number of varieties receiving the Art. 69 premium (Reg. 1782/2003)	150

Source: Survey on durum wheat quality, Italian Agriculture Ministry

A more objective measure of quality improvement is to examine trends in protein content. Most of these data cover the traditional production regions and are collected by the Agricultural Research Council (CRA) on an annual basis. Diagram 4.33 shows the outcome of our assessment for all durum wheat varieties and four most the most common varieties over the review period. Table 4.37 shows how the share of these four varieties has changed in the sample. All four varieties receive the quality premium and payment under Article 69.

- Overall, protein content has been following a downward path since 2000. It peaked in 2002 at around 14.2%. In the following years, it fell to below 12%. It improved in 2008 and 2009, when it reached around 13%. On average the protein content has been lower following the reform (the annual average falls from 13.2% to 12.3%).
- In terms of individual varieties, *Grazia* has the highest protein content. However, cultivation of this variety declined significantly following the reform. It is followed by *Duilio*, the share of which has not changed significantly after the reform. *Simeto* and *Iride*, both of which saw their share increase post-reform, have the lowest protein content among the varieties shown here.

Diagram 4.33: Protein content of durum wheat in traditional production regions



Source: Agricultural Research Council (CRA)

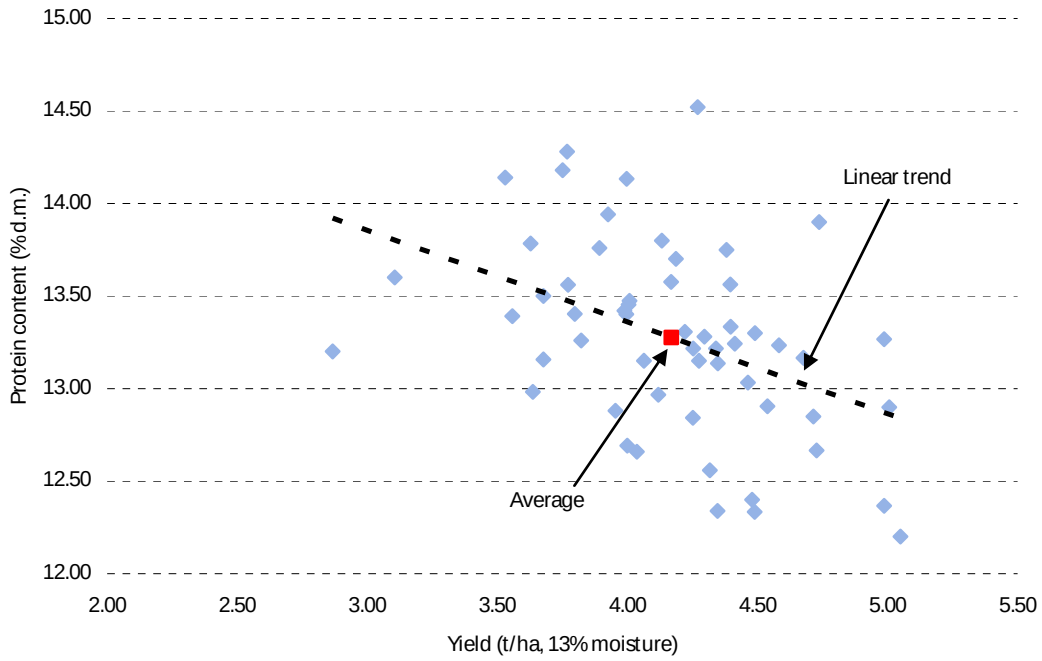
Table 4.37: Share of the four most cultivated varieties in traditional production regions (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pre reform	Post reform
Duilio	8.2	8.9	19.3	14.3	14.1	11.5	12.1	11.4	9.8	15.2	13.0	12.0
Grazia	7.5	5.1	3.8	3.1	2.5	1.3	1.5	1.8	1.1	0.2	4.4	1.2
Iride				0.2			3.9	5.7	6.5	1.1	0.2	4.3
Simeto	7.7	8.5	13.5	13.8	10.2	14.2	15.3	14.6	14.0	19.5	10.7	15.5

Source: Agricultural Research Council (CRA)

The overall decline in the protein content of durum wheat and the shift towards varieties with more stable or higher yields raise the question of whether there is a relationship between these two elements. Focusing on the case study region of Puglia, we have looked at the yield and the protein content of 56 varieties cultivated in the region in 2006. The data are collected at a number of research stations located across the region. Inspection of the data reveals the existence of an inverse relationship between yield and protein content. The data also shows that yields are relatively low at between 3 and 5 tonnes per hectare. Protein content ranges from a minimum of around 12.5% to a maximum of around 14%. As cited above in choice of varieties farmers consider yield as the most important determining factor and this may be leading to the lower protein content. It also must be stressed that all the varieties cited above receive the quality premium and the payment under Article 69.

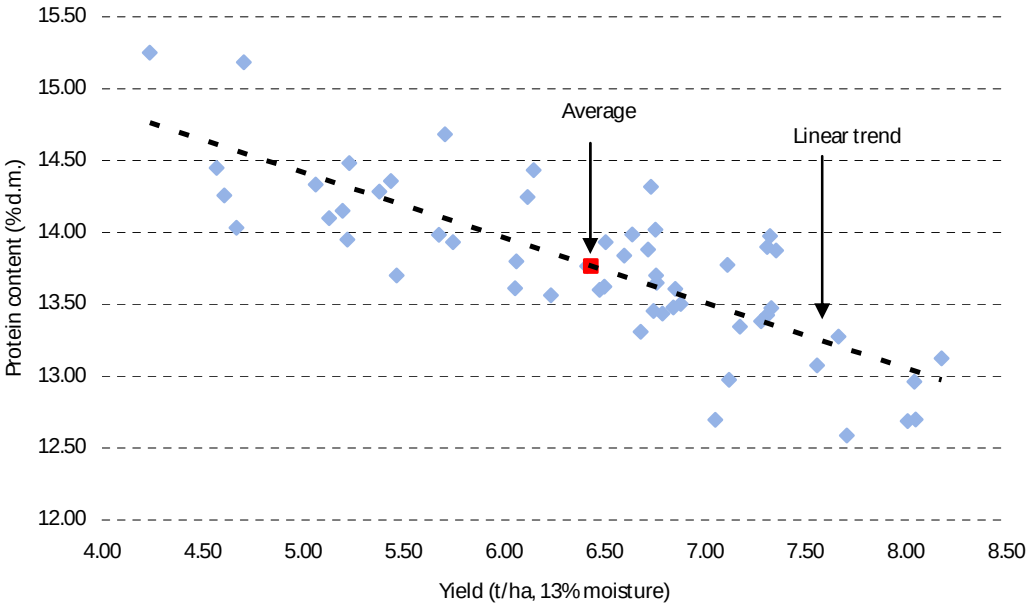
Diagram 4:34: Yield vs. protein content in Puglia, 2006



Source: Agricultural Research Council (CRA)

By way of comparison, the same analysis was conducted for another Italian region: Emilia Romagna. This is a non-traditional production region that has witnessed a significant expansion in the area planted to durum wheat over the last few years. Yields in Emilia Romagna tend to be much higher than in Puglia, with some varieties reaching more than 7 tonnes per hectare. Protein content is also higher than in Puglia, ranging between 13% and 14.5%. In 2006, on average, durum wheat varieties cultivated in Puglia had a protein content of 13.28% and yielded 4.7 tonnes per hectare. This compares with 13.77% protein content and 6.43 tonnes per hectare in Emilia Romagna.

Diagram 4:35: Yield vs. protein content in Emilia Romagna, 2006



Trends in quality in France

Table 4.38 shows the evolution of protein content in four durum wheat producing areas in France over the review period. South East and South West are traditional production areas.

- The average protein content in France tends to be higher than in Italy.
- On average, there has been no significant change in the level of quality after the reform in the regions surveyed.

Table 4.38: Trends in protein content in France (N x 5,7, % d.m.) in traditional and non traditional production regions

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre reform	Post reform
Centre (non trad.)	12.9	13.6	14.0	15.4	13.6	14.7	15.1	14.7	13.9	14.5	14.3
West (non trad.)	12.9	13.2	13.9	15.3	13.5	14.6	15.0	14.9	13.6	14.4	14.3
South-West (trad.)	13.7	13.7	14.9	15.2	13.8	14.9	14.2	15.2	14.0	14.3	14.6
South-East (trad.)	13.3	12.8	13.5	13.6	13.3	15.0	14.1	13.9	14.0	14.1	14.0

Source: ONIGC
Note: Centre: Eure-et-Loir, Loir-et-Cher, Loiret
West: Charente-maritime, Vendee, Vienne
South-West: Aude, Haute-Garonne, Gers, Tarn
South-East: Alpes-de-Haute-Provence, Bouches-du-Rhone, Gard, Heralt, Vaucluse
Pre-reform : 2004-2006, post-reform :2007-2008

Trends in quality in Spain

The protein content of Spanish durum wheat in traditional production regions is presented in Table 4.39. Data are only available for the years 2003-2008.

- The average protein content in Spain tends to be higher than in Italy but lower than in France.
- While our analysis shows that quality deteriorated slightly in the period post-reform, the great variability in protein content from year to year means that, based on this evidence alone, it is not possible to draw clear conclusions on the effect of the measures on the quality of Spanish durum wheat.

Table 4.39: Trends in protein content in Spain in traditional production regions

	2003	2004	2005	2006	2007	2008	Pre-reform	Post-reform
Average protein content	13.90%	12.80%	14.80%	14.70%	13.50%	13.70%	14.1%	13.6%

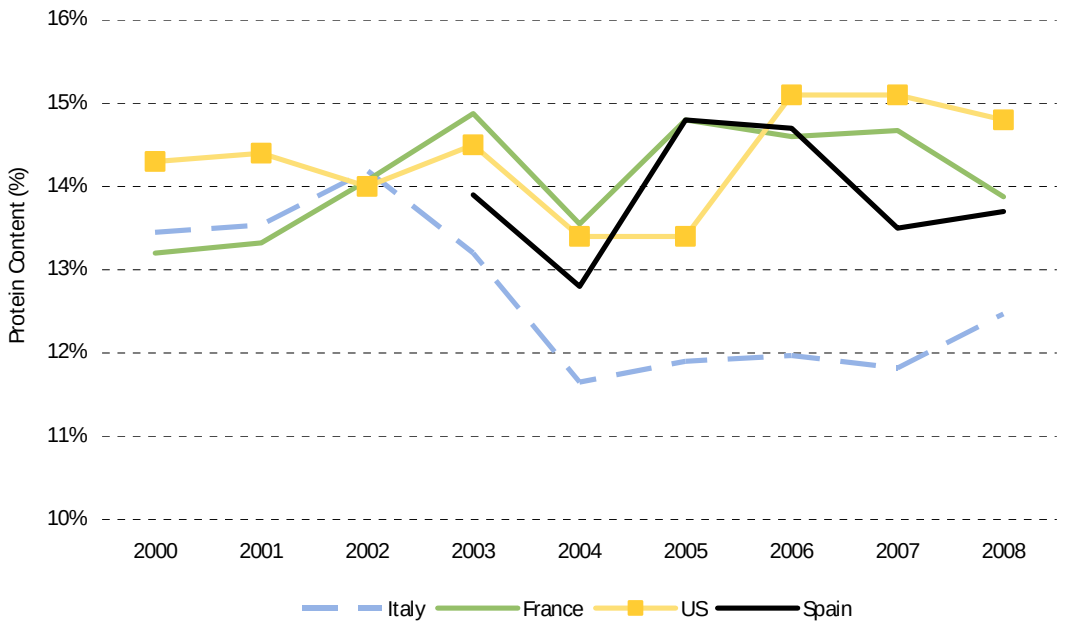
Source: Asociación Española de Técnicos Cerealistas
Note: Pre-reform 2004-2006, Post-reform: 2007-2008

Comparison of average protein content in Italy, France, Spain and the US

Diagram 4.36 brings the results of our preceding analyses together by comparing the average protein content of Italian, French, Spanish and US durum wheat over the review period. It is important to point out that, while the use of certified varieties ensures that farmers receive the quality premium, this is by no means a guarantee that, within the list of certified varieties, growers will choose those with higher protein content.

French protein content is broadly in line with the level of quality achieved by US durum wheat. This helps explain why, within the EU, France is the largest exporter of durum wheat. Within the EU, Italy is the largest importer of French durum wheat. The quality of Spanish durum wheat fluctuated significantly over the review period.

Diagram 4.36: Average protein content of Italian, French, Spanish and US durum wheat



Source: Agricultural Research Council (CRA), ONIGC, IGC

4.3.2 Producers receiving the quality premium

An indication of quality change can be gained from examining the area covered by the quality premium, as the premium is only payable for area sown with a minimum amount of eligible seed (varying depending on the MS, see discussion below). Table 4.40 shows the areas on which the premium was paid and the maximum guaranteed area.

Table 4.40: Maximum guaranteed area vs. area on which the quality premium was claimed

	MGA	2004	2005	2006	2007	2008
Greece	617	620.9	742.4	494.6	410.9	441.0
Spain	594	584.5	896.8	615.3	489.9	521.4
France	208	284.7	302.1	302.2	275.1	269.6
Italy	1646	1,331.1	1,249.8	916.2	1,018.3	1,180.2
Austria	7	6.9	13.6	12.7	10.9	13.2
Portugal	118	116.1	2.6	2.5	0.9	2.7
Total						

Source: DG Agri, Eurostat

Diagram 4.37 shows the area on which the quality premium was paid as a proportion of the traditional area. The diagram reveals that in France and Spain, the whole area receives the quality premium. In Italy, this is around 80% of traditional durum wheat area. Our analysis shows that there has been a rising trend in the area receiving the premium since 2006. In Greece, there has been a reduction in the proportion of the area receiving the quality premium. This is reportedly because the cost of certified seed is greater than that of non-certified seed and hence producers have made more use of own and non-certified seed.

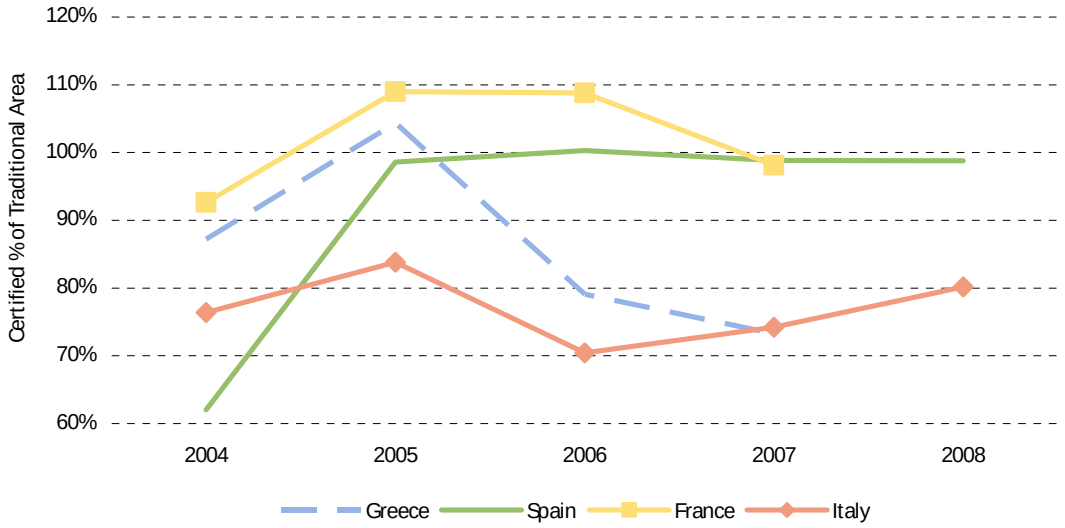
From the processors responses it is apparent that the quality premium has not led to an overall increase in quality. There are three possible explanations for why this may be the case:

- From the discussion above it is apparent that a large number of varieties are eligible for the premium and the characteristics of these varieties vary. Of the eligible varieties,

farmers will select the higher yielding varieties (assuming no change in production costs) as these will maximise their revenues, this may be to the detriment of quality.

- The large number of eligible varieties and the small farm size mean that there is little consistency in the qualities received by millers.
- The implementation of the quality premium is different across MS. In Greece, the requirement is that 80 kg of eligible seed is used per hectare (compared with total use of per ha of 250 kg). This limits the potential impact of the premium. In Italy, 180 kg per hectare of eligible seed is required, while in Spain this requirement is higher at 250 kg per ha.

Diagram 4.37: Area on which the quality premium was paid as a share of the traditional area



Source: DG Agri, Eurosta

4.3.3 Changes in price differentials

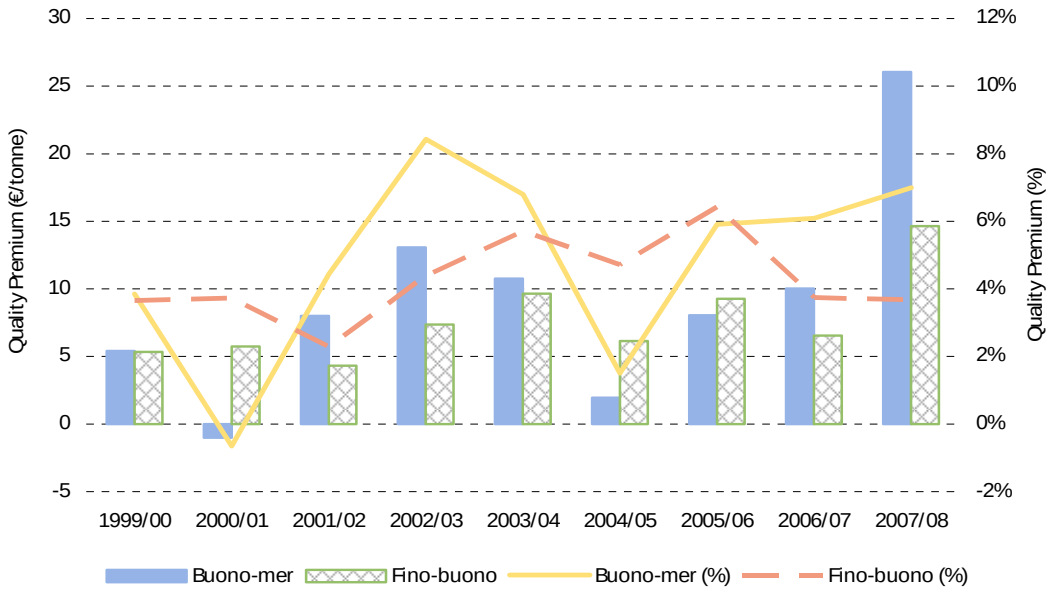
Prices of durum wheat by quality are only available for one market, Italy. In this case, three qualities are defined[22]. The highest quality *fino* has a minimum protein content of 13%.

Excluding 2007/08 when prices rose very strongly, the data in Diagram 4.38 reveal that the premium for high higher quality durum wheat is unchanged pre- and post-reform, both in absolute and percentage terms. The premium for *buono mercantile* over *mercantile* averaged €7 per tonne pre-reform and was the same in the years following the reform, excluding the price rises of 2007/08. The premium for *fino* over *buono mercantile* increased modestly following the reform (an average annual increase of under €1 per tonne). This suggests either unchanged demand for higher quality or unchanged supply. That the quality of supply has not changed is supported by the processors interviews, where the majority suggested that quality had not changed following the reform.

[22] **Definition of quality cases in Italy**

	Protein min	Humidity max	Ash max	Weight min
Fino	13%	12%	1%	80kg/hl
Buono Mercantile	12%	12%	1%	78kg/hl
Mercantile	11.50%	12%	1%	76kg/hl

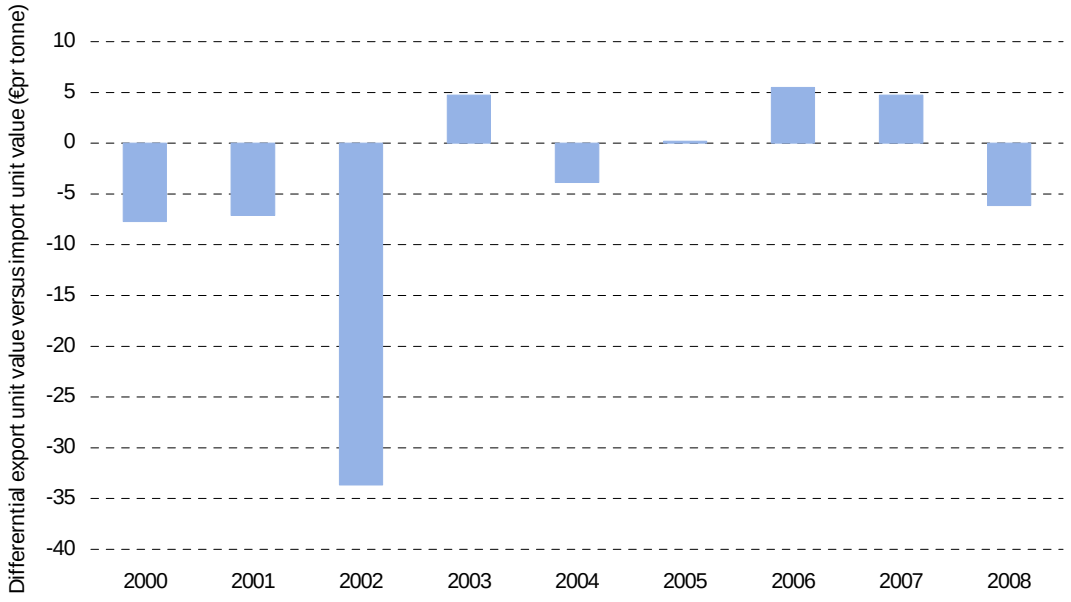
Diagram 4.38: Trends in quality premiums



Source: ISMEA

Changes in price differentials between EU and North American durum wheat provide an indication of the evolution of quality, although there are many other factors apart from quality that account for this differential. Diagram 4.39 compares annual average per tonne EU-27 export unit values with annual average EU-27 import unit values. The diagram shows that the differential varies considerably between years, although on average the differential is lower pre-reform (2000 – 2005) than post-reform (2006 – 2008). The differential rises from -€4.8 per tonne to €1.2 post reform. This could point to an improvement in EU quality relative to that of the major importing countries. However, data on changes in protein content within the EU suggest that this has not been the case.

Diagram 4.39: EU-27 Import unit values versus export unit values (€ per tonne)



As indication of changes in quality between MS can be gained by examining relative changes in per tonne export unit values. The assumption being that changes to per tonne export unit values give an indication of differences in quality. Diagram 4.40 shows the difference in export unit values compared to French export unit values. France is used as the base as it has the highest level of exports. The data show the change varies between years, however, the discount on French exports is sustained at a lower level in Greece from 2005 onwards. That average Greece export prices have fallen suggests either that demand has fallen or that relative quality has fallen. From processor interviews, there is some evidence that the latter may be true.

Diagram 4.40: Greece, Italy and Spain export unit values vs. France export unit values

Source: FADN

4.3.4 Conclusion

Q1.3. To what extent have the CAP measures increased the quality of durum wheat in traditional areas

There are two policy instruments that have been adopted to improve quality, the durum wheat quality premium and the Article 69 support in Italy and Greece. For these two countries, our analysis assesses the combined impact of these two policy measures. When asked whether quality had improved following the reform, the majority of processors interviewed across the four case study MS responded no change. Although a proportion in Italy and Spain cited that that there had been an improvement in quality.

The most important determinant of quality is weather. Variety is also important, and a large number of farmers have changed variety since the introduction of the reform. The main motivation given for this was yield improvement, followed by improved quality.

As the payment of the quality premium depends upon the use of certified seed changes in the amount claimed gives an indication of changes in quality. The assumption being that the greater the area planted with certified seed, the higher the quality of production. However, this gives inconclusive evidence to any improvement in quality. In Spain and France, seed use is totally from eligible varieties, in Italy the use of eligible varieties has increased since 2006 while in Greece it has fallen. While the use of certified seed ensures that farmers will receive the quality premium, this does not necessarily mean that farmers will choose the varieties with higher quality.

In Italy, protein content in traditional production regions has fallen over the review period. At the same time, a large number of varieties have been abandoned following the reform, while new varieties have gradually captured a sizeable share of area post reform. Of the four most common varieties cultivated, the variety with the highest protein content virtually disappeared following the reform. There is evidence that farmers tend to prefer varieties with higher yields. The large number of varieties receiving the quality premium and Article 69 payment is due to the diverse agro-climatic conditions of durum wheat growing areas.

Analysis of yield and protein content data for the traditional region of Puglia and the non traditional region of Emilia Romagna reveals the existence of an inverse relationship between yield and quality. Higher yields are associated with lower protein content and *vice versa.* In terms of economics of production, farmers have an incentive to use higher yielding varieties as these maximise their revenue per hectare.

In France and in the traditional production areas of Spain, protein content tends to be higher than in Italy. In France, there are no significant changes in quality following the reform. In Spain, quality deteriorated slightly after the reform. However, the significant fluctuations in protein content from year to year weaken the conclusions of this analysis. Our assessment indicates that, following the implementation of the reforms, quality has been largely unchanged. However, this conclusion is based on just three years worth of observations. The effect of the development and use of improved varieties and improved farmer practises may require a longer time horizon.

Chapter 5: Effects on the Downstream Sector

Evaluation question 3.1 and 3.2: Impact on the supply to the downstream sector

EQ3.1 To what extent have the CAP measures supporting durum wheat allowed sufficient levels of production (quality and quantity) at suitable prices with respect to needs of the downstream sectors, and to what extent has the support induced changes in the geographical distribution of the processing industries?

EQ3.2 To what extent is the objective of ensuring sufficient levels of production (quantity and quality) in traditional areas relevant with respect to the user industries needs (e.g. in terms of added value of local production)?

Capacity utilisation is a key determinant of profitability for the processing industry, and a sufficient level of production would be one which ensures a profitable industry. This level of production can be met by EU production or imports. Sufficient production will depend upon the proportion of EU production that is required by the industry. Suitable prices are prices that ensure that processors are not disadvantaged from using EU production.

The answer to Question 3.1 analyses the needs of processors regarding the use of EU produced durum wheat and imported product. The influence of the CAP measures upon production was analysed in detail in Chapter 4. However, CAP measures also include border measures which influence the availability of imported durum wheat. This is considered later in Chapter 6. A further factor that will need to be included in the analysis is the use of durum wheat for non-food uses. Question 3.2 takes the analysis one step further, by considering whether the objective of sufficient production is important for the needs of the industry.

For a number of these issues, great emphasis is placed on evidence collected during interviews with processors, as these are virtually the only users of durum wheat within the EU. In some cases, no additional information is available to support this evidence.

Given the overlap in judgement criteria and indicators required to answer the two questions, the following discussions covers both questions. Judgement criteria are shown in Table 5.1.

Table 5.1: Question 3.1 and Question 3.2 judgement criteria, indicators and data sources

Judgement Criteria	Indicator	Data Sources	
		Quantitative	Qualitative
Industry requirements	Volumes required by processing industry.		Processing industry interviews
	Trend in volumes processed	International Pasta Organisation (IPO), Semouliers Association	
	Exports of pasta	Exports	
Availability and use of EU durum wheat	The share of domestic durum wheat in the overall supply of durum wheat	Eurostat	
	EU durum wheat availability minus exports	Eurostat	
	Exports as % of total availability	Eurostat	
	Sufficient level of availability in traditional areas by MS		Processing industry interviews
The availability of imported supplies	Volumes of imported durum wheat Imports as % of total processed by MS		
Quality requirements	Statements by processors regarding quality requirements		Processing industry interviews
Ease of substitution EU vs imported	Statements by processors regarding substitution.		Processing industry interviews
Changes in prices of DW, EU vs. imported	Price data for EU and major importers, import and export unit values to EU	Eurostat/IGC/DG Agri/FAO/USDA	
Change in location of industry by MS	Changes in geographical distribution of the processing industry	IPO, Semouliers Association	Processor interviews
Sufficient levels of production in traditional areas	Statements by processors regarding the importance of local production		Processing industry interviews
	Changes to cost structures: imported versus EU		

5.1 Processing industries requirements

5.1.1 Trends in volumes required

Durum wheat is required by the processed industry for the production of durum wheat flour (semolina) for the pasta and couscous industries. Alternative uses are for animal feed and seed. According to the European Semouliers' Association (whose member account for 80% of the total processing industry), 7.5 million tonnes of durum wheat were processed by the European industry in 2007, the last year for which data are available. This estimate includes an allowance for processing by non-members. According to these data, processed volumes grew by 1% per annum over the review period. The rate of growth was somewhat faster pre-reform (2000 to 2004) at around 0.9% than it was post reform[23] (2005 to 2007) at 0.2%. These data though are somewhat at odds with data derived from Eurostat crop balances. The amount of durum wheat available for processing in any one year can be defined as:

Availability = durum wheat production + durum wheat imports - durum wheat used for seed – animal feed use - exports - crop losses.

These data are presented in Table 5.2 and suggest that the volumes available for processing were nearer to 8.7 million tonnes pre-reform, and 9.2 million tonnes post reform. The data suggest that availability grew by 1% per annum a similar growth level to that of the Semouliers' Association. These estimates though are 1.7 million tonnes higher than that estimated by the Semouliers over the same period. Over 1 million tonnes of this difference is due to lower production estimates by the Association. We base our assessment of production on the Eurostat figures.

Table 5.2: Durum wheat EU-27 supply-demand balance ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post-reform
Production	10,093	8,941	10,224	8,832	12,628	9,369	9,365	8,521	10,156	10,144	9,353
Imports	*1,095*	*1,305*	*1,207*	*1,358*	*1,713*	*1,807*	*1,948*	*1,990*	*1,615*	*1,336*	*1,840*
Total supply	11,188	10,246	11,431	10,190	14,341	11,176	11,313	10,511	11,771		
Non-feed use											
Feed use	*483*	*477*	*484*	*798*	*2,017*	*359*	*626*	*327*	*257*	*852*	*392*
Seed use	*937*	*955*	*1,002*	*975*	*1,028*	*917*	*747*	*698*	*756*	*979*	*780*
Exports	260	336	617	802	859	1,073	1,013	876	945	575	977
Losses	58	69	56	77	51	61	63	58	61	62	61
Change in stocks	5	28	14	- 179	1,408	- 219	-330	-675	- 44		
Availability for millers	9,445	8,380	9,259	7,716	8,979	8,984	9,195	9,226	9,796	8,756	9,300

Note: Feed is based on Eurostat data to 2004, there after estimates based on ONIGC. According to the Semouliers Association, feed use peaked in 2004/05 at 1 million tonnes and fell to 0.1 mn tonnes in 2007/08
Seed use is based on the assumption of 250 kg of seed per ha
Pre-reform period is assumed to run 2000 to 2004, post reform 2005 onwards. This is a line with the introduction of the reform in the largest producer Italy.,
Stock change based on Eurostat and ONIGC

Source: Eurostat, UNSEN, LMC

A number of observations can be drawn from Table 5.2, many of which are discussed in greater detail in the answer to other evaluation questions:

- With the fall in production, imports rose, although imports began to rise ahead of the reform in 2004;

[23] This is in line with the introduction of the reform in Italy, the largest producers.

- The use of durum wheat for feed has fallen;
- With a lower area, seed requirements have fallen;
- Exports have increased following the reform, although the trend towards higher exports began in 2002; and
- Changes in stocks levels can be considerable, given the volatility of production.

5.1.2 Exports versus domestic demand

The demand for durum wheat by the processing industry is for both domestic EU demand and for export. The export of durum wheat flour is small, while pasta and couscous exports have grown. Table 5.3 presents export levels in grain equivalent terms, a fuller discussion of trade issues is presented later in Chapter 6. Exports are dominated by pasta. Average per annum exports were 1.4% higher following the reform, although exports fell back in 2008. At a regional level, the largest fall was in exports to the US, followed by North Africa, although to a much lesser extent.

Exports to the US have been fairly stable over the review period, in 2008, they fell by around 50,000 tonnes from 2007 levels. This fall coincides with Barilla (an Italian pasta producer) opening a plant in the US at end of 2007. Exports to African countries have been following a steady decline of around 4% per year since 2000/01. The fall witnessed in 2008 is in line with this trend.

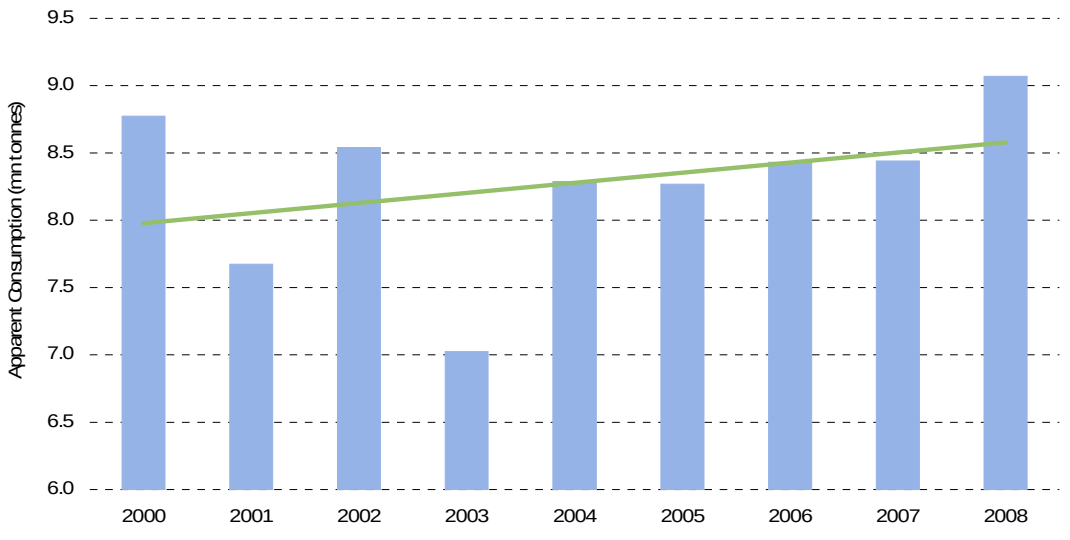
Table 5.3: EU-27, Pasta and couscous exports ('000 tonnes, grain equivalent)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post Reform
Pasta	663	711	719	686	686	711	710	718	673	693	703
Couscous	10	11	11	11	11	11	12	14	15	11	13
Total	673	722	730	697	697	722	722	733	688	704	716

Source: Eurostat

Removing exports from availability gives an indication of EU-27 durum wheat consumption. Diagram 5.1 reveals a growing consumption, although there is considerable annual variation. There is no change in this trend following the reform.

Diagram 5.1: EU-27 apparent consumption



Source: Derived from Table 5.2

5.1.3 Other uses of durum wheat

The use of durum wheat for feed production has fallen. This peaked in 2003/04 following large increase in production.

With a lower area, seed requirements have fallen and hence the use of durum wheat for seed is lower following the reform;

Changes in stocks levels can be considerable, given the volatility of production. Stocks rose strongly in 2002/03 with the harvest of a large crop. From interviews with processors it is apparent that industry held stocks were reduced to very low levels in 2007/08, partly as farmers sought to increase stocks given volatile prices.

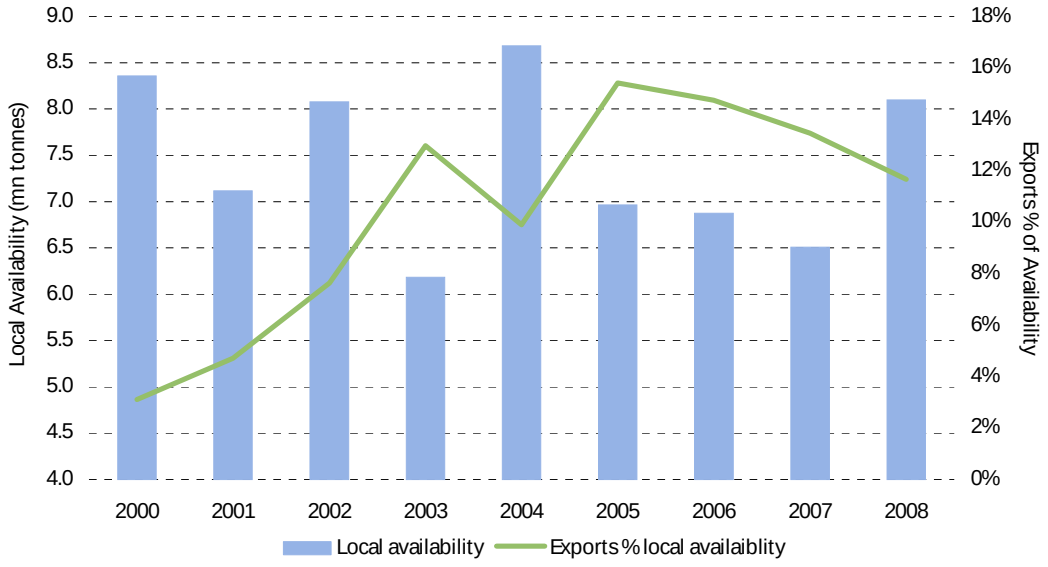
5.2 Availability and use of locally grown durum wheat by the processing industry

The availability of domestically grown durum wheat to the processing industry is defined as

> *Availability of locally produced durum wheat = EU durum wheat production minus durum wheat exports – seed use – feed use – losses*

Local availability is shown in Diagram 5.2. Prior to the reform (up to 2004) average annual domestic availability was 7.7 million tonnes, following the reform this fell to an average of 6.9 million tonnes. This average would have been lower but for higher production in 2008. Availability has been reduced due to a combination of lower production and higher exports. As the diagram reveals, exports as a proportion of local availability have moved higher since the reform.

Diagram 5.2: Exports and local availability



Source: Derived from Table 5.2

Examining the share of domestic durum wheat in the overall supply of durum wheat (Table 5.4) reveals that locally produced durum wheat accounted for 88% of total EU-27 supply prior to the reform, this fell to 83% after the reform. The importance of domestic supply varies significantly by MS. In the case study countries, the importance of local production is less in Italy (70%) than in the other member states. In the other countries, domestic supply accounts for between 80%

to over 90% of domestic supply. The only exception is in Spain in 2005 when drought reduced domestic production and increased the need for imports.

Table 5.4: Local production as a share of total supply

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post
EU-27	90%	87%	89%	87%	88%	84%	82%	81%	86%	88%	83%
Italy	73%	62%	74%	67%	79%	73%	63%	66%	75%	71%	70%
Spain	92%	93%	91%	93%	85%	51%	86%	88%	83%	91%	77%
Greece	97%	95%	99%	94%	93%	99%	97%	90%	97%	95%	96%
France	89%	84%	94%	95%	94%	97%	97%	96%	96%	91%	96%

Source: Derived from Table 5.2, Eurostat

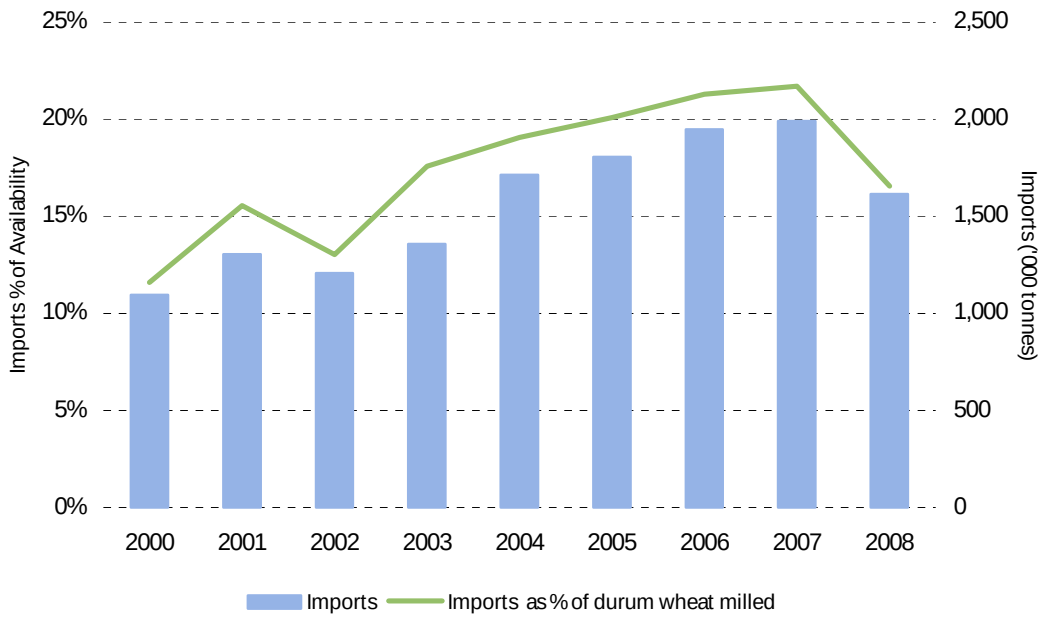
Table 5.4 can be recalculated to show the importance of production from traditional areas. In this there has been less reliance on supply from traditional areas, this has fallen from an average of 72% across the whole of the EU-27 to 68%. In Spain and France, there is greater reliance on production from non-traditional areas in total supply and in both cases following the reform traditional production accounted for under 60% of total supply.

5.3 Availability of imported supplies

With lower domestic production and higher exports, the importance of imports to meet processors requirements has increased. Diagram 5.3 shows annual volumes imported and imports as a percentage of availability. Following the reform, the dependence on imports rose from an average of 15% of total availability pre-reform, to an average of 21% post reform. In the post reform period, higher production in 2008 reduced the dependence upon imports to 17%.

Trends vary by MS, with dependence upon imports the greatest in Italy. The level of dependence upon imports has not changed in Italy after the reform. In Spain, imports have increased post-reform. If 2005 is excluded from the analysis, however, changes in imports are not significant. In France the importance of imports has reduced, even if an allowance is made for the high level of imports in 2001. Imports are lowest in Greece (Table 5.5).

Diagram 5.3: EU-27 Imports as % of availability



Source: Eurostat

Table 5.5: Imports as a % of availability

Imports % availability	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post reform
EU-27	12%	16%	13%	17%	17%	21%	21%	22%	16%	15%	20%
Italy	29%	43%	29%	37%	27%	29%	38%	36%	28%	33%	33%
Spain	14%	23%	39%	15%	35%	92%	24%	24%	18%	25%	40%
Greece	3%	7%	1%	7%	7%	1%	3%	9%	3%	5%	4%
France	32%	136%	13%	12%	14%	12%	8%	13%	5%	41%	9%

Source: Eurostat
Notes: Pre-reform: 2000-2004, post-reform: 2005-2008 for all MS.

While the level of imports has increased, as part of the interview/questionnaire, processors were asked why they imported durum wheat. The dominant response was for quality reasons. This was followed by price and supply.

5.4 Quality requirements and the ease of substitution

5.4.1 Quality requirements

As part of the interview/questionnaires process, processors were asked what the most important quality requirements for durum wheat were. As shown in Chapter 4, protein content was given as the most important quality characteristic, this was followed by specific weight and colour (in France, for instance, a yellow colouring is particularly desirable). Protein content was also cited as the main reason for paying a premium.

When asked of the change in quality following the change in regime, in the majority of cases quality was observed to be unchanged. However, in a minority of cases, in Greece quality was cited as having fallen, while in Italy a minority of processors reported that quality had improved. In France, the observation was that quality had not changed.

One further aspect of quality cited by processors in the interviews was the consistency of quality. The relatively small farm size, particularly in Italy and Greece, means that supply is very fragmented. As a result, it is difficult to achieve consistent improvements over time.

In Italy, interviews with processors revealed that the quality of the domestic crop is not sufficient to meet the industry's requirements. This means that imports of high quality durum wheat, which is then mixed at the mills with domestic production, are required to achieve the desired quality level.

This is confirmed by the outcome of our analysis of trends in durum wheat quality presented in Chapter 4, showing that the quality of Italian durum wheat is below that of other EU and world producers. The US and Canada are the main origins of extra-EU imports into Italy, while France is the main EU origin.

Millers and pasta producers across the EU try to ensure that the domestic supply of durum wheat meets the desired level of quality by offering a premium for higher quality durum wheat. The outcome of the farmers' survey indicated that over 70% of millers interviewed across the four case study MS pay a quality premium to their suppliers. Looking at the farm sector, around 40% of the sample of farmers surveyed have a contract with a trader or a processor. Quality is

included in the contract for more than 50% of the sample of respondents[24]. Fieldwork conducted in the four case study MS revealed that:

- In France, the processing industry clearly indicates which of the durum wheat varieties that receive the quality premium are most in line with the industry's needs.
- In Greece, pasta manufacturer Misko SA (Barilla Group) has joined forces with a seed producer and distributes (to contracted farmers) seed varieties not available on the market for other producers. These varieties are characterized by a high protein content. The volumes covered by this agreement are, however, quite small.
- In Italy, inter professional agreements have been established along the supply chain, involving farmers, processors, seed companies and other stakeholders in the durum wheat sector. The main feature of these agreements is the payment of a quality premium. It is estimated that, currently, these agreements cover around 10% of total Italian durum wheat output[25]. The target is to reach 25% of Italian production over the next few years.
- No comparable information was available for Spain.

Looking to the future, some concern was expressed by producers and millers about the long term competitiveness of the sector, following the loss of the quality premium. This premium often covers the higher cost of certified seed. The disappearance of the market for certified seed would in their opinion have the effect of reducing the investment in research for new and improved varieties. While this was felt likely to have repercussions at an EU-wide level, the consequences were likely to be felt more in regions such, for example South East France, where the durum wheat market is quite small compared to the markets of competing crops. This statement, however, has not been backed up by other evidence.

5.4.2 Ease of substitution

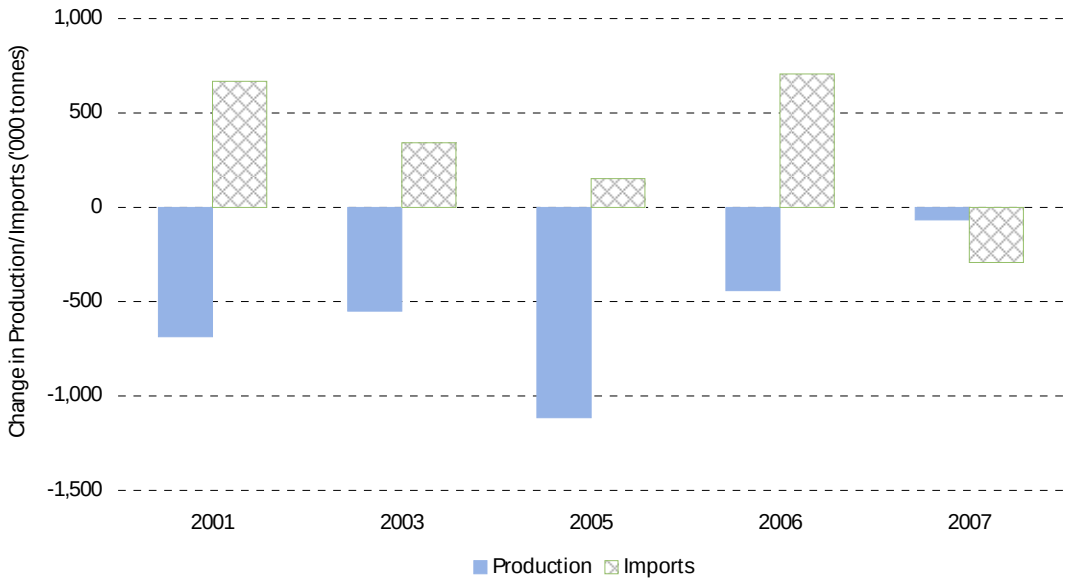
As discussed above, the use of imports is primarily for quality rather than substitution. However, a number of processors cited price and supply a second reason for substitution, suggesting that it is not difficult to switch between durum wheat from different origins. This was observed in Spain in 2008, when the price of Mexican durum wheat was cheaper than Spanish production and imports were increased at the expense of local production.

Further evidence of the ease in substitution can be found in cases where there is a poor local crop (i.e., a fall in production relative to the previous year). During these years, we can observe what happens to imports, the hypothesis being that when production falls, stocks are drawn down and imports increase to maintain availability to the processing industry. This is apparent in Italy (and in Spain following the reduction in production in 2005). In Italy, with the exception of 2007, each year that production fall relative to the previous year imports increase. Diagram 5.4 shows the change in imports for years that production fell over the review period.

Diagram 5.4: Italy, Imports and production, in years where production fall ('000 tonnes)

[24] Percentage based on the number of responses to the question: "What is included in the contract? Does it specify details of quantity, quality and price?"

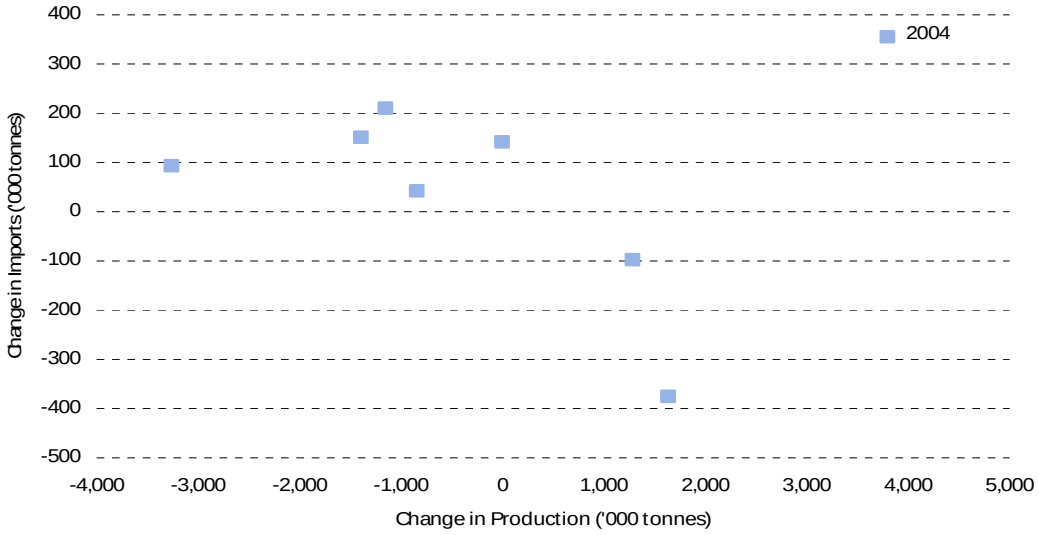
[25] *Valorizzazione della produzione nazionale del grano duro mediante il miglioramento degli standard di qualita'*, Flagella Z., October 2008, Assincer.



Source: Eurostat

Diagram 5.5 shows the relationship between the change in production and imports for the whole of the EU-27. As can be seen there is a negative relationship, with the exception of 2004. When production falls, imports rise and vice-versa. The supports the view that there is a degree of substitution between local production and imports.

Diagram 5.5: EU-27, Change in production versus change in imports



Source: Eurostat

5.5 Changes in relative prices

That there is substitutability between the two products can be seen in the behaviour of their relative prices over time. The greater the ability to switch between two competing materials, the closer their prices should remain over time — with the prices of perfect substitutes theoretically remaining equal. Diagram 5.6 compares prices for Italian durum wheat with that of imported durum wheat from the USA. Italy was chosen as it is the largest importer, while the US was selected as it has the most consistent price series. The key point to note from the diagram is that since 2003 the prices of US and Italian durum wheat have shown considerable

convergence, with the ratio of prices close to 100% with the exception of 2006. This points to considerable degree of substitutability between imported and domestic durum wheat.

Diagram 5.6: Ratio of Italian to US durum wheat prices

Source: IGC, DG Agri

5.6 Change in the location of processing industry

Over time, industry consolidation has meant that the number of durum wheat mills has fallen from an average of 200 pre-reform to 181 post reform (Table 5.6). The process of consolidation was apparent before the reform and there is no evidence that the change in reform has caused any change to industry structure or location.

In the pasta industry, limited consolidation has occurred following the introduction of the reform. The average number of plants has fallen by 1% pre- and post-reform. Where plants have closed it is as smaller factories have closed rather than due to a change in regime. This evidence is supported by answers to the questionnaires, in all cases processors reported that the change in regime had had no effect on the geographical location of the processing plants.

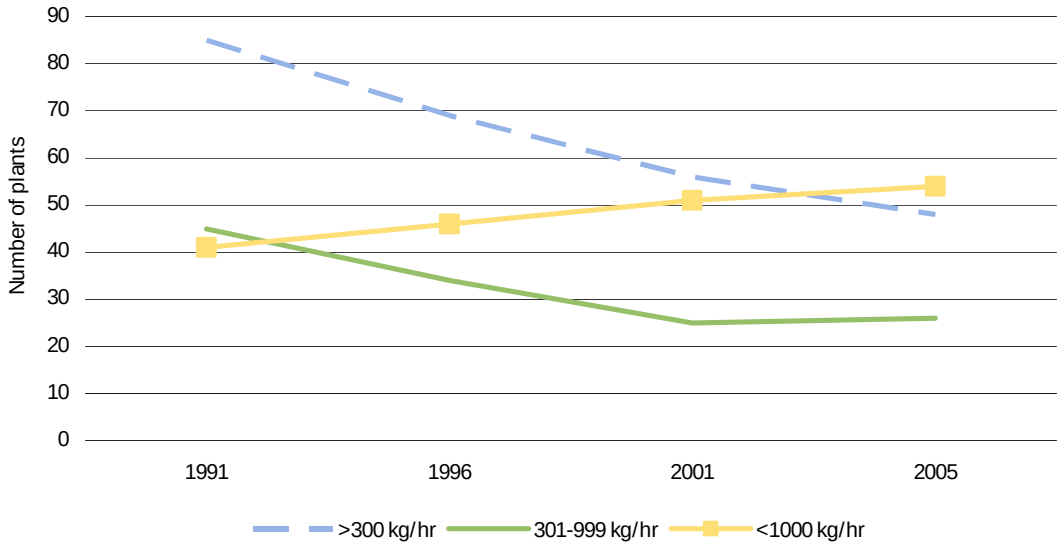
That the size of pasta processing plants is increasing can be observed from Italian data as revealed by Diagram 5.7. The diagram reveals that since 1991, the number of smaller plants processing less than 300kg per hour has fallen, while the number of larger plants has increased. This trend has continued over the review period, but at a slower pace.

Table 5.6: Durum wheat mills and pasta factories by MS

	Durum wheat mills			Pasta factories		
	Pre-reform	Post reform	Change	Pre-reform	Post reform	Change
Italy	138	129	-6%	173	170	-2%
Germany	21	20	-2%	5	5	0%
Spain	11	8	-26%	9	8	-15%
France	9	8	-6%	7	7	0%
UK	6	8	37%	2	2	0%
Greece	7	4	-37%	13	14	8%
Austria	5	na		4	5	19%
Benelux	2	2	-29%	2	2	-9%
Portugal	2	1	-45%	2	2	-9%
Sweden	1	1	0%			
Cyprus					2	
Finland				2	2	-25%
Poland				1	2	50%
Total	200	181	-10%	221	220	-1%

Source: Semouliers and UNAFPA

Diagram 5.7: Italian Pasta Processing Plants by size



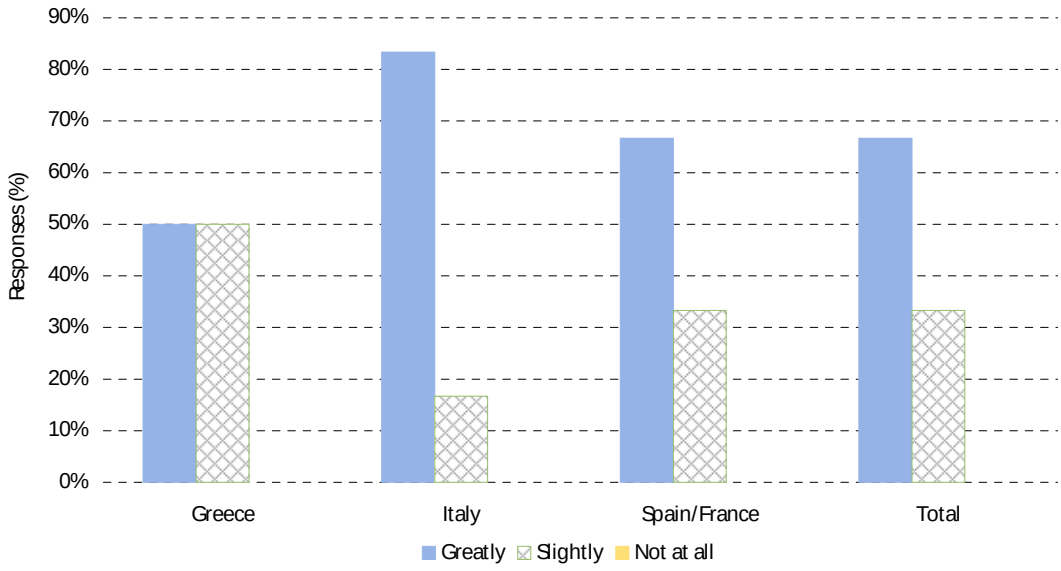
Source: UNIPI

5.7 The importance of sufficient levels of production in traditional areas

5.7.1 Processors' responses

As part of the processor questionnaires, processors were asked whether the objective of ensuring sufficient production is important for the needs of the industry. In the majority of cases, processors reported that this objective was important to them as revealed by Diagram 5.8. This holds in all countries. No-one reported that it had no influence.

Diagram 5.8: Processor Questionnaire, importance of sufficient production



Interviews with processors indicated that the desirability of domestic production is due to the higher, largely transport, costs associated with imports and greater perceived risk, in terms of exchange rate movements and availability. In the latter case, this arises due to the importance of Canadian imports and the monopoly on trade held by the Canadian Wheat Board.

5.7.2 Pasta producers' responses

Other important aspects determining location are proximity to ports and vertical integration. In the former case, this is due to the importance of imports, for instance in France, one pasta producer as part of a re-structuring exercise has closed an old facility located inland in the West of France and moved to Marseille in order to take advantage of proximity to the port to reduce transport costs, both for import and export. This is despite the growing production in non-traditional areas.

5.7.3 Indicative transport costs associated with the importation of durum wheat

One important aspect of ensuring sufficient levels of production is to minimise transport costs. The closer plants are to the production areas (and ports where durum wheat is being imported and products exported), the lower transport costs. An indication of the scale of transport costs can be gleaned by comparing reported import unit values and export unit values. For instance, if Italy were to import durum wheat from Canada rather than produce it in Italy, the additional cost of transport borne by the processor can be measured as the difference between the Canadian export price of durum wheat destined for Italy and the Italian import price for durum wheat from Canada. Italy is the major importing country in the EU, and Table 5.7 reveals average transport costs since 2000/01 for imports from Canada, Spain and France. There is considerable variation in annual import and export unit values. In addition, it is not possible to establish whether these estimates are c.i.f. (cost, insurance and freight) or f.o.b. (free on board). Bearing in mind these limitations, the averages suggest that the indicative cost of shipping a tonne of durum wheat from Canada to Italy is €17.9 per tonne, while costs of shipping from other EU destinations vary between €7 and €4 per tonne. These numbers provide indicative estimates of the minimum level of additional costs that would be incurred in the absence of local production.

Table 5.7: Implied transport costs of imported durum wheat to Italy (€ per tonne)

	€ per tonne
Canada	17.87
Spain	7.05
France	4.27

Source: Eurostat

5.8 Conclusions

EQ3.1 To what extent have the CAP measures supporting durum wheat allowed sufficient levels of production (quality and quantity) at suitable prices with respect to needs of the downstream sectors, and to what extent has the support induced changes in the geographical distribution of the processing industries?

EQ3.2 To what extent is the objective of ensuring sufficient levels of production (quantity and quality) in traditional areas relevant with respect to the user industries needs (e.g. in terms of added value of local production)?

Availability of durum wheat for the EU processing industry has risen slightly following the reform, from around 8.7 million tonnes per year in the period 2000-2004 to 9.3 million tonnes in the years 2005-2008. However, when imports are excluded from the picture, and after accounting for exports, whose share increased post reform, our analysis reveals that the importance of domestic durum wheat production relative to total supply decreased post reform, falling from 88% to 83%. The decline is even more significant for traditional area production, the share of which has changed from 78% pre-reform to 71% post reform.

The importance of imports to meet the requirements of the EU processing industry has increased. Imports as a % of total availability averaged 21% per year post reform, compared with 15% in the years pre-reform.

From a processor's point of view, the most important quality requirement for durum wheat is protein content, followed by specific weight and colour. For most of the processors interviewed across the four case study MS, quality was observed to be unchanged post reform. For Italy, the fragmentation of supply was cited as being the main obstacle to achieving a consistent level of quality in line with the industry's requirements. Imports of high quality durum wheat are required to achieve the desired level of quality. There is no evidence that this is likely to be the case for France, while no clear conclusions could be drawn for Spain. No comparable data are available for Greece.

Price and supply were mentioned by processors as the main reasons for substitution, suggesting that it is fairly easy to switch between domestic and imported durum wheat. This is confirmed by the inverse relationship between the change in production and the change in imports. Analysis of Eurostat data reveals that, in years when production falls, imports rise and *vice versa*. Additional evidence of the existence of a considerable degree of substitutability is provided by the behaviour of US durum wheat prices and durum wheat prices in Italy, the largest durum wheat importer.

Processors are willing to pay a premium to ensure that the domestic supply of durum wheat is in line with their quality requirements. Analysis of the processors' questionnaires revealed that around 70% of respondents pay a quality premium. Of the farmers interviewed, around 40% have a contract with a processor or a trader. Quality was cited as being included in the contract for more than 50% of respondents.

Since 2000/01, the EU processing milling sector has undergone a significant process of consolidation. However, there is no evidence that this process intensified or slowed down as a result of the reform. This outcome was confirmed by the processors' answers to questionnaires, which revealed that the change in regime did not impact the geographical location of their factories.

There is general consensus among the processors interviewed that the objective of ensuring sufficient domestic production is important for the needs of the industry.

Chapter 6: The Effects of CAP Measures on Markets

Evaluation question 4.1: Promoting market stabilisation and EU participation in international trade

Q.4.1.To what extent have the CAP measures promoted market stabilisation and supported EU participation in international trade?

The question covers two different but interconnected issues. The first issue is about market stabilisation. For the purpose of this discussion, this has been defined in two ways: price stability and stability of supply.

The second part of the question covers the EU participation in international trade. This aspect concerns both imports and exports. Given that the EU is a structural net importer of durum wheat and a net exporter of pasta, the aim of this question is to establish how easy it is for processors and pasta producers to both import their durum wheat requirements and export pasta products.

The judgement criteria, indicators and data sources for Question 4.1 are listed in Table 6.1.

Table 6.1: Question 4 judgement criteria, indicators and data sources

Judgement criteria	Indicator	Data Sources	
		Quantitative	Qualitative
Greater price stability, EU versus rest of world	Internal durum wheat prices	Eurostat/DG Agri/Case Studies	Producers' questionnaires
	World durum wheat prices	Canada Wheat Board, US Wheat Association, IGC, USDA	
	Trends in EU import and export unit values	Eurostat	
Usage of EU durum wheat by the processing industry	EU durum wheat used by processing industry as % of durum wheat milled	Union of the Associations of Semouliers of the EU, Eurostat	Processor Inteviews
	Imports used by processing industry as % of durum wheat milled		
Importance of EU production to global production and trade	Global and EU Production	Eurostat/IGC /DG Agri/FAO/USDA	
	Extra EU exports as % of global exports	Eurostat, International Grains Council	
	Extra EU imports as % of global imports	Eurostat, International Grains Council	
Changes in level of exports	Trends in durum wheat exports	Eurostat	
	Trends in pasta exports	Eurostat	
	Trends in export refunds for non-annex 1 products	DG Agri	
Changes in level of imports	Market trends in import of DW	Eurostat	
	Trends in TRQ for pasta	DG Agri	
	Tariff levels on non-annex 1 products		

6.1 Relevant CAP measures

Besides the measures to decouple payments introduced in the Mid Term Review, pre-dating CAP measures that are relevant to this discussion are:

- The system of intervention buying, which provides a floor to domestic durum wheat prices, has remained at €101.31 per tonne since 2001/02. However, the market price for

durum wheat has traded above the intervention price over the review period. As a result, no intervention buying of durum wheat has occurred.

- In addition to intervention, border measures were retained under the Mid Term Review. Imports of durum wheat remained subject to a variable import levy system, which differentiates between three categories of durum wheat: high quality, medium quality and low quality[26]. The import duty is calculated as the difference between a "world" price and the EU internal price, equating to 155% of the intervention price adjusted for the "storage premium". The duty cannot exceed €148 /tonne, which is the WTO bound rate of duty. The import duty on durum wheat has been €0 per tonne since July 2000.
- Most favoured nation (MFN) import duties on pasta products have been unchanged since 2000.[27] A Tariff Rate Quota of 532 tonnes was introduced on pasta products in 2006 in response to the accession of the new MS.
- Finally, the system of export refunds for Annex 1 and non-Annex 1 products (pasta) affects the competitiveness of EU products on the world market. This is constrained by the export commitments agreed under the WTO. Since February 2000, there have been no export refunds payable on Annex and non-Annex 1 products.

6.2 Market stabilisation

6.2.1 Effects of the CAP measures on price stability

With regard to durum wheat prices, it is important to note that the fragmentation of the market in some of the main producing MS means that pricing systems for different markets, qualities and over time are rarely consistent. While published quotations are used as a guide for price formation, they rarely correspond to the actual prices at which durum wheat is sold.

The following analysis is based on price data provided by DG Agri for a number of markets in the EU.

[26] High and medium quality durum must have a minimum specific weight of 76.0 kg/hectolitre and a maximum impurity percentage (Schwarzbesatz) of 1.5%. The difference between high, medium and low quality is defined by Hard Vitreous Kernel (HVK) content. High quality must have a minimum HVK content of 75.0%.

[27] The following Table shows the prevailing import duties

HS 8 digit code	Description	Country of origin	Duty	Regulation	Effective from
19021910	Uncooked pasta, excluding common wheat or eggs	erga omnes	7.70 % + 24.60 EUR / 100 kg	2204/99	01/01/2000
19021990	Uncooked pasta containing common wheat	erga omnes	7.70 % + 21.10 EUR / 100 kg	2204/99	01/01/2000
19021110	Uncooked pasta, containing eggs	erga omnes	7.70 % + 24.60 EUR / 100 kg	2204/99	01/01/2000
19022010	Stuffed pasta, containing fish	erga omnes	8.50 %	2261/98	01/01/1999
19022030	Stuffed pasta, containing meat	erga omnes	54.30 EUR / 100 kg	2204/99	01/01/2000
19022091	Cooked, stuffed pasta	erga omnes	8.30 % + 6.10 EUR / 100 kg	2204/99	01/01/2000
19022099	Stuffed pasta, otherwise prepared	erga omnes	8.30 % + 17.10 EUR / 100 kg	2204/99	01/01/2000
19023010	Dried, prepared pasta	erga omnes	6.40 % + 24.60 EUR / 100 kg	2204/99	01/01/2000
19023090	Pasta, cooked	erga omnes	6.40 % + 9.70 EUR / 100 kg	2204/99	01/01/2000
19024010	Couscous, unprepared	erga omnes	7.70 % + 24.60 EUR / 100 kg	2204/99	01/01/2000
19024090	Couscous, prepared	erga omnes	6.40 % + 9.70 EUR / 100 kg	2204/99	01/01/2000

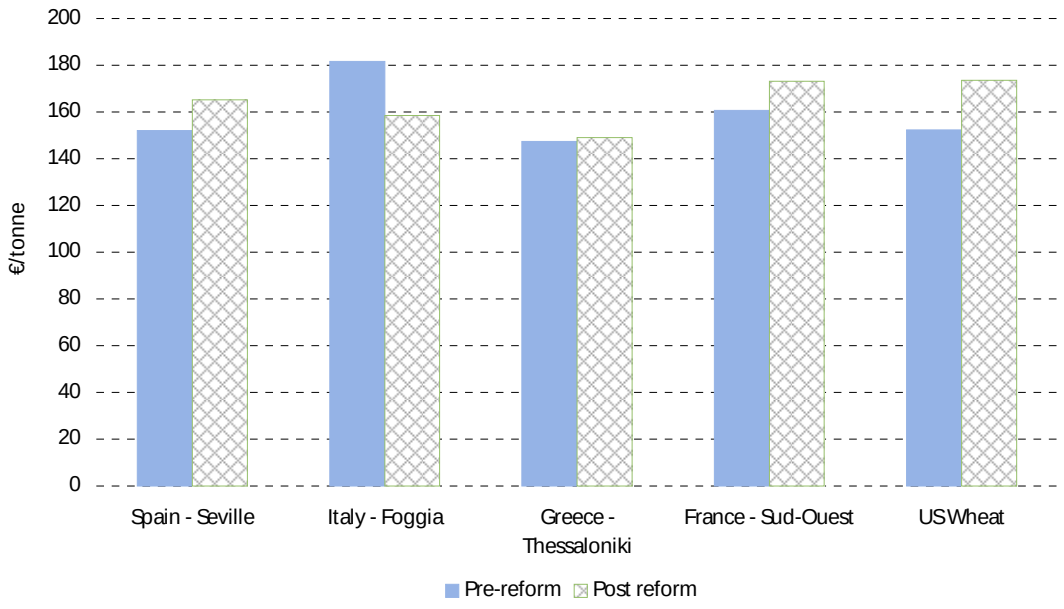
Trends in market prices

The findings of our analysis are fairly inconclusive. For Italy, there is evidence that price stability was greater in the years post-reform than in the period pre-reform. In contrast, in the three other case study MS, the volatility of prices is higher in the years following the changes in the CAP measures.

Based on this evidence alone, we cannot infer whether the changes in the 2003 CAP measures have had any effect on stabilising the price of durum wheat in the internal market. In addition, the pre-dating measures of intervention buying and export refunds were not used by the Commission in the review period. In light of this, any changes that affected the EU market are attributable to the impact of external factors rather than to the effect of policy measures.

The results of our investigation are presented in Diagrams 6.1 to 6.3. The diagrams compare the mean level of annual prices for the case study MS and world prices (defined as US wheat prices) and present two indicators of price stability: the coefficient of variation of annual prices (calculated as the standard deviation of monthly prices divided by the mean annual price) and the maximum-minimum ranges of annual prices as percentage of the mean prices.

Diagram 6.1: Means of EU and US durum wheat prices



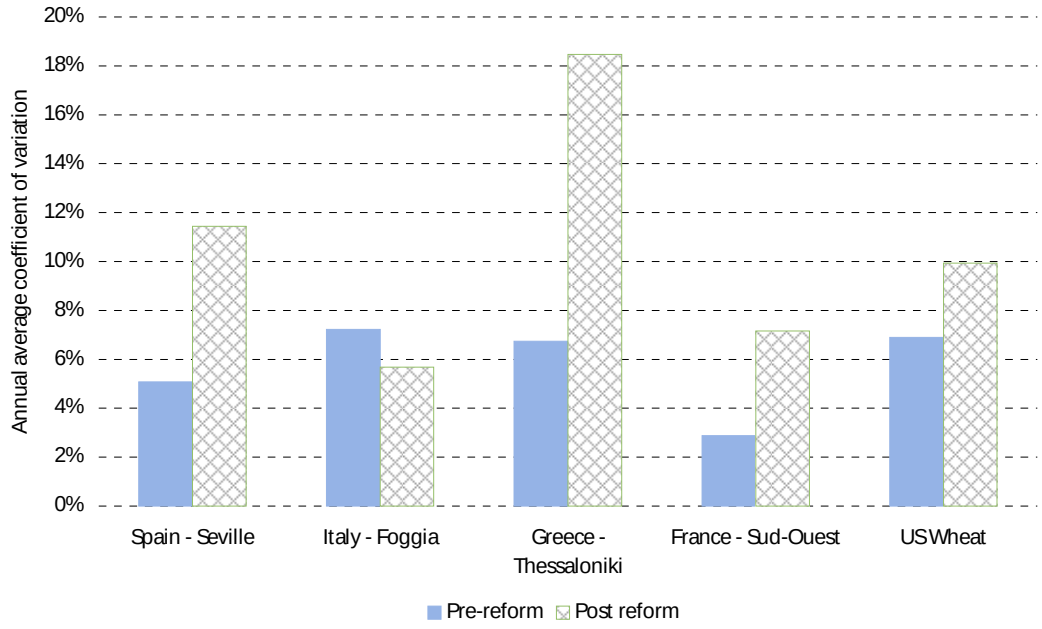
Source: DG Agri, International Grains Council

For the purpose of this discussion, it is important to point out the effect of the experience of commodity markets in 2007/08, which caused durum wheat prices to rise considerably to level well above historical averages in a very short period of time, leading to an unusually high level of price volatility. In our interviews with durum wheat producers, there was evidence of this as prices received by growers varied significantly depending upon when the crop was marketed[28]. In light of this consideration, in our analysis, we exclude 2007/08. The key point to note is that when including 2007/08, while the mean level of prices is biased upwards, the pattern of price relativities between the period pre reform and two periods post reform (with and without 2007/08) is similar.

[28] With regard to this, evidence collected during interviews indicated that the introduction of the Single Farm Payment (SPF) has changed the balance of risk for producers. In France, for example, the SPF is paid in early December and covers most of the cost of production, meaning that farmers are less likely to incur losses when selling their crop. This consideration leads them to adopt a more risky behaviour.

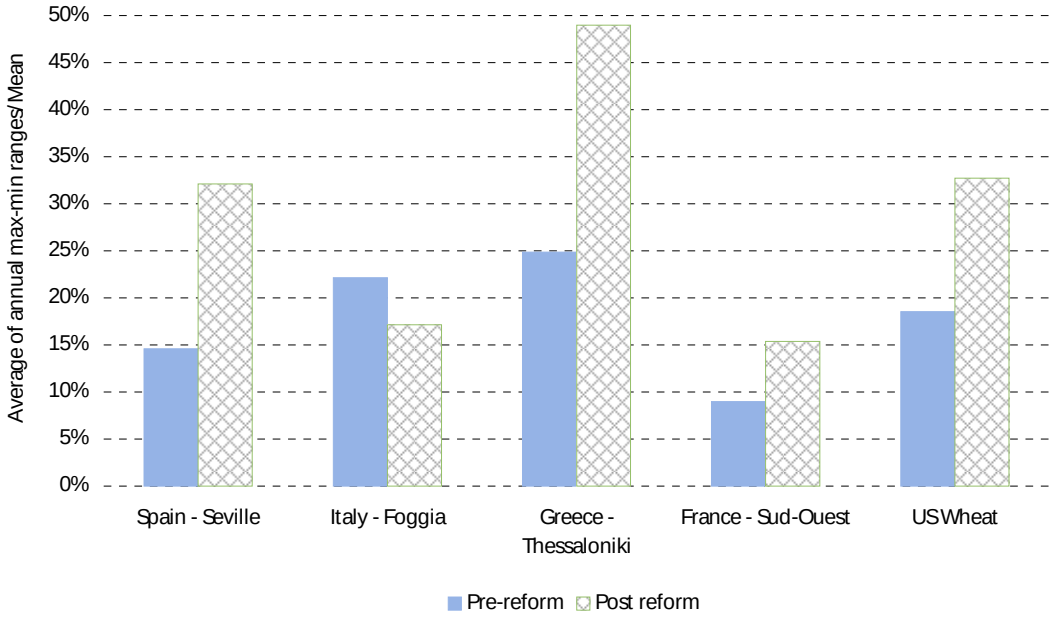
Diagram 6.1 shows that mean values of prices pre-and post-reform tend to be broadly similar across the case study MS and in line with US (world) market prices.

Diagram 6.2: Coefficient of variation, EU and world durum wheat prices



Source: DG Agri, International Grains Council

Diagram 6.3: Maximum -minimum range, EU and world durum wheat prices



Source: DG Agri, International Grains Council

In terms of stability, our findings indicate that this was smaller in the years pre-reform than post reform for Spain, Greece and France (Diagrams 6.2 and 6.3). This contrasts with the evidence provided by the analysis of the Italian data. These data reveal that the stability of Italian prices was greater in the years following the introduction of the 2003 CAP measures; both the coefficient of variation and the max-min range are significantly lower in the years post reform.

Trends in import and export unit values

Diagram 6.4 depicts the trends in import and export unit values for durum wheat for the EU 27 (excluding intra EU trade). The diagram shows that they track each other very closely. The average annual differential between export values and import values is estimated at around €4/tonne per year, reflecting the higher quality of durum wheat imported.

Diagram 6.4: EU27, import and export unit values

Source: Eurostat

6.2.2 Stability of supply

In terms of market stabilisation defined as stability of supply, the hypothesis underlying our analysis is that the 2003 CAP measures promoted stability of supply when the share of imported durum wheat processed by the EU processing industry remained broadly stable over time.

As discussed in Chapter 5, imports are a crucial element of supply for the EU durum wheat processing sector, particularly in Italy. They ensure that the milling industry is able to meet the quality standards required by the downstream sector, particularly in years when the quality of the domestic crop is quite poor. It is therefore important that the CAP measures ensure that the milling industry operates in an open market where it can access external sources of supply in response to changing market conditions.

The findings of our examination indicate that durum wheat imports have accounted for a fairly stable share of EU food use, at between 10% and 20% per year, since 2000/01. There are no indications that the implementation of the 2003 CAP measures has had a discernible impact on the level and share of imports besides the annual fluctuations resulting from changes in the harvest conditions from year to year.

Diagram 6.5 charts the evolution of the shares of durum wheat imports and domestic production used by the EU milling sector. Between 2000 and 2004, imports accounted for a relatively stable share of total food use at around 15%. In the years 2005 to 2007, this share increased to around 20%, falling to 10% in 2008.

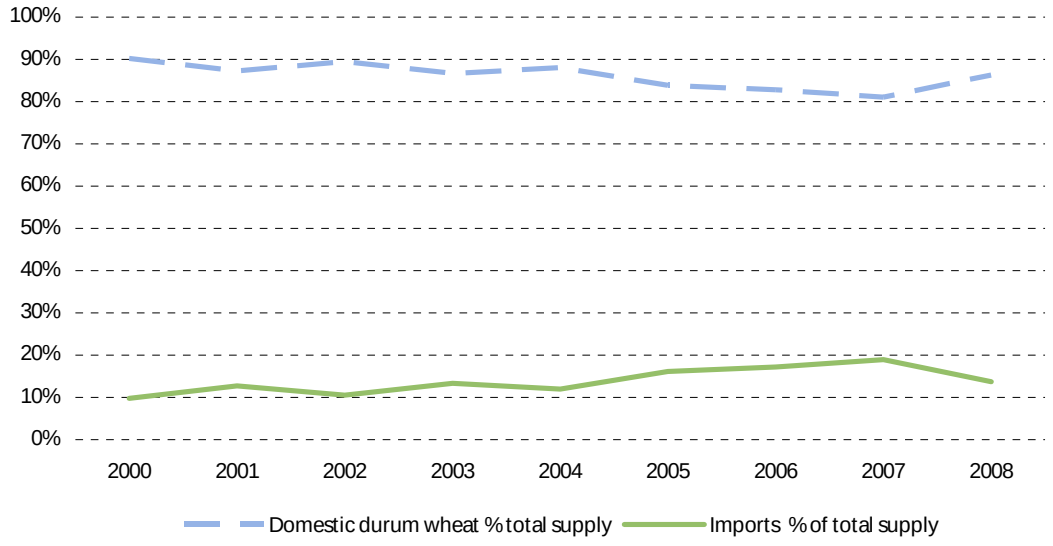
When this evidence is combined with the information presented in Diagram 6.5, it reveals that, while the volume of imports changes from year to year, the EU milling sector relies on durum wheat imports even in years when the level of domestic production would allow the industry to reach self sufficiency. This is mainly due to the large volumes of third country durum wheat

imported into Italy. Quality issues are the main reason for this. In Italy, imports of high quality durum wheat are used to raise the overall quality of the final product (durum wheat flour) to meet the standards required by the downstream sector.

A point worth noting is that the rise in prices in 2007/08, led to an extreme, if temporary, disruption of supply, as producers held on to their stocks in the hope that prices would continue to rise. This meant that the sector was, for a number of months, operating under uncertain conditions in terms of raw material prices and volume of supply.

Based on the evidence presented in this discussion, we cannot infer that the 2003 CAP measures promoted market stabilisation, when this is interpreted as stability of supply, relative to the period pre-reform. At the same time, the changes brought about by the 2003 reform did not interfere with the market's own stabilisation mechanism (changes in the level of imports following changes in the domestic supply of durum wheat, both in terms of quantity and quality).

Diagram 6.5: EU domestic production and imports processed by the EU milling sector



Source: Eurostat, Semouliers, ONIGC

Diagram 6.6: Trends in EU domestic production, imports and food use

Source: Eurostat, Semouliers

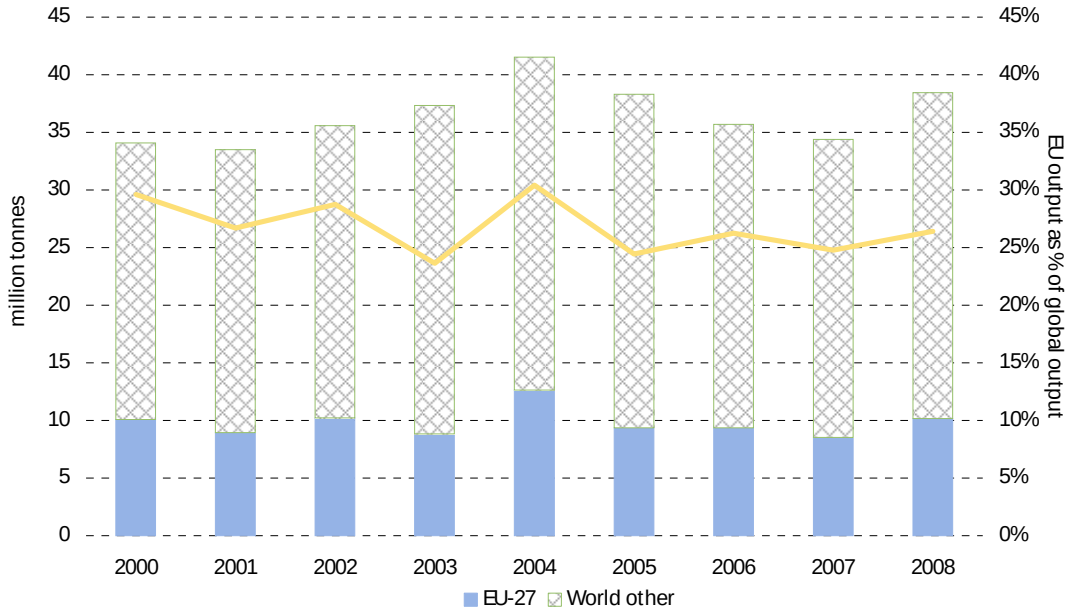
6.3 EU participation in international trade

There are two ways in which the CAP measures affect the EU participation in world trade. One is through their impact on the supply of durum wheat, which determines the deficit/surplus of this product when contrasted with internal demand. The second is the extent to which refunds are needed for exports to be made.

6.3.1 Importance of EU production to global production

In terms of production, Diagram 6.7 reveals since 2005, EU's output share has declined to 25%, remaining virtually unchanged over the following four years. While this is lower than the global share of production accounted for by the EU in previous years, it is not significantly out of line with the historical trend. Based on this evidence, the 2003 CAP measures have not improved the share of EU durum wheat production on the world market.

Diagram 6.7: Global and EU production of durum wheat



Source: Eurostat, International Grains Council

6.3.2 Importance of EU production to international trade

Imports

Table 6.2 presents the evolution of EU and world import of durum wheat and durum wheat flour (excluding intra EU trade).

Table 6.2: Global and EU imports of durum wheat and durum wheat flour ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU-27	1,127	1,325	1,214	1,361	1,715	1,810	1,954	2,004	1,629
World other	5,562	6,082	6,230	5,450	5,362	5,479	5,370	5,917	5,412
Global Imports	6,689	7,407	7,443	6,810	7,077	7,289	7,324	7,921	7,041
EU imports as % of global	17%	18%	16%	20%	24%	25%	27%	25%	23%

Note: Pre-reform consists of the years 2000-04, post reform 2005-2008
Source: Eurostat, IGC

Global imports (and therefore trade) total, on average, around seven million tonnes per year. Since 2000/01, EU imports have shown an increasing trend, increasing to an annual average of 1.8 million tonnes post reform. Of this, durum wheat flour imports account for a negligible share, at around 1% per year. In percentage terms, the EU's share of global imports has increased significantly, rising from around 19% pre-reform to around 25% post reform.

As cited above, processors are able to substitute imports for domestic production. Quality and supply were both mentioned by processors as the main reasons for this, suggesting that it is fairly easy to switch between domestic and imported durum wheat. This is confirmed by the inverse relationship between the change in production and the change in imports. Analysis of Eurostat data reveals that, in years when production falls, imports rise and *vice versa*.

The import duty on durum wheat has been at €0 per tonne since July 2000. This has allowed the processing sector to access imports as required by market conditions in each particular year.

Exports

In terms of exports, Table 6.3 shows the evolution of EU and global exports of durum wheat and durum wheat flour over the review period (excluding intra trade). In absolute values, EU exports have risen significantly between 2000 and 2008, albeit from a small starting point, peaking at around 1.1 million tonnes in 2005. In terms of export share, pre-reform, EU exports were around 8% of total exports. This share has risen steadily, with post reform exports averaging 13% of global exports.

The system of export refunds, which pre-dated the 2003 reform, was retained during the reform. Since 2 January 2000, durum wheat exports were made without the benefit of export refunds, while for durum wheat semolina, which accounts in volume for around 1% of total exports, export refunds have been zero since February 25, 2000.

Table 6.3: Global and EU exports of durum wheat and durum wheat flour ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post reform
EU-27	275	342	622	805	864	1,079	1,020	884	958	581	986
World other	6,414	7,065	6,821	6,006	6,213	6,210	6,304	7,037	6,082	6,504	6,408
Global exports	6,689	7,407	7,443	6,810	7,077	7,289	7,324	7,921	7,041	7,085	7,394
EU exports % of global	4%	5%	8%	12%	12%	15%	14%	11%	14%	8%	13%

Source: Eurostat, International Grains Council

Pasta exports

The trends in exports of pasta and couscous over the period 2000-2008 are presented in Tables 6.4 and 6.5, on a tonne and grain equivalent basis, respectively. The tables reveal that exports of pasta and couscous total around 660,000 tonnes per year, although they fluctuate significantly from year to year. When these export volumes are expressed on grain equivalent basis, they equate to around 710,000 tonnes per year. Uncooked pasta containing durum wheat accounts for the overwhelming majority of exports, at around 530,000 tonnes per year. The fall in exports in 2008 is attributed to lower exports to the US as one Italian processor opened a production facility in the US, thus reducing the need for exports. Exports of uncooked, non stuffed pasta, have remained stable over time. On the other hand, exports of cooked and stuffed pasta, which account for a small share of pasta trade, have been on an upward trend since 2000.

In terms of CAP measures pre-dating the 2003 reform, export refunds on non-Annex 1 products have not been used since February/March 2000.

Pasta Imports

Imports of pasta into the EU 27 are subject to the import duties presented above in this chapter. Exceptions to *erga omnes* duties apply to imports originating in a number of countries. For many of these origins, access to the EU market is duty free. The evolution of pasta imports over the review period is presented in Table 6.6. The table reveals that, when compared with pasta exports, pasta imports into the Community are relatively small. However, since 2000, they have followed an upward trend, virtually doubling between the start and end years of the review period. The largest increase occurred in imports of dried, prepared pasta. This upward trend can be considered an indication of the fact that the market has become increasingly open.

Impact of the 2003 measures on the importance of EU production to international trade

The analysis presented shows that, in terms of broader CAP measures pre-dating the 2003 reform, these have facilitated the EU' participation in the international trade, both inwards and outwards, ensuring the openness of the EU durum wheat market. Similar considerations apply to trends in trade of pasta and couscous.

The 2003 measures supported the EU's participation in international trade by ensuring the positive growth of inward and outward trade.

6.4 Conclusions

Q.4.1.To what extent have the CAP measures promoted market stabilisation and supported EU participation in international trade?

In terms of market stabilisation, our assessment distinguishes between stability of prices and stability of supply.

- There is no clear evidence that the 2003 CAP measures promoted price stability within the EU market. While in Italy, stability of prices was greater following the implementation of the measures in 2005, as revealed by the coefficient of variation and the max-min range applied to Italian annual price data, for all other case study MS, namely France, Greece and Spain, our findings reveal that stability was greater in the years before the implementation of the reform.

- With regard to stability of supply, imports are a crucial element for the EU processing sector as they help reach the level of quality required by end users (as discussed in Chapter 5) and cover any shortfall in production. Since 2000/01 the share of durum wheat imports used by the EU milling sector has increased. This suggests that the measures have not promoted stability of domestic supply, but it can nevertheless be concluded that the measures have not interfered with the ability of the processing sector to access the world market.

In terms of EU participation in international trade, the conclusions of our discussion are that:

- In terms of durum wheat production, the EU's share of world output has remained fairly stable over the years 2000-2008. Although it declined slightly in the period 2004 to 2008, this value is not significantly different from the trend followed in the period pre-reform. Based on this evidence alone, it cannot be claimed that the 2003 CAP measures have improved the share of EU durum wheat production on the world market.

- Over the review period, EU imports of durum wheat have increased significantly. This outcome is attributable to the absence of import duty on durum wheat, which has facilitated the participation of the EU in the international trade arena, by allowing processors to access imports as required by market conditions in each particular year.

- Like imports, exports of durum wheat have also risen significantly, albeit from very small starting volumes. While the system of export refunds, pre-dating the 2003 reform, was retained, the percentage of durum wheat exports made with export refunds has been virtually 0% since 2000. This can be explained as the effect of the reduction in price support (introduced before the 2003 reform) which, by aligning EU internal prices with world market prices, facilitated the exports without export refunds.

- Pasta exports have remained fairly stable over the review period, at just below 0.7 million tonnes, *tel quel*. The 2003 CAP measures do not seem to have had any discernible effect on exports of pasta and couscous. Like durum wheat exports, all pasta exports were made without the benefit of export refunds.

- The increase in trade volumes, both inwards and outwards, is attributable to changes in the broader CAP framework, introduced prior to the 2003 reforms. There are no indications that the 2003 reform interfered with the positive growth trends prevailing in the sector. Based on this consideration, it could be argued that the 2003 measures supported the EU's participation in international trade.

Table 6.4: Pasta and cous cous exports (tonnes, *tel quel)*

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Uncooked pasta, containing common wheat	69,911	70,308	67,070	72,706	66,940	64,377	66,173	61,269	62,933
Uncooked pasta, containing eggs	15,692	15,039	14,973	15,759	18,395	29,273	19,366	20,912	21,705
Uncooked pasta, containing durum wheat	513,343	552,942	560,491	520,171	518,676	534,027	537,500	541,371	497,764
Pasta, stuffed with meat	122	166	95	76	83	99	207	387	172
Pasta, stuffed with fish	654	1,085	1,016	2,459	2,099	1,408	1,205	1,697	1,162
Cooked pasta	7,273	9,616	9,441	9,381	14,722	14,899	17,754	21,064	21,198
Cooked pasta, containing meat or fish	3,527	3,263	4,365	4,363	6,723	7,838	11,102	12,989	12,234
Dried, prepared pasta	9,167	11,008	10,523	8,852	8,925	8,340	6,790	6,362	6,128
Pasta, otherwise prepared, stuffed with meat	4,610	5,543	8,009	10,904	9,878	9,991	10,751	13,085	12,762
Pasta total	624,299	668,969	675,984	644,672	646,440	670,250	670,849	679,136	636,057
Couscous, unprepared	5,525	5,843	5,823	5,283	5,237	4,912	5,398	5,963	5,930
Couscous, cooked	882	1,605	1,365	1,789	2,101	2,545	2,926	3,617	4,317
Couscous total	6,407	7,448	7,189	7,072	7,338	7,457	8,324	9,580	10,247
Gran total	630,706	676,417	683,172	651,744	653,777	677,707	679,172	688,717	646,304

Source: Eurostat

Table 6.5: Pasta and cous cous exports (tonnes, grain equivalent)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Uncooked pasta, containing common wheat	73,826	74,245	70,826	76,778	70,688	67,982	69,879	64,700	66,457
Uncooked pasta, containing eggs	16,571	15,881	15,812	16,642	19,425	30,912	20,451	22,083	22,920
Uncooked pasta, containing durum wheat	542,090	583,906	591,878	549,301	547,721	563,932	567,600	571,688	525,639
Pasta, stuffed with meat	103	140	80	64	70	84	175	327	146
Pasta, stuffed with fish	552	916	859	2,078	1,773	1,189	1,018	1,434	982
Cooked pasta	6,145	8,124	7,976	7,925	12,437	12,586	14,998	17,795	17,908
Cooked pasta, containing meat or fish	2,980	2,756	3,687	3,686	5,679	6,621	9,379	10,973	10,335
Dried, prepared pasta	13,750	16,512	15,785	13,278	13,387	12,510	10,185	9,542	9,192
Pasta, otherwise prepared, stuffed with meat	6,914	8,315	12,014	16,357	14,817	14,986	16,127	19,628	19,143
Pasta total	662,931	710,795	718,916	686,108	685,999	710,803	709,812	718,170	672,721
Couscous, unprepared	8,288	8,764	8,735	7,924	7,855	7,368	8,097	8,945	8,896
Couscous, cooked	1,322	2,407	2,048	2,684	3,151	3,817	4,388	5,425	6,475
Couscous total	9,610	11,172	10,783	10,608	11,006	11,186	12,486	14,370	15,371
Grand total	672,541	721,967	729,699	696,716	697,005	721,988	722,297	732,540	688,091

Source: Eurostat

Table 6.6: EU 27 Pasta and couscous imports (tonnes, *tel quel*)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Uncooked pasta, containing common wheat	5,908	6,443	6,715	8,891	9,371	7,799	8,305	7,674	9,160
Uncooked pasta, containing eggs	10,730	10,422	8,589	7,198	6,839	6,251	6,149	6,997	7,057
Uncooked pasta	7,653	7,706	8,883	9,866	12,099	10,256	9,269	11,279	13,891
Pasta, stuffed with fish	397	329	259	411	564	866	1,062	1,330	1,575
Pasta, stuffed with meat	52	68	13	39	92	102	87	228	414
Cooked pasta, stuffed with meat	7,435	8,160	9,842	10,292	11,763	11,434	11,451	12,685	15,644
Pasta, cooked or otherwise prepared	10,191	10,880	10,701	10,441	13,524	18,953	21,164	25,483	27,511
Pasta, otherwise prepared, uncooked	1,535	1,117	1,214	1,343	1,888	2,772	2,785	3,581	4,065
Dried, prepared pasta	35,015	38,205	51,312	54,629	62,835	67,257	74,025	88,241	91,685
Couscous, unprepared	1,177	1,773	1,724	2,582	3,156	4,122	3,537	4,818	5,516
Couscous, prepared	237	284	656	862	930	1,177	1,258	1,508	1,285
Total	80,331	85,385	99,907	106,553	123,059	130,988	139,092	163,825	177,802

Source: Eurostat

Chapter 7: The Effect on Rural Areas

Evaluation question 5: Promoting rural development

EQ5.1. To what extent have the CAP measures supporting durum wheat promoted rural development in traditional areas with respect to employment and economic viability?

As the question implies, rural development is defined in terms of employment and economic viability. This is assessed both at farm level and at the processing level.
At farm level, employment is determined by the number of farms producing wheat and the use of unpaid and paid labour.

The extent to which employment has been affected by the policy also depends upon the labour use for durum wheat as compared to alternative crops, a switch away from durum wheat to more labour intensive products will have increased employment and vice versa.

Employment generated by the processing industry depends upon the number of processing units, employment per factory and the location of the processing units.

The extent to which economic viability in the traditional areas has been affected by changes in the measures depends upon the importance of durum wheat to the total agricultural outcome. Economic viability is dependant upon whether the returns are sufficient to ensure the continuation of production. Building on the analysis of Chapter 4, returns are calculated in terms of gross margins and the return to labour. The economic viability of durum wheat production is maintained, in the extreme case, when the gross margin and return to labour remain positive, and where gross margins and returns are higher than those of alternative crops. The judgment criteria used in this discussion are shown in Table 7.1.

Table 7.1: Question 5 judgement criteria, indicators and data sources

Judgement criteria	Indicator	Data Sources	
		Quantitative	Qualitative
Importance of durum wheat to total ag outcome	Durum wheat income % of total agricultural income	Eurostat	
Level of farm employment	Number of durum wheat farms	FADN	Farmers' questionnaires
	Level of unpaid and paid labour	FADN	Farmers' questionnaires
	Importance of durum wheat to total labour time	FADN	Farmers' questionnaires
Change in farm employment	Labour use per hectare, area under durum wheat and alternative crops	FADN	Farmers' questionnaires
Returns to labour, DW versus alternative crops	Wages paid per hectare,	FADN	Farmers' questionnaires
Changes in gross margins	Gross margins	FADN/Case studies	Farmers' questionnaires
Labour requirements of the processing industry	Numbers employed per factory, by size, by MS	Industry Associations	Processing questionnaire
Change in processing employment by MS	Level of employment in processing industries	Industry Associations	Processing questionnaire
Change in the location of processing industry by MS	Number of mills and pasta processors by year by MS	Industry Associations	Processing questionnaire

7.1 Importance of durum wheat to total agricultural output

In terms of value, since 2000/01, durum wheat output averaged €5 billion per year, while the value of total agricultural production stood at around €456 billion (Table 7.2). In percentage terms, durum wheat contribution to total agricultural output equates to 1.1% pre-reform. This fell to 0.7%, post-reform. At a regional level, our analysis shows that the contribution of durum wheat production to the total agricultural output in traditional production zones is much higher

than the EU average, averaging 4.8% prior to the reform. Post reform, the durum wheat share fell to 3.7%.

Table 7.2: Value of total agricultural output and durum wheat production, 1999/00-2005/06 (million euros)

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Pre-reform	Post reform
EU-27									
Total Ag. output	444,355	454,735	458,823	453,392	483,738	475,336	421,536	459,009	448,436
Durum wheat	5,084	5,057	5,174	4,743	5,546	4,058	2,531	5,121	3,295
DW share	1.1%	1.1%	1.1%	1.0%	1.1%	0.9%	0.6%	1.1%	0.7%
Traditional Areas									
Total Ag. output	40,753	40,621	41,501	42,988	40,891	39,309	39,039	41,351	39,174
Durum wheat	2,042	2,068	1,912	2,196	1,653	1,406	1,468	1,974	1,437
DW share	5.0%	5.1%	4.6%	5.1%	4.0%	3.6%	3.8%	4.8%	3.7%

Source: Eurostat
Note: Does not include data for Spain and Portugal. Full data are not available after 2005/06.

7.2 Total farm employment

7.2.1 Number of durum wheat farms

Eurostat data reveal that there were 490,000 durum wheat farms in the EU-27 in 2005. Data by country are shown in Table 7.3. The series is published every two years. No information on the distribution of durum wheat farms at a regional level is available in the Eurostat survey.

Table 7.3: Durum wheat producing farms

	2003	2005	2007	% change 2007 vs. 2003
Austria	4,200	3,780	3,820	-9%
Cyprus	2,780	2,340	1,960	-29%
France	38,420	40,940	44,220	15%
Germany	1,660	1,860	1,460	-12%
Greece	280,960	285,800	n.a.	n.a.
Hungary	620	700	200	-68%
Italy	605,400	536,460	514,100	-15%
Portugal	7,460	2,720	620	-92%
Romania	5,220	5,680	1,200	-77%
Slovakia	80	100	80	0%
Spain	99,040	100,340	n.a.	n.a.

Source: Eurostat

Analysis of the data reveals that the number of farms fell in most countries in 2007 compared with 2003. The decline was most dramatic in the EU-12, where, following the accession, the number of farms growing durum wheat declined in all MS covered by the survey. Among the EU-15, France was the only MS where the number of farms increased.

When assessed in absolute terms, among the EU-12, the number of durum wheat holdings declined by around 4,000 units in Romania. In Cyprus and Hungary, the fall was around 820 and 420 holdings, respectively.

Among the EU-15, the number of durum wheat farms increased by around 5,800 units in France, while it declined by more than 91,000 farms in Italy. Portugal also witnessed a sizeable decline, with just below 7,000 farms leaving the sector.

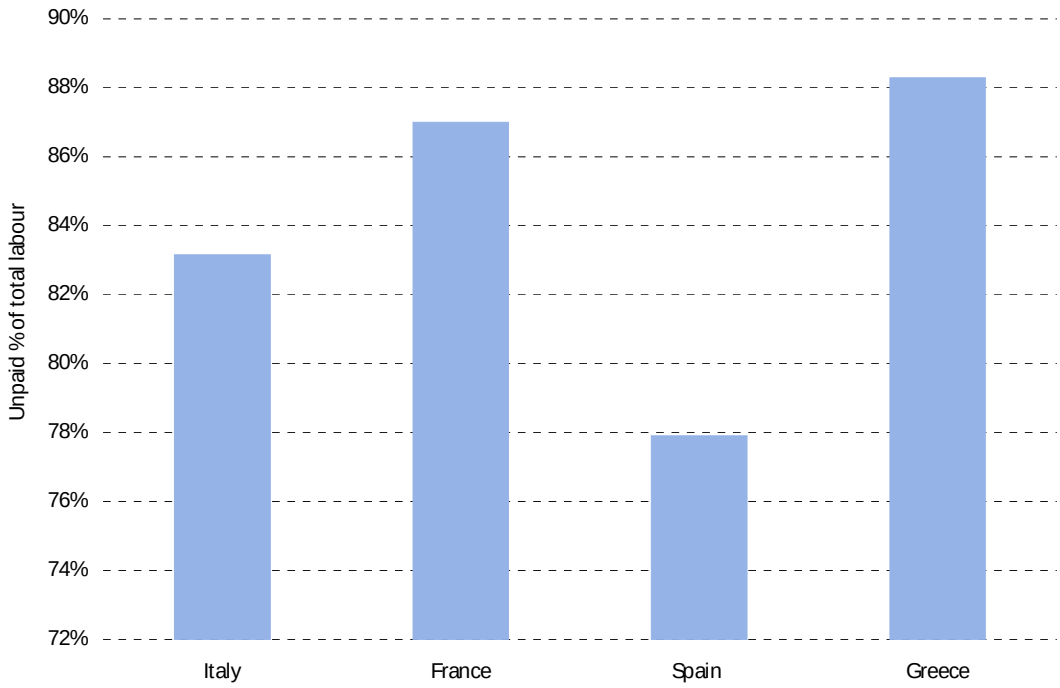
Overall, the number of durum wheat farms in the EU-27 MS surveyed declined by just below 100,000 units between 2003 and 2007.

While the number of farms has declined, average farm sizes have increased, as discussed in Chapter 4 (see Table 4.24). The impact on employment then depends upon how labour requirements change with changes to farm size. The FADN data for Italy where the sample size is sufficiently large to split costs by farm size reveals that per hectare requirements for durum wheat fall as size increases as shown in Table 7.4. Over the period 2000 to 2006 for which FADN data are available per hectare labour requirements fall from 256 hours per hectare for farms under 10 hectares, to 128 hours for farms of 10 to 20 hectares, 80 hours for farm of 20 to 50 hectares and 39 hours for farms of greater than 50 hectares.

7.2.2 Labour Use

Employment on these farms comprises family labour (unpaid labour) and paid labour. For durum wheat specialists, the FADN data suggest that farm employment is dominated by unpaid labour. This is the case pre- and post reform. In all countries, unpaid labour accounts for over 75% of total labour use (expressed in hours per hectare) as shown in Diagram 7.1. Across countries, the level of unpaid labour averaged 83% of total labour use on a weighted average basis, pre-reform and 84% post reform.

Diagram 7.1: Unpaid Labour Use (hours per hectare)



Source: FADN

7.2.3 Importance of durum wheat to total labour time

While durum wheat production is estimated to generate employment for over half a million people, it does not require full time employment. The FADN data give an indication of total hours of labour use (paid and unpaid) for one hectare of durum wheat on farms specialising in durum wheat production.

On average, during the period 2000-2006, total labour use per hectare was greatest in Greece (119 hours), followed by Italy (76 hours), Spain (41 hours) and France (31 hours). This is equivalent to between 2% and 8% of annual available hours for one person[29]. In all cases,

[29] Based on 220 working days per annum and a 7 hour working day.

within the FADN sample, labour use has fallen since the reform, although, this may be a reflection of the change in the composition of the sample. As a result, it is not possible to infer whether this trend was caused by the changes brought about by the 2003 reform.

For countries where we are able to examine trends for a cohort of farms, the evidence is that in Italy, the number of hours increased, while in Greece they decreased.

A breakdown of labour use between paid and unpaid labour reveals that, over the period 2000-2006, unpaid labour use averaged 105 hours in Greece. This was followed by Italy at 63 hours per hectare, Spain at 36 hours per hectare and France at 24 hours per hectare.

In terms of paid labour, the use is similar in Greece and Italy at around 13-14 hours per hectare. In France and Spain, paid labour use is limited, at 7 and 5 hours per hectare, respectively.

Multiplying the total FADN requirements per hectare (presented above) to the total area under durum wheat gives an indication of total labour requirements for durum wheat and how this changed since 2004. The results are shown in Table 7.4. The table distinguishes between total labour, paid and unpaid labour.

Using this limited methodology, the table shows that, following the reform, with a lower area under durum wheat total labour requirements have fallen from around 36,500 days to just below 30,600 days. In terms of unpaid labour, the requirements changed from just over 31,100 days to around 26,000 days. Paid labour requirements declined from 5,400 days pre-reform to around 4,500 days post-reform. This analysis does not include changes resulting from the increase in farm size.

These estimates suggest that, to the extent that the 2003 measured had a negative impact on the area planted to durum wheat, they did not promote employment in rural areas.

Table 7.4: Total durum wheat labour requirements

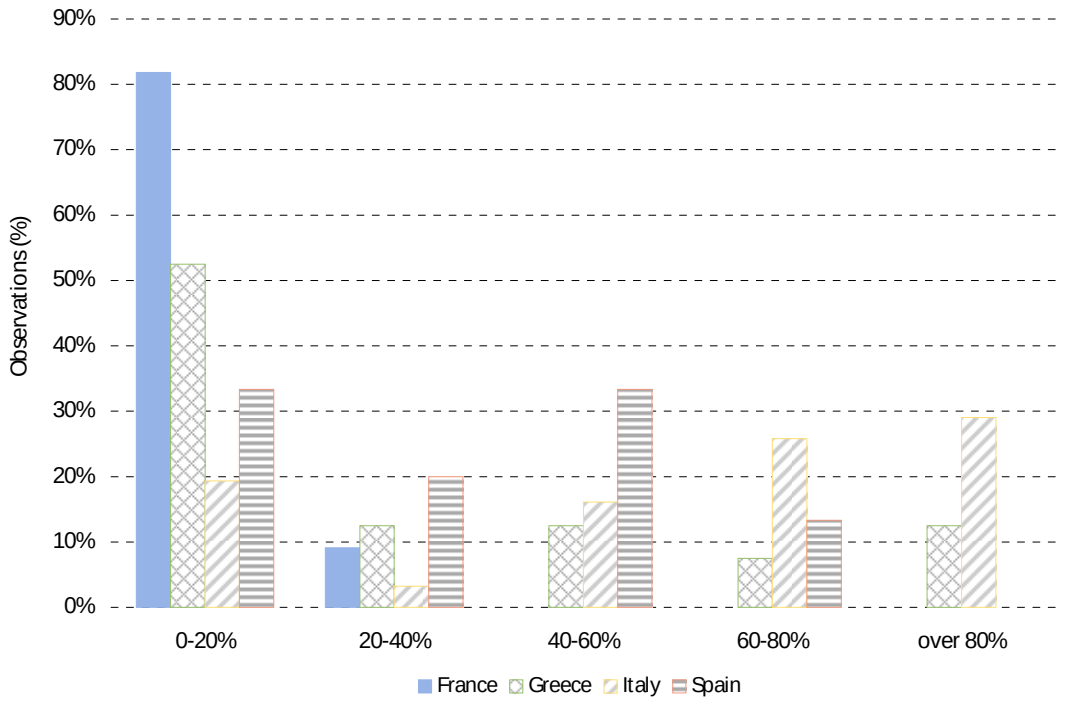
	Hours per hectare		Area		Total Labour Requirements (days)	
	Pre-reform	Post-reform	Pre-reform	Post-reform	Pre-reform	Post-reform
Total						
Italy	77	74	1,677	1,396	18,263	15,201
Spain	42	35	906	613	5,318	3,600
France	32	24	258	268	1,138	1,182
Greece	125	83	696	626	11,798	10,607
Total			3,538	2,903	36,518	30,589
Unpaid						
Italy	65	58	1,677	1,396	15,187	12,640
Spain	37	30	906	613	4,627	3,132
France	25	21	258	268	887	921
Greece	111	71	696	626	10,417	9,365
Total			3,538	2,903	31,118	26,058
Paid						
Italy	12	17	1,677	1,396	3,076	2,561
Spain	5	5	906	613	691	468
France	7	3	258	268	252	261
Greece	14	12	696	626	1,381	1,242
Total			3,538	2,903	5,400	4,531

Note: In calculating total labour requirements, an average of pre and post reform hours per hectare was used, to compensate for changes caused by the changing FADN sample.
Source: FADN, Eurostat, LMC

A further impression of the extent of total labour use for durum wheat can be gained from the questionnaire responses, when asked whether labour use per hectare had changed between 2006 and 2008, and 2007 and 2008, the consensus was that no change had occurred.

Analysis of the questionnaires also revealed that, on average in 2008, durum wheat production was found to account for 11% of household employment time in France, 32% in Greece, 55% in Italy and 35% in Spain. Diagram 7.2 shows the distribution of the results.

Diagram 7.2: Percentage of household employment derived from durum wheat production



Source: Questionnaire responses

The data underpinning Diagram 7.2 are shown in Table 7.5 alongside data for 2003. Inspection of the table reveals that, with the only exception of France, where the high frequency of no responses in 2008 means that data for 2003 and 2008 are not strictly comparable, the percentage of family farm employment dedicated to durum wheat production did not change significantly after the implementation of the 2003 measures.

Analysis of area data for this sample of farmers revealed that durum wheat area remained virtually unchanged after the reform. This provides additional support to the conclusions that while farm labour requirements per hectare did not change after the reform, the fall in area witnessed across the EU negatively affected employment in the durum wheat sector when this is expressed in days of total labour requirement.

Table 7.5: Percentage of household employment derived from durum wheat production in 2003 and 2008.

	2003	2008
France		
0-20%	36%	82%
20-40%	18%	9%
40-60%	0%	0%
60-80%	0%	0%
over 80%	0%	0%
No response	45%	9%
Greece		
0-20%	55%	53%
20-40%	13%	13%
40-60%	13%	13%
60-80%	3%	8%
over 80%	13%	13%
No response	5%	3%
Italy		
0-20%	19%	19%
20-40%	0%	3%
40-60%	13%	16%
60-80%	26%	26%
over 80%	35%	29%
No response	6%	6%
Spain		
0-20%	27%	33%
20-40%	27%	20%
40-60%	27%	33%
60-80%	13%	13%
over 80%	0%	0%
No response	7%	0%

Source: Questionnaire responses

7.3 Change in farm employment

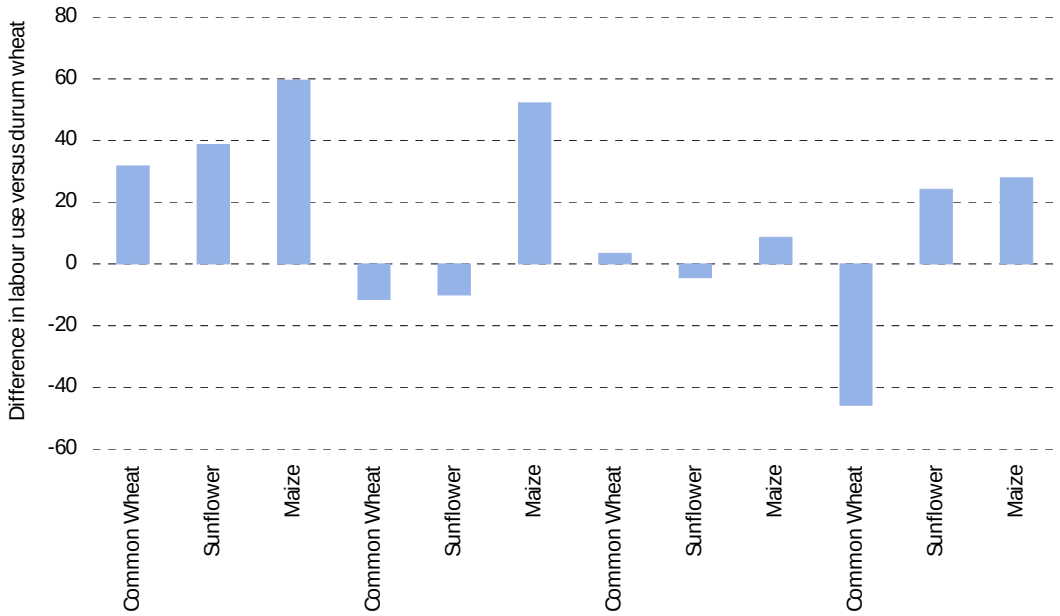
As discussed above, following the reform, farm employment from durum wheat has fallen due to a smaller number of farms growing durum wheat, a larger farm size and a lower crop area. The net effect on employment though is dependent upon what crops farmers switched to. If farmers switched to crops requiring more labour, the effect on employment would be positive.

Using the FADN data, Diagram 7.3 compares labour use (both paid and unpaid) for durum wheat with that of the major competing crops. Across all countries, maize is the most labour intensive crop.

For the other crops, labour requirements vary by country. In Italy and France, common wheat uses more labour per hectare than durum wheat, while in Spain and Greece the opposite is true. Labour use for sunflower is higher than durum wheat in Italy and Greece but lower in France and Spain.

When we take account of the additional area under alternative crops and the labour required for these crops, the level of employment loss decreases, from 16.2% to 15.3%. That employment does not increase more is due to the large areas in Greece and Italy that went into fallow following the reform.

Diagram 7.3: Per hectare labour use versus durum wheat (hours per hectare)



Source: FADN

7.4 Economic viability

Changes in economic viability are measured in two ways: in terms of gross margins and a return to unpaid labour. In the former case, in the extreme, when the gross margin falls below zero, production would be expected to cease and the crop is no longer viable.

When the gross margin of durum wheat is reduced relative to that of alternative crops, production would be expected to switch to the crop that is more viable with a higher gross margin.

Similarly with the return to unpaid labour, when the return falls below zero production would cease, while a change in the ranking of crops would led to a switch in production between the crops. Gross margins and the return to unpaid labour were discussed in detail in Chapter 4.

Changes to coupled payments and the move to the Single Farm Payment have lowered the gross margins (for both durum wheat and competing crops) and the return to unpaid labour. However, the increase in decoupled payments has reduced farmers' risk. Farmers' incomes are now no longer fully dependent upon the returns to a particular crop or a combination of crops. By reducing risk it can be argued that economic viability for the rural areas has been enhanced.

In addition, decoupling should facilitate the least competitive farmers to leave the sector, while the most competitive farmers should be able to enlarge their operations.

The fall in gross margins has in some cases weakened the attractiveness of durum wheat relative to competing crops, the most noticeable example being the change in ranking between durum wheat and common wheat in Spain following the reform. Table 7.6 summaries the analysis.

- In Italy, following the reform, the average gross margin fell from €434 per hectare to €75 per hectare, while the return to unpaid labour fell from €6.7 per hour to €1.2 per hour. With a rise in international prices in 2008, both the gross margin and the return to unpaid labour rose. The response of farmers to the fall in the gross margin was to reduce the area under durum wheat. With few alternative crops, the UAA fell.

Table 7.6: Gross margins, returns to unpaid labour and area changes

	Pre-reform	Post-reform	
		2006	2008
Italy			
Gross Margin (€/ha)	434	75	440
Return to unpaid labour €/hr)	6.7	1.2	7.1
Decoupled payment (€/ha)		327	317
Area ('000 ha)	1,677	1,396	1,472
Spain			
Gross Margin (€/ha)	591	328	510
Return to unpaid labour €/hr)	16.3	10.8	16.8
Decoupled payment (€/ha)		274	274
Area ('000 ha)	523	364	321
France			
Gross Margin (€/ha)	453	85	450
Return to unpaid labour €/hr)	19.7	4.0	21.3
Decoupled payment (€/ha)		318	318
Area ('000 ha)	258	268	271
Greece			
Gross Margin (€/ha)	368	46	458
Return to unpaid labour €/hr)	3.4	0.7	6.5
Decoupled payment (€/ha)		436	436
Area ('000 ha)	696	626	575

Source: Eurostat, FADN, Case Studies

- In Spain, following the reform, the average gross margin fell from €591 per hectare to €328 per hectare, while the return to unpaid labour fell from €16.3 per hour to €10.8 per hour. With a rise in international prices in 2008, both the gross margin and the return to unpaid labour rose. The response of farmers to the fall in the gross margin was to reduce the area under durum wheat and switch to common wheat where the gross margin was higher.

- In France, following the reform, the average gross margin fell to €85 per hectare, while the return to unpaid labour fell to €4.0 per hour. With a rise in international prices in 2008, both the gross margin and the return to unpaid labour rose. The change in gross margins did not alter the relative profitability of durum wheat versus competing crops and hence the area under durum wheat was unchanged. Viability was not affected. In addition, in 2008, with the rise in prices, the premium for durum wheat over common wheat rose improving the gross margin of durum wheat over common wheat and hence the area under durum wheat rose in the non-traditional areas.

- In Greece, following the reform, the average gross margin fell from €368 per hectare to €46 per hectare, while the return to unpaid labour fell from €3.4 per hour to €0.7 per hour. With a rise in international prices in 2008, both the gross margin and the return to unpaid labour rose. The response of farmers to the fall in the gross margin was to reduce the area under durum wheat; in part the UAA fell, while in other areas the common wheat area rose.

As the reform only occurred two or three years ago, depending upon the MS, it is still too early to determine whether the reform has facilitated structural change by facilitating the least competitive farms to leave the industry and by encouraging the most competitive to enlarge their operations. There is weak evidence that farm sizes are increasing, however as discussed in Chapter 4, this appears to be the continuation of a trend that began ahead of the reform, rather than a trend started by the reform.

7.5 Processing industry

7.5.1 Milling industry

As discussed in Chapter 5, over time, industry consolidation has meant that the number of durum wheat mills has declined. Employment data is only available for 2000 from the Semouliers' Association, and not all countries are covered. Average employment per plant was 11 persons per plant, with the highest employment rates in France. Using this average numbers for the full industry, and assuming that employment patterns have not changed, the number of people employed in the durum wheat mills has fallen from an average of 2,480 prior to the reform to 2,446 following the reform. This has occurred as the industry has consolidated, rather than an affect of the change in regime.

7.5.2 Pasta industry

As discussed in Chapter 5, the number of pasta factories in the EU has fallen over the period of the evaluation, with the majority of the reduction occurring prior to the change in regime (Table 7.7). This has occurred as the industry consolidated. Over the same period, direct employment has fallen. A full data series are not available for all countries having pasta factories (annual data are not available for UK, Portugal, Austria and Benelux), however, for the countries with a full data set employment has fallen from 12,340 in 2000 to 10,840 in 2008. The majority of this fall occurred prior to the change in regime. Since the introduction of the reform, direct employment has fallen by 11%. The average number of workers per factory is unchanged at 64.

Table 7.7: EU dry pasta facilities, employment and employment per plant

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post-reform
Plants	221	194	197	197	198	186	183	179	180	195	180
Employment											
Italy	7,200	6,904	6,904	7,020	6,780	6,481	6,480	6,429	6,429	6,901	6,446
Germany	2,300	2,102	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Spain	650	650	570	577	620	680	565	600	600	612	600
France	1,500	1,500	1,500	1,450	1,375	1,215	1,196	1,230	1,230	1,385	1,230
UK	150	na	na	na	na	na	na	na	na	na	na
Greece	650	650	700	700	700	750	700	550	550	713	550
Austria	103	na	270	360	na	na	na	na	na	315	na
Benelux	na	na	na	na	na	na	na	na	na	na	na
Portugal	240	300	180	178	na	na	na	na	na	179	na
Sweden	40	40	40	40	40	35	35	35	35	39	35
Total	12,833	12,146	12,164	12,325	11,515	11,161	10,976	10,844	10,844	12,143	10,861
Employment per plant											
Italy	46	52	52	52	51	50	50	50	50	51	50
Germany	100	105	100	100	100	100	100	100	100	101	100
Spain	54	54	48	52	62	85	71	75	75	59	75
France	167	167	167	207	153	152	150	154	154	169	154
UK	75									75	na
Greece	93	93	100	100	100	125	140	138	138	102	138
Austria	17		68	72						52	na
Benelux										na	na
Portugal	80	100	90	178						112	na
Sweden	40	40	40	40	40	35	35	35	35	39	35
Total	58	63	62	63	58	60	60	61	60	65	64

Note: Total employment per plant pre and post reform only covers countries that have a full data set.
Source: UNAFPA

7.6 Conclusions

EQ5.1. To what extent have the CAP measures supporting durum wheat promoted rural development in traditional areas with respect to employment and economic viability?

In the EU 27, the importance of durum wheat output to total agricultural output declined following the reform to around 0.7% from 1.1% pre-reform. This change is even more significant in the traditional production zones, where the value of durum wheat as share of total agricultural output fell from 4.5% to 3.7%.

The number of holdings growing durum wheat declined in most countries after the implementation of the 2003 reform. Among the EU-15, France was the only producer where the number of holdings growing durum wheat increased after the reform. The largest fall was in Italy, where durum wheat farms declined by 91,000 units between 2003 and 2007. Portugal also saw a sizeable decline, with the number of durum wheat holdings changing by 7,000 over the same period. After accession, the number of durum wheat farms declined across all EU-12 surveyed. The largest fall was in Romania, where around 4,000 farms left the sector.

While the number of holdings fell, there is weak evidence that the size of holdings has increased. Larger holdings are found to have lower per hectare labour requirements. However a two to three year period is a short time scale over which to draw firm conclusions.

In all case study MS, unpaid labour accounts for a sizeable share of total labour use, at over 75%. No significant change in unpaid labour use per farm can be inferred from the results of our analysis. In terms of the importance of durum wheat to total labour time, there is no clear indication as to whether this has changed after the reform, with analysis of cohorts of FADN farms for Greece and Italy provides conflicting evidence. Results of the farmer survey indicate that household labour requirements per hectare were not affected by the changes brought about by the 2003 reform. At the same time, the fall in durum wheat area post reform means that labour requirements (expressed in total number of days) fell. Based on the analysis of FADN data for Greece, France, Italy and Spain, it is estimated that the total labour requirements aggregated across these MS fell from around 36,500 days pre-reform to just below 30,600 days post-reform. Unpaid labour requirements changed from just over 31,100 days to around 26,000 days, while paid labour requirements declined from 5,400 days pre-reform to around 4,500 days post-reform. These results lead us to conclude that, to the extent that the 2003 measured had a negative impact on the area planted to durum wheat, they did not promote employment in rural areas.

Changes to coupled payments and the introduction of the Single Farm Payment have lowered the gross margins (for both durum wheat and competing crops) and the return to unpaid labour. These changes have had a different outcome in different MS:

- In Italy, farmers reduced the area under durum wheat and in the absence of remunerative alternative crops the total farmed area fell.
- In Spain, farmers abandoned durum wheat farming in favour of common wheat.
- In France, the change in gross margins did not change the relative crop rankings, with the result that viability was not affected. Area under durum wheat was unchanged.
- In Greece, durum wheat margins deteriorated relative to other crops. Part of the area was not viable and non-farmed, while in other cases, farmers switched to common wheat.

The results of our analysis suggest that the 2003 reforms did not promote the economic viability of durum wheat, when this is assessed in terms of gross margin advantage and return to unpaid labour. However, the increase in decoupled payments has reduced farmers' risk. Farmers' incomes are now no longer fully dependent upon the returns to a particular crop or a combination of crops. By reducing risk it can be argued that economic viability for the rural areas has been enhanced.

As the reform only occurred two or three years ago, depending upon the MS, it is still too early to determine whether the reform has facilitated structural change by facilitating the least competitive farms to leave the industry and by encouraging the most competitive to enlarge their operations. There is weak evidence that farm sizes are increasing, however this appears to be the continuation of a trend that began ahead of the reform, rather than a trend started by the reform.

Within the processing sector, the milling industry has undergone a significant programme of consolidation as discussed in Chapter 5. This has resulted in a decline in the number of people employed. This change, however, is attributable to consolidation of the industry rather than to the CAP measures. The pasta industry has also witnessed a decline in the number of operations, with smaller factories closing and employment falling. Like the milling industry, this change is not a consequence of the 2003 reforms.

Chapter 8: Efficiency, Management and Administration

Q6.1 To what extent have the CAP measures applicable to the durum wheat sector after the 2003 reform been efficient in achieving the objectives of these measures?

Q6.2 To what extent have the CAP measures supporting durum wheat contributed or counteracted to achieving a simplified and effective administration and management?

Efficiency is defined in terms of budgetary cost and a determination as to whether the management and administrative costs of the support system are lower post reform than was the case prior to the reforms. In this sense, this latter consideration is covered in the second question and hence we combine both questions, while developing specific judgment criteria to cover the simplified and effective administration and management (these are listed in table 8.1).

While the object of the overall reform was to improve competitiveness in the sector, the specific objective for durum wheat was identified in Recital no. 35 of Council Regulation 1782/2003 in the maintenance of *the role of durum wheat production in traditional production areas while strengthening the granting of the aid to durum wheat respecting certain minimum quality requirements.*

The efficiency of the CAP measures in achieving their objectives will therefore be assessed based on two objectives: the maintenance of production in traditional areas and the maintenance or improvement of the level of quality of EU durum wheat (this is based on the quality requirements of end-users).

Our analysis will also establish the extent of the deadweight associated with the 2003 reform. DG Budget defines deadweight effects as "*effects which would have arisen even if the intervention had not taken place. Deadweight effects can also occur when individuals and groups who are not in the target population end up as recipients of benefits produced by the intervention*".

In order to assess whether the measures have contributed to simplified and effective management, we first, examine with the costs of managing the system pre- and post-reform, and second, compare the administrative requirements of the individual measures pre- and post reform.

The answers to questions 6.1 and 6.2 are presented as one discussion in the section that follows.

Table 8.1: Question 6.1 and 6.2 judgement criteria, indicators and data sources

Judgement criteria	Indicator	Data Sources	
		Quantitative	Qualitative
Cost of the coupled durum wheat measures	Aggregate budgetary cost of the measures	DG Budget	
Maintaining production in traditional areas	Area changes traditional versus non-traditional areas	Eurostat/FADN/Case studies	
Quality improvement	Processors responses		Processors Interviews
	Proportionally greater use of EU production by processors	Eurostat	
	Increasing use of eligible varieties	DG Budget	
Deadweight, as defined in DG Budget, *Evaluating EU Activities* July 2004	Changes in output in MS that would have arisen in the absence of payments had not been made	Eurostat	
Unintended side effects	Changes in seed prices, certified versus non-certified		Farmer questionnaires
Complexity of the administration	Administrative workload required to implement the CAP measures	National government institutions	
	Cost of the procedures required to certify seed	National and regional government	

Evaluation question 6.1: Efficiency of the measures

8.1 The Efficiency of the reform

8.1.1 Cost of the measures

Four specific measures are applicable in determining the budgetary cost of durum wheat measures following the reform: the remaining coupled aids in Spain and France; aid under Article 69, as applies to Italy and Greece; the quality premium payable in the traditional areas; and the special payment to non-traditional areas that was abolished under the reform. The cost breakdown of these measures is presented in Table 8.2.

Table 8.2: Budgetary cost of durum wheat measures (million euros)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Special payment	2.0	9.3	8.4	8.4	9.4	6.1			
Durum wheat supplement	1,004.2	1,014.7	1,191.5	852.5	1,103.6	977.5	396.0	55.8	46.1
Quality Premium						125.9	102.5	82.3	79.2
Article 69							72.7	140.1	121.6
Total	1,006.2	1,024.0	1,199.9	860.8	1,113.0	1,109.5	571.2	278.2	246.9

Source: DG Budget

Following the reform, the cost of these coupled measures, which were introduced in different periods across MS, had fallen to €246.9 million in 2008; of this €79 million was targeted towards supporting quality improvement, while the remainder was to support production (€167 million). Prior to the reform, annual aid was targeted towards supporting production and was in the order of €1 billion per annum. An assessment of efficiency can then be made by examining trends in production (specifically in traditional areas) and quality and observing how these have responded to the change in budget allocations.

8.1.2 Maintenance of production in traditional producing regions

An analysis of data on area and production of durum wheat was presented in Chapter 4 and is shown in Table 8.3 at an aggregate EU-27 level, distinguishing between traditional and non traditional production areas. The data reveals that, while area declined in traditional areas by 23% following the reform, the change in production was less severe due to higher yields. Production in traditional areas was on average 13% lower following the reform. However, because of the growth in production in non-traditional areas, total production was on average 6% lower.

Given the fall in production in traditional areas, the reforms have therefore not ensured the maintenance of production at the levels that existed prior to the reforms in traditional areas.

The reform can be considered efficient in the sense that support coupled specifically to aid production has fallen by close to 80% but the resulting fall in production was only 13%, and even less when non-traditional areas are taken into account.

Table 8.3: EU-27 durum wheat area and production

	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Pre-reform	Post-reform
Area ('000 hectares)											
Traditional	3,551	3,627	3,787	3,722	3,874	3,407	2,837	2,726	2,874	3,717	2,839
Non- trad	193	132	173	156	205	237	263	279	306	183	283
Production ('000 tonnes)											
Traditional	9,203	8,259	9,492	8,079	11,517	8,326	8,015	7,191	8,476	9,159	7,980
Non-trad	891	682	732	753	1,111	1,043	1,350	1,330	1,680	862	1,415

Source: Eurostat

8.1.3 Quality improvement

For the first time the 2003 reform specifically introduced a quality objective. As discussed in Chapter 4 and 5, there are a number of attributes to durum wheat quality, with the one that is considered most important by the end users being protein content.

The experimental station evidence from Italy is that protein content has declined since the introduction of the reform. In France, durum wheat quality is, on average, higher than the quality of Italian durum wheat. In addition, unlike Italy, no changes occurred in the protein content of durum wheat grown in French traditional regions after the reform. The majority of processors reported that there had been no change in quality following the reform

This outcome leads us to the consideration that, in terms of maintaining or improving minimum levels of quality of durum wheat, the measures have had different impacts depending on the country. However, if this objective is evaluated in terms of overall EU production in traditional areas, we conclude that the quality premium has failed to achieve its stated objective. Based on this outcome, this measure has not been efficient.

There are a number of possible reasons for this:

- First, an important external factor, is weather conditions, particularly, the level of rainfall. This plays a crucial role in quality determination. Higher level of rainfall will have reduced quality although yields would be higher. There is evidence that average yields have been higher in Italy, pointing to higher rainfall levels.

- Second, quality premium is implemented differently in individual MS, in that different certifying agencies are in each country, the number of qualifying varieties and the quantity of certified seed required is different.

Table 8.4 summarises the number of durum wheat varieties eligible to receive the quality premium in the three case study MS where this information was available. These range from 119 in Italy to 272 in Greece.

Table 8.4: Number of durum wheat varieties receiving the quality premium

Greece	272
Italy	119
Spain	148

Note: In Greece, the list was established by two Ministerial Decisions published in 2003 and 2005.
In Italy, the list is published annually by the Ministry of Agriculture. There is a separate list for the varieties receiving a premium under Art.69 of Reg. 1782/2003.
In Spain, a Real Decree established a provisional list of varieties eligible to receive the quality premium for the 2004/05 and 2005/06 campaign (2004 and 2005 harvests). In 2006/07, the list, contained in a Real Decree, was fixed for a period of five years, although it can be revised every two years.

The eligible varieties have different characteristics not all of which lead to higher quality. For instance, for the Italian case study region of Puglia, in 2006, yields ranged between 3 and 5 tonnes per hectare, while protein content ranged from 12.5% to 14% for eligible varieties. Our analysis on the changes in the most common varieties in Puglia also highlighted how farmers have switched to higher yielding varieties. One reason behind this is that use of these varieties maximise the farmers' returns when calculated on a per hectare basis. Whether a higher quality variety is grown will then depend upon the premiums offered by the processors.

The large number of varieties benefiting from the protein premium makes it more difficult to achieve a consistent level of quality as the distribution of varieties actually grown is likely to be

quite dispersed (as is the case in Italy). By means of comparison, in Canada, varieties are classified into two groupings depending upon location, Canada Eastern Amber Durum (CEAD) and Canada Western Amber Durum (CWAD). For CEAD, there are 11 eligible varieties and for CWAD there are 15 approved varieties. In France, which has the highest quality production, the industry recommends varieties that should be used. The industry recommends five varieties, while a further six are noted as having good characteristics.

In terms of the use of eligible seed, in Greece, the requirement is that 80 kg of eligible seed is used per hectare (compared with total use of 250 kg), in Italy, 180 kg per hectare of eligible seed is required, while in France all seed used in the traditional areas must be eligible, the same is true of Spain where the requirement is 250 kg of certified seed per hectare. That non-eligible seed can be used in traditional areas, and the premium still received further undermines the quality objective.

8.1.4 Deadweight effects

Having established that the quality premium was not efficient in maintaining or improving the quality of EU durum wheat production, we can conclude that it represents a deadweight loss, in that the changes in quality would have occurred irrespective of the measure.

Where the quality premium measure may have had an effect though is in maintaining production. Thus producers would have considered the quality premium alongside other coupled payments as part of their revenue in determining whether to continue to grow durum wheat.

Our preceding analysis established that the level of production in traditional regions fell by 13% following the introduction of the reform. Using the elasticities created in Chapter 4, we can assess what the effect of reducing the coupled aid by the quality premium would have been on gross margins, and consequently, the area under durum wheat. The results of this analysis suggest that at 2008 prices, the area under durum wheat would have been in the order of 1.6% lower than what was actual the case, at 2006 prices, the fall in area would have been larger (9.4%) as the importance of the coupled payment to the gross margin is higher.

So while it can be argued that the quality premium has not improved quality, it has aided production by improving the gross margin. In its absence, we can assert that the fall in production in traditional areas would have been greater than what actually occurred.

8.1.5 Unintended side effects

The introduction of the quality premium has influenced the varieties that farmers grow. Here we compare how the price of certified seed has altered compared to non-certified seed. In terms of prices of certified seeds, these are between €85 and €190 per tonne (€21 to 48 per hectare) higher than prices of non certified seeds. In Greece, prices of certified seeds are around €100 per tonne (€25 per hectare) higher that prices of seeds not receiving the quality premium, while in Spain this difference is around €150-210 per tonne (€37.5-52.5 per hectare). In France, the case does not arise as all seed sold is eligible seed.

This suggests that a proportion of the premium is captured by the seed companies, and in the case of Spain the whole premium. The justification for this is that it encourages the development of improved seed varieties. The industry suggest that an important part of the quality premium is to cover the higher cost of certified seed, thus the objective of the quality premium can be seen as both promoting quality and ensuring the provision of research.

The benefits to farmers using eligible seed then depends upon whether revenues are higher, or costs lower, from using eligible seed compared to not using eligible seed.

Whether it is worthwhile for farmers to use certified seed can be seen in the area covered by the quality premium. As shown in Diagram 4.37 above, in France and Spain the whole of the traditional area is planted with eligible seed. In Italy 80% of the traditional area received the quality premium, while in Greece the proportion is lower at 75%. This suggests that despite the higher cost of certified seed, the majority of farmers perceive that there are benefits to using this seed.

Evaluation question 6.2: Simplification & effective administration of the CAP

8.2 Complexity of the administration of the measures

This discussion covers two issues. First, we analyse the administrative workload required by official agencies and producers to implement the CAP measures. Second, we investigate the cost of the procedure required to certify seeds which benefit from the quality premium.

8.2.1 The administrative workload required to implement the CAP measures

Administrative workload for national paying agencies

There is very limited information available on this aspect. The payments to farmers and the controls required before granting aid to beneficiaries are carried out at a national level by paying agencies accredited by the MS. The only MS for which information on the administrative cost of the measures is available is France[30]. In France a model of partial decoupling was adopted.

However, this analysis does not provide a breakdown of the costs specifically associated with administering the durum wheat measures. This is because, when operating the payments and the controls required by the CAP measures, national authorities do not distinguish between individual crops or livestock operations. As a result, the assessment presented below refers to the administration of the CAP measures for all crops and livestock.

The key indicator used in the report to establish the administrative costs of the measures is called "*Coût de gestion des aides du 1er pilier"*. This is listed under Objective 4 ""*Mettre en oeuvre les politiques communautaires (premier pilier) dans des conditions optimales de coût et de qualité de service*". The evolution of the indicator over time is presented in Table 8.5.

The indicator covers the cost of all resources used for the implementation of the First Pillar of the CAP. These include the Ministry of Agriculture and Fisheries, the Single Paying Agency (AUP) and Boards such as ONIGC. It is measured as a percentage of the total aid received from the Commission from measures of the first pillar and it is expressed from the taxpayer's point of view.

The administration costs include salaries, travel expenses, equipment borne by the Ministry and paying agencies. They do not include the costs incurred by other departments or governmental offices involved in the negotiation of measures and the controls of the correct application of the measures (such as custom offices).

Table 8.5 reveals that, over time, administration costs have remained quite stable at around 2.8%. No significant change can be detected in 2007 and 2008 relative to the years prior to the reform.

[30] See The Performance of Programme 227: "Valorisation des produits, orientation et régulation des marches" published in 2008 by the Ministry of Agriculture and Fisheries

Similar data are not available for the other major producing countries.

Table 8.5: Cost of administering the first pillar CAP measures as a percentage of the CAP aid received

2005 Actual	2006 Actual	2007 Actual	2008 Initial Forecast	2008 Revised forecast	2008 Actual	2009 Target
2.68	2.81	2.79	2.89	2.84	2.7	less than 2.84

Source: Ministry of Agriculture and Fisheries, Single Paying Agency (AUP)

Administrative workload for durum wheat producers

This section assesses whether administration has been simplified for durum wheat producers by comparing measures before and after the reform. In this case, prior to the reform producers were required to notify the authorities of the area under durum wheat, this was verified and then payments made, the amount depending upon whether the area was a traditional or non-traditional area. Following the reform a number of points can be made:

- Producers are still required to document the area under durum wheat, there is no change pre- and post reform. In the latter case, this is now carried out as part of the documentation required for the Single Farm Payment. There are no indications that the amount of information required for the Single Farm Payment is different for countries still retaining partially coupled aids to COP crops than for countries where payments to these crops are fully decoupled.

- With the quality premium details of both the variety and quantity of eligible seed per hectare are required. The same applies to details of the varieties that receive the premium under Article 69, for the MS applying this measure. This has increased the administrative burden.

As our analysis suggests, the reform has not added to the overall administrative cost of the CAP measures from the point of view of national paying agencies. This conclusion is based on the experience of France where a partial decoupled model was adopted, it is unclear whether this would be the case in the other producing countries, particularly in those were full decoupling and Article 69 payments was adopted.

However, within the durum wheat sector, the administration for farmers has not been simplified. Records on areas have been maintained for traditional and non-traditional areas. In addition, the introduction of the quality premium and payments under Article 69, for the MS that have chosen this option, mean that the administrative burden has increased as farmers need to report details of the varieties used.

8.2.2 Cost of the procedures required to certify seed

That only eligible varieties receive the quality premium means that an additional cost is borne in approving varieties. The issue is further complicated in Italy, in that two seed lists are maintained one for producers receiving aid under Article 69 and one for producers receiving the quality premium.

The list of varieties eligible to receive the quality premium is defined at MS level. The discussion of EQ 6.1 revealed that the number of certified varieties is quite large ranging from 119 in Italy to 272 in Greece.

Of all seed varieties listed in the National Catalogues, only seed that has undergone the specific certification procedure required to receive the quality premium can be included in the list of certified varieties. On average, certification takes place over two years. In Italy, the cost of the procedure is borne exclusively by seed producers. This is estimated at around €1,460 per year per variety. In Greece, the vast majority of the certification cost is paid by the government. Seed producers pay €1,200 for the application for a variety. The only other cost incurred by the seed company is the internal inspection, while all costs of trials are paid by the state. In France, there is no additional cost for certifying varieties.

8.3 Conclusions

Q6.1 To what extent have the CAP measures applicable to the durum wheat sector after the 2003 reform been efficient in achieving the objectives of these measures?

Q6.2 To what extent have the CAP measures supporting durum wheat contributed or counteracted to achieving a simplified and effective administration and management?

The reform can be considered relatively efficient in terms of maintaining production as coupled costs (focussed at both production and quality) have fallen by close to 70%, while durum wheat production declined by 5%, although this is partly due to higher non-traditional area production. In traditional areas, area contracted by 23% following the reform, while production was 13% lower.

In terms of quality improvement the reforms have not been efficient across the EU as the level of quality (expressed as protein content) has not improved. This conclusion though is only reached on two to three years worth of data. The effect of longer term factors that lead to an improvement in quality, such as the development of improved seed, would not be apparent over this time period. In Italy, average quality has remained unchanged since 2004. In France, no significant changes in the level of quality were discernible post reform. This outcome is partly due to the way in that the reform has been implemented, in terms of the number of eligible varieties receiving the premium and the quantity of eligible seed required to be planted to receive the premium.

In terms of administrative complexity, the experience of France, where a partially decoupled model was adopted suggests that administrative requirements have remained fairly unchanged for national paying agencies. It is not proven whether this is the case for the other durum wheat producing countries.

However, farmers in areas eligible to receive the quality premium and payments under Article 69 are now required to provide details on varieties used and amount of seed per hectare, which has added to the administrative burden. In addition, the procedures required to certify seed varieties eligible to receive the quality premium and aid under Article 69 have added to the administrative requirements post-reform.

Chapter 9: Relevance and Coherence

Q.7.1.To what extent have the CAP measures supporting durum wheat influenced the environment?

Q.7.2. To what extent are the CAP measures supporting durum wheat after the 2003 reform coherent with the principles of the reform of the CAP (first and second pillar) and with overall EU objectives?

Evaluation question 7.1: Effects on the environment

9.1 Effect on the environment

Farming practices have a strong influence on the environment. A set of indicators are set out in the Indicator Reporting on the Integration of Environmental Concerns into Agriculture Policy (IRENA) documentation. The indicators that are most relevant to this evaluation are grouped together under "driving forces". These concern input use, land use and trends in farming activities, i.e., the level of intensification and specialisation focus.

Where land use has changed, the environmental impact is determined on an opportunity cost basis, i.e., what is the opportunity cost of switching production from durum wheat to maize, for instance? Table 9.1 presents the judgement criteria, indicators and data sources used in the discussion of this question.

Table 9.1: Question 7.1 judgement criteria, indicators and data sources

Judgement Criteria	Indicator	Quantitative data sources	Qualitative data sources
Intensity of production	Trends in input use, durum wheat vs.competing crops	FADN/Eurostat	Farmers' questionnaires/Interviews with farmers' associations
	Trends in yields, durum wheat vs. competing crops	Eurostat	
	Level of specialisation, durum wheat vs. alternatives	Eurostat	Case study, Farm Questionnaires
Changes in area over time by MS vs. area changes for other arable crops	Durum wheat area vs. alternative crop area	Eurostat/Case studies	Farmers' questionnaires/ Interviews with farmers' associations

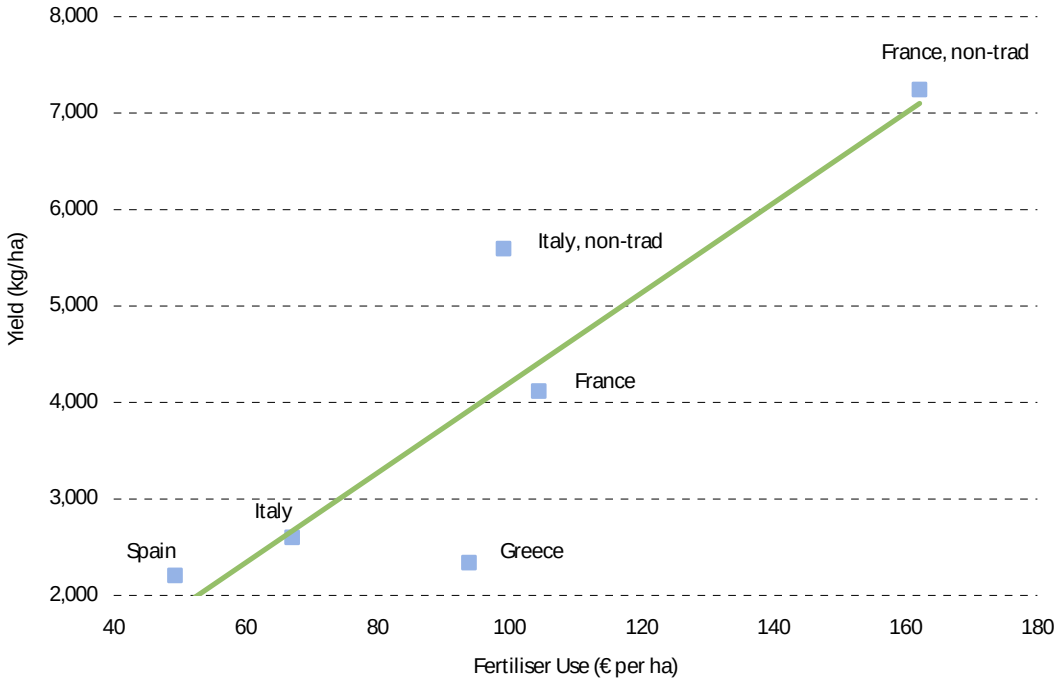
9.2 Intensity of production

9.2.1 Trends in input use: durum wheat versus alternative crops

In traditional areas, most durum wheat production is non-irrigated, as water requirements are generally low. Likewise fertiliser and pesticide requirements are relatively low. In the latter case, this is mainly due to the high density of sowing. In France and the non-traditional areas of Italy, input requirements are greater, which results in higher yields.

Using FADN and case study data, Diagram 9.1 highlights the relationship between yields and input use for the case study countries, distinguishing between traditional and non-traditional areas in France and Italy.

Diagram 9.1: Relationship between fertiliser expenditure and yields, average 2000 - 2006



Source: FADN

An indication of trends in input use between competing crops can be gained by using the FADN data. The FADN data separately specify the costs of fertiliser, crop protection and water/irrigation. Comparing costs within regions and assuming that the unit cost of inputs is similar across crops means that differences in costs can be taken as difference in the intensity of input use.

Using the same FADN data set as was used to calculate the gross margins in Chapter 4, Table 9.2 compares the costs of fertiliser, crop protection and water/irrigation on a per hectare basis for durum wheat and the alternative crop specialists. The data confirm the low level of expenditure on inputs for durum wheat, particularly the low cost of water/irrigation.

The table reveals that across countries, input costs for maize are the highest, a reflection in part that much of the area is irrigated. Evidence collected during the fieldwork reveals that in the Greek region of Thessaly, for instance, fertiliser requirements for maize are 1,600 kg per hectare compared to between 450 to 500 kg for durum wheat, while water requirements are 7,500 cubic meters per hectare for maize compared to 100-150 cubic meters per hectare for durum wheat (this can be as low as 60 cubic meters per hectare as indicated by Greek farmers interviewed in Central Macedonia).

Sunflower has the lowest input requirements. The requirements for durum wheat and common wheat are similar, except in Spain where fertiliser requirements are less for common wheat.

Table 9.2: Unit costs of inputs, 2000 -2006 (€ per ha)

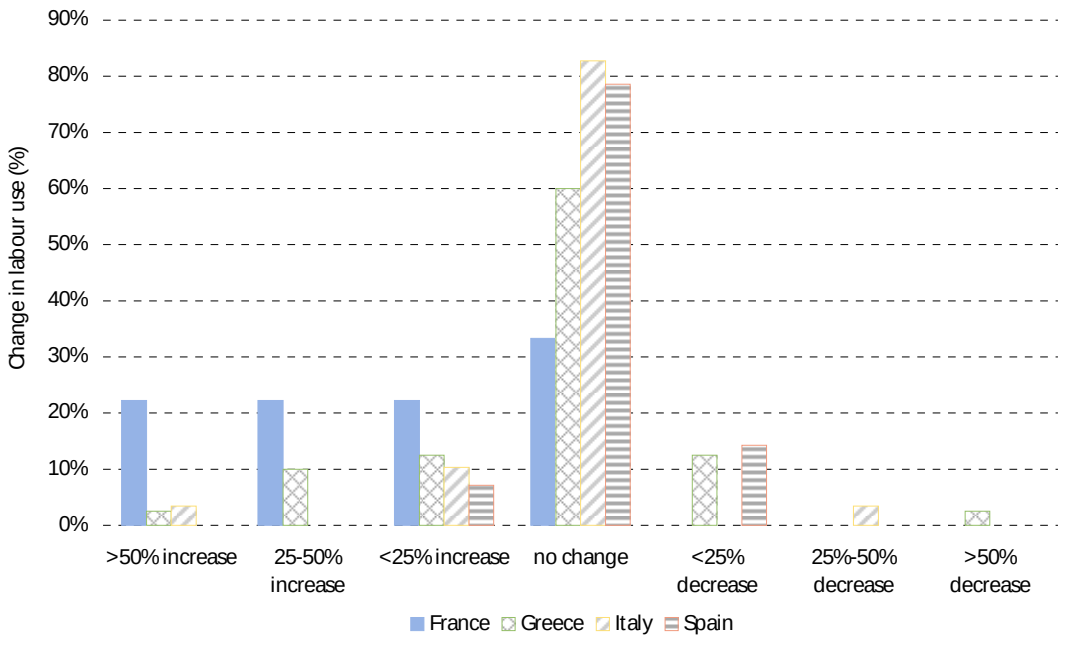
	Fertiliser			Crop protection			Water/irrigation		
	Pre-reform	Post reform	Average	Pre-reform	Post reform	Average	Pre-reform	Post reform	Average
Italy									
Durum wheat	65	73	67	34	39	35	4	7	5
Common wheat	72	130	89	26	32	28	0	0	0
Sunflower	57	69	60	30	30	30	0	0	0
Maize	112	152	123	42	66	49	23	8	19
France									
Durum wheat	103	111	104	106	65	100	27	25	26
Common wheat	122	71	115	109	66	103	9	60	16
Sunflower	92	103	93	96	100	97	2	2	2
Maize	179	189	180	80	79	80	24	27	24
Greece									
Durum wheat	96	83	94	47	48	47	5	5	5
Common wheat	91	109	93	41	46	42	5	7	5
Sunflower									
Maize	211	196	209	114	115	114	66	63	65
Spain									
Durum wheat	49	33	49	17	33	18	7	2	7
Common wheat	35	34	35	8	13	8	1	3	1
Sunflower	30	33	31	18	26	19	5	2	4
Maize	186	255	196	81	88	82	112	196	124

Source: FADN

9.2.2 Changes in input use

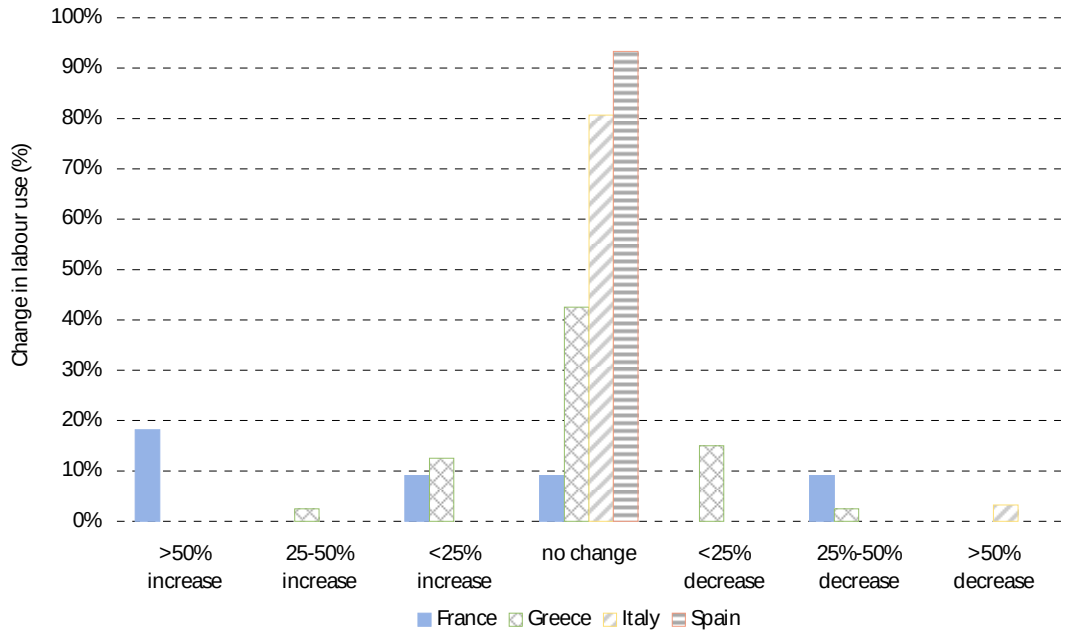
Evidence from the questionnaires reveals that the majority of farmers have not changed the intensity of input use for pre and post reform either for durum wheat or the main competing crops. Diagrams 9.2 and 9.3 show the responses to the question "How has the use of fertiliser changed for durum wheat (Diagram 9.2) and the most important alternative crop?" (Diagram 9.3). Similar analysis conducted for the other major inputs reveals that use of these inputs has not changed considerably either. The main environmental impact of the policy change comes from the changes in crop areas and what alternative crops were grown.

Diagram 9.2: How has your use of fertiliser per hectare of durum wheat changed?



Source: Farmer Questionnaire

Diagram 9.3: How has fertiliser use changed for the most important alternative crop?



Source: Farmer Questionnaire

9.2.3 Changes in yields

Comparing trends in yields before and after the reform (Table 9.3) shows that yields for durum wheat rose in Italy and Spain and fell elsewhere. As discussed on Chapter 5, the rise in yields in Italy was associated with a number of factors including: good weather conditions and a switch to higher yielding varieties rather than change in farm practises. In the case of Spain, pre-reform yields are artificially low due to the drought in 2005. When we remove this observation, the change in yields following the reform is 10% higher. The observed change in yields is consistent with the picture painted above, suggesting that, in most cases, input use has not changed following the introduction of the reform.

Table 9.3: Change in yields, pre and post reform (kg/ha)

	Pre-reform	Post reform	Change in Yield
Italy			
Durum wheat	2,484	2,885	16%
Common wheat	3,731	3,174	-15%
Sunflower	1,836	1,532	-17%
Maize	6,944	5,173	-25%
France			
Durum wheat	4,140	3,837	-7%
Common wheat	5,364	4,973	-7%
Sunflower	2,146	2,160	1%
Maize	7,866	8,729	11%
Greece			
Durum wheat	2,358	2,191	-7%
Common wheat	2,666	2,575	-3%
Maize	10,135	10,081	-1%
Cotton	3,274	2,839	-13%
Spain			
Durum wheat	2,128	2,582	21%
Common wheat	3,173	3,054	-4%
Sunflower	981	1,110	13%
Maize	9,899	10,173	3%

Note: Pre reform 2000 – 2004 Italy, 2000 – 2005 elsewhere, post reform 2005-2008 Italy, 2006-2008 elsewhere
Source: Eurostat

9.2.4 Level of specialisation

The issue of specialisation is dealt with in more detail in Chapter 5. As presented in the Chapter, examining trends over time from the FADN data provides reveal that the proportion of the area under durum wheat fell in Greece and Italy, but increased marginally in Spain and France following the reform. The results of this analysis are shown in Table 9.4. The reduction in specialisation revealed by the analysis and a reduction of the level of mono-cropping have environmental advantages. It is important to point out, due to the nature of the FADN data, which is based on a sample of farms, these data underestimate the extent of change in area. As such, they only provide weak evidence of a reduction in specialisation.

Table 9.4: FADN: Area under durum wheat (%)

Country	Area	2000	2001	2002	2003	2004	2005	2006	Post Reform change on previous 3 years
France	Centre	11.1%	11.0%	12.3%	16.1%	15.3%	14.6%	15.2%	-0.7%
	South	28.9%	28.3%	29.6%	30.9%	33.0%	33.8%	33.2%	2.0%
Italy	North	19.7%	27.0%	18.0%	16.7%	12.9%	14.3%	11.5%	-21.7%
	Centre	38.3%	36.8%	39.3%	36.2%	38.4%	31.7%	30.8%	-13.2%
	South	42.5%	43.7%	46.7%	44.4%	44.6%	40.3%	36.7%	-14.9%
Greece		48.4%	50.9%	51.2%	52.5%	52.4%	53.3%	45.4%	-13.9%
Spain	Centre	31.1%	30.1%	28.8%	30.6%	31.7%	28.5%	31.5%	3.9%
	South	29.0%	28.2%	31.7%	32.7%	31.6%	32.5%	33.5%	3.8%

Source: FADN

9.3 Change in crop areas

As discussed in Chapter 4, following the reform, the area under durum wheat fell across the EU 27. The main beneficiaries of this change among the COP crops were an increase in plantings of common wheat in Spain and Greece. The set aside area also increased, while the total utilised agricultural area (UAA) fell in Greece and Italy.

A change to common wheat is broadly neutral in environmental terms as input requirements are similar for durum and common wheat, although less fertiliser appears to be required in Spain for common wheat. A fall in the UAA can either mean that land has been abandoned or it is maintained in good agricultural condition in order to ensure cross-compliance and the payment of the single farm payment. In the latter case, this is assumed to have environmental advantages.

Comparing the planted areas for the largest five producers (as shown in Table 9.5) reveals that since the reform the average area under durum wheat fell by 20% following the reform from an annual average of 3.8 million hectares to 3.0 million hectares. This fall in area was partially compensated by rises in area for common wheat, rapeseed, barley and set-aside, while the total COP area also fell. Assuming that the set aside area corresponds to land being maintained in a good agricultural condition this accounts for 450,000 hectares of the change in area. That

the total COP area plus set aside falls suggests that a proportion of land is no longer farmed (around 570,000 hectares).

Table 9.5: Major EU producers area under competing crops ('000 hectares)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average Pre-reform	Post-reform
Durum Wheat	3,676	3,688	3,896	3,803	3,999	3,575	3,046	2,958	3,121	3,828	3,053
Common wheat	6,239	5,621	6,194	5,570	5,738	5,991	5,873	5,949		5,884	5,919
Maize	3,248	3,484	3,378	3,349	3,471	3,142	2,932	2,902		3,354	2,930
Sunflower	1,808	1,791	1,551	1,643	1,497	1,273	1,391	1,241		1,606	1,312
Rapeseed	1,023	923	859	898	938	1,028	1,166	1,402		947	1,283
Barley	5,299	5,162	5,213	5,298	5,240	5,220	5,349	5,412		5,237	5,367
Rye	204	186	183	184	171	163	174	167		183	171
Cotton	412	404	383	374	374	366	374	364		386	369
Set aside	3,160	3,563	3,368	3,446	3,422	2,979	3,740	3,902		3,326	3,776
Total	25,069	24,822	25,024	24,565	24,849	23,737	24,044	24,296		24,751	24,181

Note: Area only includes durum wheat growing areas (traditional and non-traditional), except for set aside which covers whole country area.
The comparison is based on the summation of individual country data, hence the pre and post reform averages take account the different starting points for the reform.
Source: Eurostat

9.4 Conclusions

Q.7.1.To what extent have the CAP measures supporting durum wheat influenced the environment?

Following the reform, there has been little change in input use of durum wheat or its main competing crops on a per hectare basis. This means that the effect of the reform on the environment is dependent upon cropping patterns following the reform. Across the EU-27, the area under durum wheat fell, in a minority of cases durum wheat was replaced by common wheat, but in most cases the area was left fallow and the total utilised agricultural area fell.

In terms of an environmental impact, a switch to common wheat is neutral as the level of input use is similar to durum wheat, while the effect of a fall in the UAA depends on whether the land is maintained in good agricultural condition or abandoned. The former is assumed to have environmental advantages. Our analysis suggests that following the reform the set aside area in the major durum wheat producing countries rose by 450,000 hectares, while the total COP area (including set aside) fell by 570,000 hectares. This suggests that a proportion of the land is no longer farmed.

Evaluation Question 7.2: Coherence of the measures

9.5 Coherence of the reforms

The coherence of the reforms to the overall concept and principles of the 2003 reform, can be assessed though examining the general objectives of the CAP reform cited as the final objectives in the logical diagram presented in Chapter 2. These are: the promotion of a market-orientated agriculture; increased competiveness; ensuring the supply of the crops to consumers at reasonable prices; the provision of a fair income for producers, strengthening rural development, and the sustainability of agriculture. A fair income we assume to be a stable income.

These issues have been considered to greater detail in earlier Themes, and in answering this question we draw on the earlier analysis. The judgement criteria used in the following discussion are summarised in Table 9.6.

Table 9.6: Question 7.2 judgement criteria, indicators and data sources

Judgement criteria	Indicator	Data Sources	
		Quantitative data sources	Qualitative
Promotion of market orientated agriculture and reasonable prices for consumers	Comparison of internal market prices with international prices	National and regional government and academic institutions	.
	Levels of import tariffs	Case study interviews	.
	Extent of export refunds for non-annex 1	.	.
	Foreign trade as a share of consumption	Eurostat, Producer questionnaires	.
	Coupled payments as a proportion of income	DG Agri	.
	Determinants of farmers' decision making	.	Farmer questionnaires
Improved competitiveness	Comparison of internal market prices with international prices	National and regional government and academic institutions	.
	Change in export volumes	Eurostat	.
Stable income for producers	Proportion of coupled payments in producer incomes, for durum wheat and alternative COP crops	FADN	.
	Comparison of gross margins per hectare (including decoupled payments) pre- and post-reform	FADN, farmer questionnaires	.
Sustainability of agriculture	Environmental impact of durum wheat crop production	FADN, farmer questionnaires	Farmer questionnaires
Employment generation	Labour use per hectare over time by MS, area under durum wheat	FADN, Eurostat	Farmers' questionnaires
	Labour use per hectare alternative crops over time by MS, area under durum wheat	FADN, Eurostat	Farmers' questionnaires
	Numbers employed per factory, by size, by MS	Industry Associations	Processing questionnaire
	Number of mills and pasta processors by year by MS	Industry Associations	Processing questionnaire
	Change in employment in downstream industries	Industry Associations	Processing questionnaire

9.6 Promotion of a market orientated agriculture

9.6.1 Comparison of prices

Comparing export unit values with import unit values gives an indication of the difference between international and internal prices in the EU. Export unit values reflect EU prices, while import unit values reflect international prices. As shown in Chapter 6 (Diagram 6.4), the two series track each other very closely. That this is the case points to reasonable pricing for consumers as EU prices reflect international prices.

9.6.2 Changes in border measures

Border measures were retained under the Mid Term Review and not changed. The import duty on durum wheat has been €0 per tonne since July 2000 and Most Favoured Nation (MFN) import duties on pasta products have been unchanged since 2000.

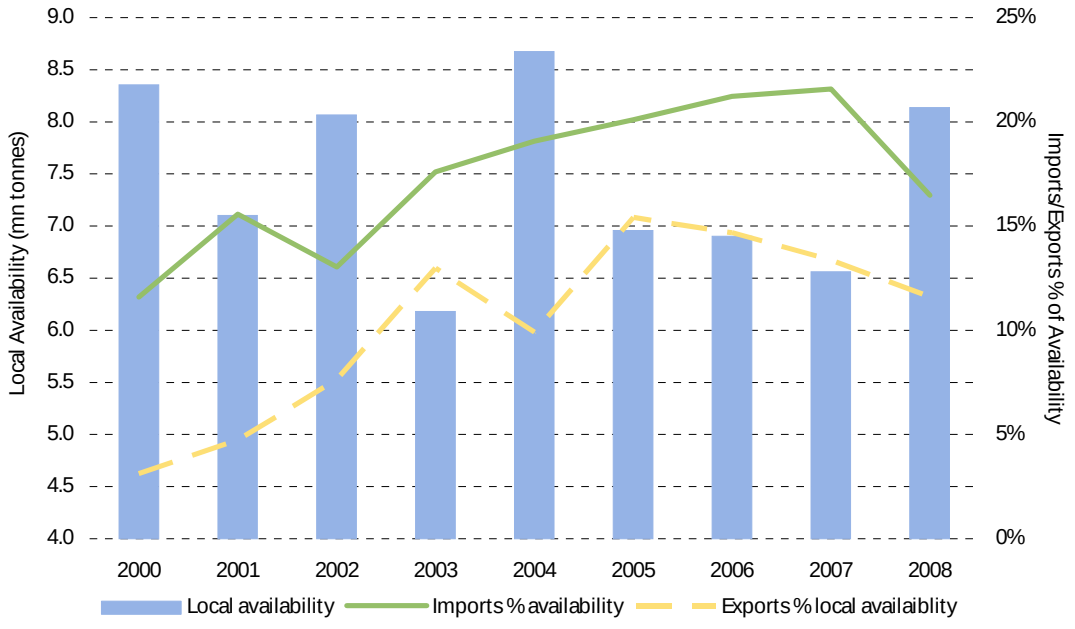
For exports, the system of export refunds for Annex 1 and non-Annex 1 products (pasta) affects the competitiveness of EU products on the world market. Since February 2000, there have been no export refunds payable on Annex and non-Annex 1 products.

That the value of these measures for durum wheat has been zero since 2000/01 suggests that the sector is market orientated.

9.6.3 Foreign trade as a share of consumption

The market orientation of the sector is reflected in the increased importance of trade. As shown in Chapter 5 and highlighted in Diagram 9.4, the importance of both imports and exports as a percentage of availability has increased, and is now, on average, higher following the reform.

Diagram 9.4: Imports and exports as a proportion of availability



Source: Eurostat

9.6.4 Coupled payments as a proportion of income

For producers, market orientation has increased as the importance of coupled payments in revenue has fallen. As highlighted in Chapter 4, and shown in Table 9.7, coupled payments as a proportion of income have fallen. This is particularly true in 2008, when prices rose and hence the proportion of revenue taken up by the coupled payment fell.

Table 9.7: Coupled payments as % of income

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	post reform
Italy	54%	52%	52%	53%	52%	18%	15%	13%	8%	53%	13%

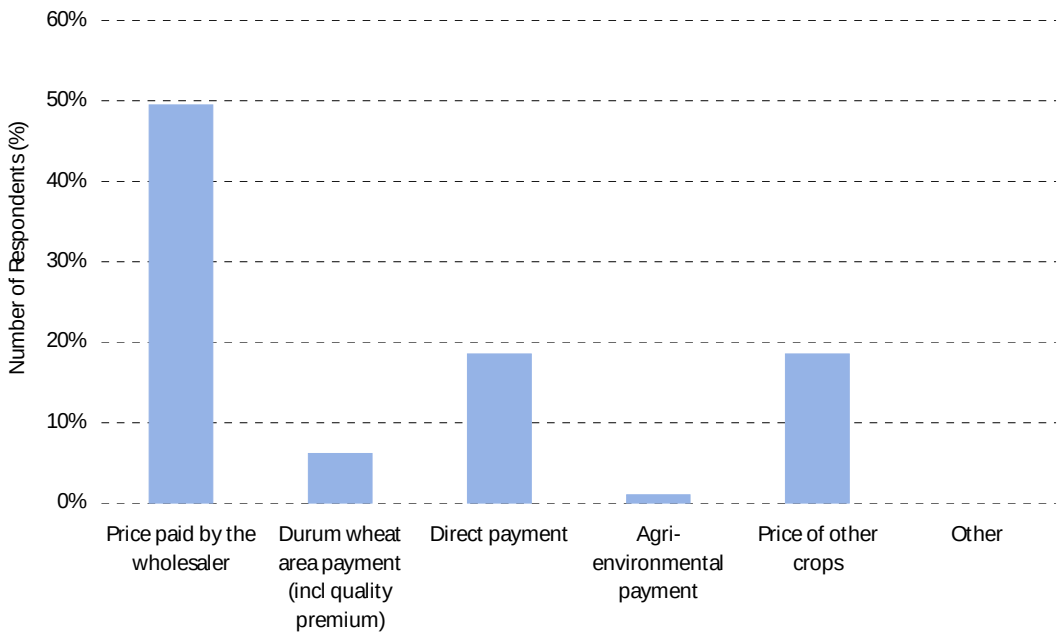
Greece	62%	60%	64%	66%	65%	65%	35%	31%	15%	64%	27%
France	52%	47%	53%	53%	49%	51%	32%	22%	18%	51%	24%
Spain	49%	51%	57%	54%	53%	54%	28%	22%	20%	53%	23%

Source: Eurostat

9.6.5 Determinants of farmers' decision making

As part of the questionnaires, farmers were asked what were the most important influences on their decision to plant durum wheat. In half of the cases, the price paid by the wholesaler was quoted as being the most important. This was followed by the price of alternative crops and the direct (decoupled) payment. That the price of durum wheat and its alternative accounted for close to 70% of the responses points to the market orientation of the sector (Diagram 9.5). That 20% suggested that the decoupled payment was the most important influence in their decision to plant durum wheat suggests either that the question was misunderstood or that a proportion of farmers still regard this payment as coupled. In this case, it is total revenue per hectare that is being taken into account in forming decisions rather than just the coupled components.

Diagram 9.5: Questionnaire Responses, The most important influence on the decision to plant durum wheat



Source: Questionnaire

9.7 Increased competitiveness

9.7.1 Comparison of prices

Comparing export unit values with import unit values gives an indication of the difference between international and internal prices in the EU. Export unit values reflect EU prices, while import unit values reflect international prices. The two series track each other very closely. This points to the competitiveness of production. However, following the reform average per tonne export unit values have been marginally higher than import unit values (see Chapter 4, Diagram 4.39). This is a reverse of the pre-reform situation.

9.7.2 Change in Export Volumes

The competitiveness of production can also be gauged through examining export trends. In the absence of export refunds an increase in exports would suggest that EU production is competitive as it is able to compete on international markets. Diagram 9.6 shows trends in EU-27 exports. The diagram reveals that exports were increasing in the pre-reform period (2000-2004). Exports the peaked in 2005 with the harvest of a large crop and have since declined, although as a proportion of production, exports are still higher than in the pre-reform period.

The rising trend of exports would suggest that competitiveness was improving prior to the reform. That exports have been maintained following the reform suggests that this trend has continued.

Diagram 9.6: EU-27 Exports

9.8 Stable income for producers

As shown in Chapter 4, the reform has not altered producer incomes on a per hectare basis, it has altered the balance between coupled and decoupled payments. The fall in coupled payments has increased the market orientation of the sector.

9.8.1 Proportion of coupled payments in producer income

In terms of the share of coupled payments in producer income, Table 9.8 shows how this has changed for durum wheat and its main competing crops in the four case study MS. It reveals that durum wheat producers have always been the largest beneficiary of coupled support. Although after the reform the share of income derived from coupled payments has fallen, durum wheat still ranks the highest relative to main alternative crops. The only exception is Greece, where the share of coupled payment in producer income is largest for cotton.

Table 9.8: Proportion of coupled payments in producer incomes for durum wheat and alternative crops

	Pre reform	Post reform
Spain		
Durum wheat	52%	28%
Common wheat	35%	9%
Sunflower	39%	12%
Maize (irrigated)	10%	0%
France		
Durum wheat	51%	32%
Common wheat	29%	11%
Sunflower	42%	16%
Maize (irrigated)	32%	8%
Greece		
Durum wheat	64%	35%
Common wheat	29%	0%
Maize (irrigated)	9%	0%
Cotton (irrigated)	0%	39%
Italy		
Durum wheat	52%	16%
Common wheat	37%	11%
Sunflower	33%	11%
Maize (irrigated)	14%	5%

Source: FADN

9.8.2 Comparison of gross margins per and post reform

The reduction in coupled payments following the reform resulted in a fall in gross margins as shown in Diagram 9.7. However, with higher prices in 2008, gross margins recovered. In the counterfactual case, when coupled payments are set to zero, gross margins become negative in France and Greece at 2006 prices.

Diagram 9.7: FADN Gross margins, pre- and post-reform

9.9 Sustainability of agriculture

As shown above, durum wheat is typically a low input-low output crop. Following the reform, there has been no change in the amount of input use per hectare.

While there has been a fall in area under durum wheat, the main beneficiaries of this change among the COP crops were an increase in plantings of common wheat in Spain and Greece. The seat aside area also increased and the total UAA fell particularly in Greece and Italy.

A change to common wheat is broadly neutral in environmental terms as input requirements are similar for durum and common wheat. The effect of a fall in the UAA depends on whether the land is maintained in good agricultural condition or abandoned. The former is assumed to have environmental advantages. Our analysis suggests that following the reform the set aside area (area maintained in good agricultural condition) in the major durum wheat producing countries rose by 450,000 hectares, while the total COP area (including set aside) fell by 570,000 hectares. The suggests an increase in the land that is not farmed.

9.10.1 Farm Labour use durum wheat

As discussed in Chapter 7, labour use comprises paid and unpaid labour, the majority of use is unpaid labour. Per hectare requirements vary by MS as shown in Table 9.9. With the reduction in the area under durum wheat, total labour requirements have fallen.

Table 9.9: Total durum wheat labour requirements

	Hours per hectare		Area		Total Labour Requirements (days)	
	Pre-reform	Post-reform	Pre-reform	Post-reform	Pre-reform	Post-reform
Italy	77	74	1,677	1,396	18,263	15,201
Spain	42	35	906	613	5,318	3,600
France	32	24	258	268	1,138	1,182
Greece	125	83	696	626	11,798	10,607
Total			3,538	2,903	36,518	30,589

Source: FADN, Eurostat, LMC (see Table 7.4)

9.10.2 Labour use for alternative crop

The net effect on employment is dependent upon what crops farmers switched to, if farmers switched to crops requiring more labour, the effect on employment would be positive. As shown in Chapter 7, across all countries, maize is the most labour intensive crop in terms of hours per hectare. For the other crops, according to the FADN sample labour requirements vary by country. In Italy and France, common wheat uses more labour than durum wheat, while in Spain and Greece the opposite is true. Labour use for sunflower is higher than durum wheat in Italy and Greece but lower in France and Spain.

However, despite some switching between crops, in most cases, the fall in durum wheat area resulted in an increase in set aside, and a reduction in the total COP crop area. That a smaller area is being farmed suggests that per hectare employment levels (both paid and unpaid) have fallen.

9.10.3 Processing industry employment

Over time, the number of durum wheat mills has fallen. This suggests that the number of people employed by durum wheat mills has also fallen. This has occurred as the industry has consolidated, rather than an affect of the change in regime.

The number of pasta factories in the EU has over the period of the evaluation, with the majority of the reduction occurring prior to the change in regime. This has occurred as the industry has consolidated. Over the same period, direct employment has fallen. The majority of this fall occurred prior to the change in regime. Since the introduction of the reform, direct employment has fallen by 11%. Like the milling sector, these changes are attributable to developments within the sector, rather than to CAP policy changes.

9.11 Conclusions

Q.7.2. To what extent are the CAP measures supporting durum wheat after the 2003 reform coherent with the principles of the reform of the CAP (first and second pillar) and with overall EU objectives?

The reform has broadly been coherent with the objectives of the CAP reform, although it must be stressed that this judgement is made on just two to three years worth of evidence. Some of the impacts require a longer time period to work themselves out:

- Market orientation has increased, as the level of coupled payments as a proportion of revenue has decreased, the level of international trade has increased, and farmers consider prices and durum wheat and alternatives as the most important determinants of planting decisions.
- Competitiveness has been maintained. The level of exports has increased and export and import prices are closely aligned.
- Reasonable prices to producers have been maintained and international and local prices are observed to generally move together.
- Producer incomes have been maintained, although there has been a switch towards decoupled payments away from coupled payments.

- The environmental impact has been neutral in the sense that there has been no change in production technology. Where the area has switched to common wheat, as far as can be judged, this has not had a negative influence on the environment. The effect of a fall in the farmed area depends on whether the land is maintained in good agricultural condition or abandoned. The former is assumed to have environmental advantages. Our analysis suggests that following the reform the set aside area in the major durum wheat producing countries rose by 450,000 hectares, while the total COP area (including set aside) fell by 570,000 hectares. This suggests an increase in non-farmed land.

- In terms of employment generation, there has been no change in employment in the processing sector as a result of the reforms. The volumes processed have continued to increase. Where employment has fallen this has been due to industry consolidation. Although the level of consolidation has been modest following the reform. The major consolidation occurred prior to the reform.

- In terms of farm employment, this has fallen as areas have been taken out of production and not replaced by other crops. These areas have either been maintained in good agricultural condition or not farmed.

Chapter 10: Conclusions and Recommendations

The 2003 reform of the CAP[31], which is the focus of this evaluation, led to substantial decoupling of payments to durum wheat producers. The most important measures affecting durum wheat production decisions were:

- The introduction of decoupled support to producers through the Single Farm Payment. This support is paid irrespective of planting decisions as long as the area is maintained in a good agricultural condition;
- The ending of coupled support (the supplementary payment for durum wheat, the special aid for non-traditional regions, and the arable crops payment) for all MS, with exception of France and Spain where 25% of the coupled aid for all COP crops was retained;
- The introduction of Aid under Article 69 to support quality improvement in Greece and Italy; and
- The introduction of a quality premium for traditional areas.

Following the reform, border and intervention measures remained unchanged. Import duties on durum wheat are zero and export refunds have been zero since early 2000.

The reform was introduced in different periods across the major producers. In Italy and Portugal it was introduced in 2005, while in France, Spain and Greece the reform was introduced in 2006. This means that the post reform period is just two years in three countries and three years in two countries. In many cases, this is a limited time period for drawing firm conclusions.

Within the framework of the 2003 policy reform, there has been a degree of flexibility in the implementation of the measures. This has resulted in significant differences between Member States: in two of the main producers, France and Spain, a proportion of the Aid has remained coupled, while in Greece and Italy, although Aid was fully decoupled, Article 69 was used to support the sector, by granting support for quality improvement. In Portugal, Aid was completely decoupled, with the exception of the quality premium. This makes generalisations on the outcome of the policy reform difficult.

A key tool for our evaluation has been to determine the effect of the policy change on gross margins. In this case, revenue is dependent upon both market prices and the coupled aids. This gives a common basis for analysing changes between countries, but makes no distinction between the specific coupled payments. In this regards, partially coupled aid in France and Spain is treated in the same way as Article 69 aid in Greece and Italy. This means that in evaluating the impact of the reform, it is the effect of the combination of the various measures that is analysed as this is what producers see with the change in gross margins. It is difficult to attribute effects to individual measures. In a counterfactual case, where all coupled support for durum wheat and competing crops is set at zero, the effect of full decoupling can be assessed.

In addition, changes in gross margins and the area under durum wheat are not just caused by the measures. Market forces, as revealed by the underlying level of prices, also have an impact. This is apparent in the post reform period, when durum wheat prices and input costs rose to very high levels in 2008. Consequently, in analysing gross margins, we divide the post reform period into two periods: 2006-2007 and 2008. During the 2006-2007 period costs and prices were at a similar level to those pre-reform. In 2008, durum wheat prices rose to very high levels and production costs rose strongly.

[31] *Council Regulation (EC) No 1782/2003 of 29 September 2003 (OJ L270, 21.10.2003 p.1-69)*

While the overall objective of the 2003 reform was to increase market orientation in the agricultural sector, the specific objective of the reform to the durum wheat sector was the maintenance of the role of durum wheat production in traditional production areas while strengthening the granting of the aid to durum wheat respecting certain minimum quality requirements. Market orientation does not necessarily mean the maintenance of production or an improvement in quality. Our analysis of Italian experimentation station data suggests that there is an inverse relationship between quality (as measured by the protein content) and yields. Protein content is found to be higher in the lower yielding varieties.

Discussions with the industry suggested that an important part of the quality premium is to cover the higher cost of certified seed, thus the objective of the quality premium is seen as both promoting quality and ensuring the provision of research.

The different objectives have led to a different interpretation between Member States as to the most important objective. In France and Spain the partially coupled Aids have sought to maintain production in traditional areas, while in Greece and Italy, the use of Article 69 has sought to improve quality. In this latter case, by increasing Aid, Article 69 will have also had the effect of helping maintain production.

As part of the evaluation, interviews (via a questionnaire) were held with 96 farmers in the case study regions. These questionnaires give valuable information on the sector. However, they are not supposed to be statistically representative of the sector but they do give an indication of trends in the durum wheat producing areas.

10.1 Effect of the measures on primary production and on structure of production

The effect of the measures can be seen though an examination of the supply-demand balance, as presented in Table 10.1. Not all the changes to the supply-demand balance can be attributed directly to the reform or to specific measures of the reform, but the Table does show how the EU durum wheat market has evolved over the review period. The main influence on the supply-demand balance outside of the reform has been the changes to market prices, particularly the rise in prices and costs in 2008. A number of observations can be drawn from the Table as outlined below.

Table 10.1: Durum wheat EU-27 supply-demand balance ('000 tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-reform	Post reform
Production	10,093	8,941	10,224	8,832	12,628	9,369	9,365	8,521	10,156	10,144	9,353
Imports	*1,095*	*1,305*	*1,207*	*1,358*	*1,713*	*1,807*	*1,948*	*1,990*	*1,615*	*1,336*	*1,840*
Total supply	11,188	10,246	11,431	10,190	14,341	11,176	11,313	10,511	11,771		
Non-feed use											
Feed use	*483*	*477*	*484*	*798*	*2,017*	*359*	*626*	*327*	*257*	*852*	*392*
Seed use	*937*	*955*	*1,002*	*975*	*1,028*	*917*	*747*	*698*	*756*	*979*	*780*
Exports	260	336	617	802	859	1,073	1,013	876	945	575	977
Losses	58	69	56	77	51	61	63	58	61	62	61
Change in stocks	5	28	14	- 179	1,408	- 219	-330	-675	- 44		
Availability for millers	9,445	8,380	9,259	7,716	8,979	8,984	9,195	9,226	9,796	8,756	9,300

Note: Feed is based on Eurostat data to 2004, there after estimates based on ONIGC. According to the Semouliers Association, feed use peaked in 2004/05 at 1 million tonnes and fell to 0.1 mn tonnes in 2007/08
Seed use is based on the assumption of 250 kg of seed per ha
Pre-reform period is assumed to run 2000 to 2004, post reform 2005 onwards. This is a line with the introduction of the reform in the largest producer Italy.,
Stock change based on Eurostat and ONIGC

Source: Eurostat, UNSEN, LMC

10.1.1 Effects on production

While most aids to the durum wheat sector have been decoupled, partial coupling in France and Spain provides assistance for production. In additional, the measures that are targeted towards quality improvement, the quality premium and Article 69 in Italy and Greece, by increasing coupled income, increase the gross margin and provide support to durum wheat production.

Durum wheat production fell following the reform, from an average of 10.0 million tonnes, to an annual average of 9.4 million tonnes, a fall of 6%. With the fall in coupled payments, gross margins initially fell and the area under durum wheat declined. However, the post reform period can be divided into two parts 2006-2007 and 2008. In 2008, durum wheat prices rose to very high levels and production costs rose strongly. The net impact was a rise in gross margins back to pre-reform levels. This encouraged a recovery in production. If 2008 is removed from the analysis then production fell by 9%.

The fall in production has not been uniform across countries, average production fell by 13% in traditional regions and areas rose by 64% in non-traditional regions. Post-reform the traditional area accounts for 85% of production, compared to 91% of production pre-reform. The reforms have therefore not ensured the maintenance of production at levels that existed prior to the reforms in traditional areas.

The area under durum wheat has fallen by a greater proportion than production (average yields have risen). Among the five largest producers (Italy, Greece, Spain France and Portugal) the area under durum wheat fell by 20% following the reform from an annual average of 3.8 million hectares prior to the introduction of the reform to 3.0 million hectares post reform. Of the other EU-15 producers, the area fell in the UK, but rose in Germany and Austria.

The change in production has not been the same across countries. The trends for the major producers, who account for over 98% of EU-27 production over the review period, are highlighted below:

- In France, there has been little change in area or production in traditional areas, although in non-traditional areas production has increased. In the latter case, while the non-traditional area has increased, albeit from a low base, it still represents a minor part of individual farmers' crop area. This increase in area is attributed to farmers wishing to diversify their plantings and the increased profitability of durum wheat over common wheat.
- In Italy, the area under durum wheat has fallen, however yields have risen and the net effect as been a smaller fall in durum wheat production in traditional areas following the reforms. The fall in area means that the total utilised agricultural area has fallen. It has not switched to other crops. Plantings in non-traditional areas have also increased due to the abolition of compulsory set aside and an increase of plantings on areas that were previously planted with sugar beet.
- In Greece, the area under durum wheat has fallen, yields have been maintained and hence production has fallen. As with Italy, it is the most marginal land that has been taken from production. In terms of switching production between crops there has been some increase in the area under common wheat.
- In Spain, the area under durum wheat has fallen. Yields have been maintained and hence production has fallen. The changing of the aid regime has altered the ranking of gross margins between durum wheat and common wheat and hence the area under common wheat has increased relative to durum wheat in the case study region of Andalucia.

- In Portugal, the durum wheat area and production collapsed as gross margins fell relative to common wheat. The common wheat area increased to compensate for the lower durum wheat area.

The degree to which the measures have supported production can be seen by examining the counterfactual case, where all coupled support is removed. Using simply supply elasticities, to estimate the change in area resulting from a change In the gross margin and assuming that yields remain at 2008 levels our analysis suggests that in the absence of coupled support, production would fall by a further 4% at 2008 prices and costs and 18% at 2006 prices and costs.

10.1.2 Effects on structure of production

Based on the results of our assessment, the reform of the CAP measures has led to little structural change, although the post reform period on which this assessment is made is short, just three years. Trends that were apparent prior to the reform have continued. In particular, there has been a trend towards an increasing farm size since 2000. This pattern continued after the introduction of the reform, although there is only limited data to support this conclusion because data are not available for all countries and because the Eurostat survey is only published every two years the most recent data are for 2006/07.

In terms of input use, there is no strong evidence pointing to a significant change in the intensity of input use following the reforms. Labour use in durum wheat production (in terms of hours per hectare) has not changed over the last three years, while the level of investment has either increased or been maintained.

10.1.3 Effects on income

Total farmer's income per hectare of durum wheat remained broadly unchanged following the introduction of the reform. While coupled support fell, this reduction was broadly matched by the decoupled payment. Of our case studies from examining FADN data, this was true of Spain and Italy. In France, the decoupled aid was lower by 9%, while in Greece the decoupled payment was higher than the coupled payment. That the decoupled aid was less in France may be a reflection of the small FADN sample size. For Greece, previous experiences (such as the Study on the Cotton Sector in the EU) revealed that, when filling out the FADN farm return forms, Greek farmers tend to include the subsidy received for a specific crop in the price paid to them. At the same time, however, the subsidy can also be recorded separately in the relevant section of the form, thereby leading to a "double counting" of the subsidy received. In light of this, for Greece only, we cannot draw clear conclusions based on the evidence of this analysis alone. The FADN data are limited to the extent that the sample of farms changes each year. Where possible we have made use of cohorts of data. However, this limits the number of farms and a sample of sufficient size is only available in Italy and Greece.

The changes to coupled payments mean that they now account for a lower proportion of revenue than was the case pre-reform, although this also depends on the level of durum wheat prices. While these changes have lowered gross margins for both durum wheat and competing crops, among our case study countries, the ranking of durum wheat has not changed noticeably following the reform. The only exception to this is Spain, were common wheat is ranks above durum wheat following the reform.

That there is greater flexibility in crop choice following the reform can be seen from the questionnaire responses. The majority of respondents, across countries stated that the coupled payment was less important in determining crop choice than was the case prior to the reform. Respondents cited the price paid by wholesalers as the main reason behind their crop choice.

Further insights into changes in total farm income can be gleaned by examining trends in the FADN data for durum wheat specialists. In three of the countries, Italy, Greece and Spain gross farm income, farm net value added and family farm income are higher after the reform, compared to the three year period prior to the reform. In France, the indicators are lower in the post reform period. However, in the French case, in particular, the number of observations is relatively small. When we examine data for the same cohort of farms in Italy and Greece over the period 2003 to 2006, farm incomes are found to be lower following the reform.

By lowering gross margins, the measures have also negatively impacted the implicit return to (unpaid) family labour. However, the calculation of farm income should include the decoupled payment in the calculation of the implicit wage. Including the decoupled payment reveals that per hour incomes were at a similar level per and post reform.

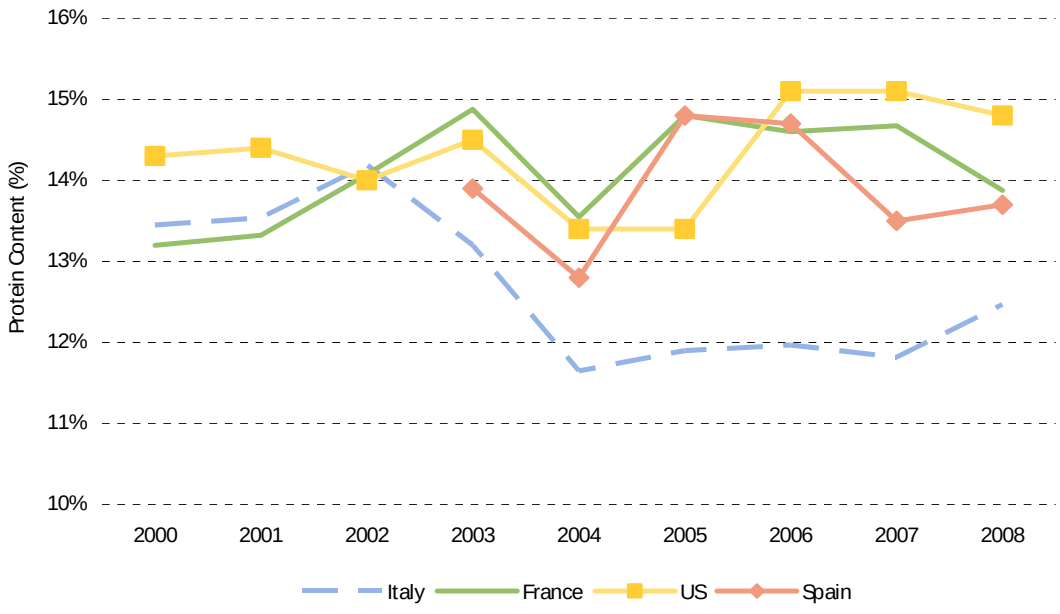
10.1.4. Effects on quality

There are two measures that are specifically targeted towards quality. The quality premium and Article 69 measures in Italy and Greece. There are a number of determinants of quality, the most important being protein content, specific weight and colour. Among the processors protein content was the most commonly cited measure of quality and hence we focus on protein content as our measure of quality.

When asked whether quality had improved following the reform, the majority of processors interviewed across the four case study MS responded that there had been no change. Although a proportion in Italy and Spain cited that that there had been an improvement in quality. This assessment is backed up by field data were it is available: in Italy, protein content has been unchanged since 2004. On average the protein content has been lower following the reform (the annual average falls from 13.2% to 12.3%); in France, the protein content is unchanged following the reform. In Spain, the protein content fell in 2007 and 2008, although there is considerable variability in annual observations.

Italian quality is below that of France, Spain and the US (Diagram 10.1), hence the need of the processing industry to import durum wheat to improve the overall quality level.

Diagram 10.1: Average protein content of Italian, French, Spanish and US durum wheat



Source: Agricultural Research Council (CRA), ONIGC, IGC

While the post reform period only covers three years, there are a number of reasons why quality has not improved following the reform, despite the introduction of a specific policy measures:

- A large number of varieties are eligible for the premium and the quality of these varieties varies. Of the eligible varieties, our analysis suggests that farmers select higher yielding varieties as these will maximise their revenues. Research station evidence in Italy suggests that there is an inverse relationship between yield and quality.
- The implementation of the quality premium is different in each country. In Greece, the requirement is that 80 kg of eligible seed is used per hectare (compared with total use of 250 kg). This limits the potential impact of the premium. In Italy, 180 kg per hectare of eligible seed is required. In Spain, the amount is 250 kg per hectare.
- The large number of eligible varieties and the small farm size mean that there is little consistency in the qualities received by millers.
- Weather conditions, high level of rainfall during the growing season adversely affects quality.

Our analysis suggests that the reform has not met its objective of improving quality. However, this conclusion is based on just three years worth of observations. The effect of the development and use of improved varieties and improved farmer practises may require a longer time horizon.

10.2 Effects on the downstream sector

10.2.1 Processing

The volumes processed by the milling industry have increased (as evidenced by the level of availability in Table 10.1), by on 1% per annum on average since 2000. There has been no change in the trend pre- and post reform. In order to ensure adequate availability, the reduction in production has been met by higher imports and a reduction in stocks.

Most of the milling sector is located in Italy. Over time, the number of durum wheat mills has fallen from an average of 200 pre-reform to 181 post reform. The process of consolidation was apparent before the reform and there is no evidence that the change in reform has caused any change to industry structure or location.

In the pasta industry, which is mostly concentrated in Italy, only limited consolidation has occurred following the introduction of the reform. The average number of plants has fallen by 1% pre- and post reform. Where consolidation has occurred, it is as smaller factories have closed rather than an impact of the change in regime.

There is a general consensus among the processors interviewed that the objective of ensuring sufficient domestic production is important for their needs, although this production does not have to be limited to traditional areas. The desirability of domestic production is due to the higher, largely transport, costs associated with imports and greater perceived risk, in terms of exchange rate movements and availability. In the latter case, this arises due to the importance of Canadian imports and the monopoly on trade held by the Canadian Wheat Board.

Processors are able to substitute imports for domestic production. Price and supply were both mentioned by processors as the main reasons for this suggesting that it is fairly easy to switch between domestic and imported durum wheat. This is confirmed by the inverse relationship between the change in production and the change in imports.

Even given increased imports in recent years, imports still account for under 20% of total availability, the majority of production is sourced locally.

10.2.2 Quality

Trends in quality vary across the EU. In Italy, the largest market, interviews with processors revealed that the quality of the domestic crop is not sufficient to meet the industry's requirements. The fragmentation of supply was cited as being the main obstacle to achieving a consistent level of quality in line with the industry's requirements. This means that imports of high quality durum wheat, which are then mixed at the mills with domestic production, are required to achieve the desired quality level. This is particularly an issue in Italy. This was confirmed by the outcome of our analysis of trends in durum wheat quality. Post reform, the average annual protein content of Italian durum wheat was unchanged from that of the two years prior to the reform. At the same time, the US and Canada, which produce high quality durum wheat, are the main origins of extra-EU imports into Italy, while France is the main EU origin.

Our analysis revealed that no change in the quality of French durum wheat over the same period, while no clear conclusions could be drawn for Spain.

Our assessment indicates that, following the implementation of the reforms, quality has been largely unchanged. However, this conclusion is based on just three years worth of observations.

Millers and pasta producers across the EU try to ensure that the domestic supply of durum wheat meets the desired level of quality by offering a premium for higher quality durum wheat. The outcome of the processors' survey indicated that over 70% of millers interviewed across the four case study MS pay a quality premium to their suppliers. Looking at the farm sector, around 40% of the sample of farmers surveyed have a contract with a trader or a processor. Quality is included in the contract for more than 50% of the sample of respondents.

10.3 Effects on markets

10.3.1 Price

Our assessment found no clear evidence that the 2003 CAP measures promoted price stability within the EU market. In Italy, prices were more stable post reform, while in France, Greece and Spain stability was greater in the years prior to the implementation of the reform. Again, there are only a limited number of data points to support this observation.

Comparing per tonne export unit values with per tonne import unit values gives an indication of the difference between international and internal prices in the EU. Export unit values reflect EU prices, while import unit values reflect international prices. Our analysis reveals that the two series track each other very closely. That this is the case points to reasonable pricing for consumers as EU prices reflect international prices and the competitiveness of the sector.

10.3.2 Trade

With the fall in production, imports rose, although imports began to rise ahead of the reform in 2004. That there is no import duty on durum wheat has aided the EU's participation in world trade. This did not change following the reform. Over the review period, a key reason for imports has been to import high quality durum wheat to increase the average quality of durum wheat flour to the downstream industry. However, imports have also been used to cover any domestic production shortfall.

Like imports, exports of durum wheat have also risen significantly since 2000/01, albeit from very small starting volumes. This occurred despite any change in policy. While the system of export refunds, pre-dating the 2003 reform, was retained following the reform, the percentage of durum wheat exports made with export refunds has been zero since early 2000.

Pasta exports have remained fairly stable over the review period, at just below 0.7 million tonnes, *tel quel*. The fall in 2008 was attributed to one processor opening an operation in the US, thus reducing the need for exports. The 2003 CAP measures do not seem to have had any discernible effect on exports of pasta and couscous. Like durum wheat exports, all pasta exports were made without the benefit of export refunds.

The increase in trade volumes, both inwards and outwards, has been encouraged by market developments, i.e., the need to import higher quality durum wheat, supplement any supply shortfall and the growth of export markets. Measures affecting trade pre-date the 2003 reform and there have been no import duties or export refunds in force following the 2003 reforms. Based on this consideration, it can be argued that the 2003 measures did not alter the EU's participation in international trade.

10.4 Effects on rural areas

10.4.1 Economic viability

For durum wheat, the effect of the reform on economic viability can be measured in terms of changes to gross margins and the return to labour. In the former case, in the extreme, when the gross margin falls below zero, production would be expected to cease and the crop is no longer viable. When the gross margin of durum wheat is reduced relative to that of alternative crops, production would be expected to switch to the crop that is more viable with a higher gross margin.

Our analysis of gross margins reveals that gross margins (for both durum wheat and competing crops) and in return to unpaid labour fell following the reform. The effect of this was different in each MS: in Italy, farmers reduced the area under durum wheat and the total UAA fell. In Greece, the total UAA fell, while in other cases, farmers switched to common wheat. In Spain, farmers abandoned durum wheat farming in favour of common wheat, while in France the viability of durum wheat production was not affected. As a result, area under durum wheat was unchanged.

A further effect of the reform could be to facilitate structural reform by encouraging the least competitive farms to leave the industry while the most competitive farms increase their size. As the reform only occurred two to three years ago, depending upon the MS, it is still too earlier to determine whether the reform has facilitated this structural change. There is weak evidence to suggest that farm sizes are increasing, however, this appears to be the continuation of a trend that began ahead of the reform, rather than a trend started by the reform.

The evidence of two to three years data following the reform suggests that the 2003 reforms did not promote the economic viability of durum wheat production, when this is assessed in terms of gross margin advantage and return to unpaid labour. However, the increase in decoupled payments has reduced farmers' risk. Farmers' incomes are now no longer fully dependent upon the returns to a particular crop or a combination of crops. By reducing risk it can be argued that economic viability for the rural areas as a whole has been enhanced.

10.4.2 Employment

The effect of the reform on employment needs to be split between changes in farm and processing industry employment.

At farm level, we base our analysis on changes in the number of farms producing durum wheat and per hectare employment. On this basis, following the reform, farm employment from durum wheat has fallen due to a smaller number of farms growing durum wheat and a lower crop area. In the case of a lower number of farms, there is also weak evidence of an increase in farm size. This further reduces employment requirements. According to an analysis of the FADN data per hectare labour requirements fall as size increases.

Both the FADN data and questionnaire responses suggest that, on average, the per hectare amount of time spend on durum wheat production has not changed. The net effect on employment is dependent upon what crops farmers switched to. If farmers switched to crops requiring more labour, the effect on employment would be positive.

With a lower farmed area in Italy and Greece following the reform employment requirements have fallen. In France, Spain and to a degree Portugal, the switch to alternative crops means that the fall in employment was limited or virtually non-existent. A switch from durum wheat to common wheat is neutral in terms of employment as labour requirements are similar.

Within the processing industry, employment levels have fallen as the industry has consolidated. This consolidation began before the introduction of the reform and has continued. Changes in processing employment can not be attributed to the effect of the reform.

10.5 Efficiency, management and administration

The CAP measures have been relatively efficient in maintaining production. While coupled payments (focussed at both production and quality) have fallen by close to 80%, durum wheat production in the EU 27 declined by 5%. Within traditional areas, the fall has been greater close to 13%.

In terms of quality improvement, the reforms have not been efficient at an EU wide level although a three year period is a short time period over which to make this judgement. In Italy, the average quality (in terms of protein content) has not changed compared to the two years prior to the reform. In France, no significant changes in the level of quality could be seen post reform. In Spain, quality deteriorated marginally.

In terms of administrative burden, prior to the reform producers were required to notify the authorities of the area under durum wheat, this was verified and then payments made, the amount depending upon whether the area was a traditional or non-traditional area. Following the reform a number of points can be made:

- Producers are still required to document the area under durum wheat, there is no change pre- and post reform.
- The quality premium details of both the variety and quantity of eligible seed per hectare are required. The same applies to details of the varieties that receive the premium under Article 69, for the MS applying this measure. This has increased the administrative burden.

As our analysis suggests, the reform has not added to the overall administrative cost of the CAP measures from the point of view of national paying agencies. The conclusion is drawn on

the basis of an analysis of French data where a partial decoupled model was adopted. Similar data were not available for the other producing countries. Within the durum wheat sector, the administrative requirements for farmers have not been simplified.

10.6 Relevance and coherence

In terms of the impact of the CAP measures on the environment, the net effect is zero or slightly positive. The input use of durum wheat or its main competing crops on a per hectare basis has remained unchanged following the reform. Across the EU 27, where the area under durum wheat fell, in a minority of cases farmers switched to common wheat. This is neutral in terms of environmental impact as the level of input use is broadly similar to durum wheat. The UAA is also observed in the traditional areas, particularly in Italy. The effect of this depends on whether the land is maintained in good agricultural condition or abandoned. The former is assumed to have environmental advantages. Our analysis suggests that following the reform the set aside area in the major durum wheat producing countries rose by 450,000 hectares, while the total COP area (including set aside) fell by 570,000 hectares. This suggests that a proportion of the land is no longer farmed.

The reform has broadly been coherent with the wider objectives of the CAP, although it must be stressed that this judgement is made on just two to three years worth of evidence. Some of the impacts require a longer time period to work themselves out:

- Market orientation has increased, as the level of coupled payments as a proportion of revenue has decreased, the level of international trade has increased, and farmers consider prices of durum wheat and alternatives as the most important determinants of planting decisions.
- Competitiveness has been maintained. The level of exports has increased and export and import prices are closely aligned.
- Reasonable prices to producers have been maintained and international and local prices are observed to generally move together.
- Producer incomes have been maintained, although there has been a switch towards decoupled payments away from coupled payments.
- The environmental impact has been neutral in the sense that there has been no change in production technology. Where the area has switched to common wheat, as far as can be judged, this has not had a negative influence on the environment. The effect of a fall in the farmed area depends on whether the land is maintained in good agricultural condition or abandoned. The former is assumed to have environmental advantages. Our analysis suggests that both set aside and the non-farmed area have increased.
- In terms of employment generation, there has been no change in employment in the processing sector as a result of the reforms. The volumes processed have continued to increase. Where employment has fallen this has been due to industry consolidation. In the limited period since the reform, the level of consolidation has been modest following the reform. The major consolidation occurred prior to the reform.
- In terms of farm employment, this has fallen as areas have been taken out of production and not replaced by other crops.

10.7 Recommendations

10.7.1 Introduction

As highlighted above, while the overall objective of the 2003 reform was to increase market orientation, the specific objectives for the durum wheat sector were different as set out in recital 35 of the regulation: the maintenance of the role of durum wheat production in traditional production areas while strengthening the granting of the aid to durum wheat respecting certain minimum quality requirements. Consequently, due to different national circumstances and preferences there has been a different approach between MS. In France and Spain the partially coupled Aids have sought to maintain production in traditional areas, with differing degrees of success, while in Greece and Italy, the use of Article 69 has sought, with little success, to improve quality.

Under the CAP Health Check, coupled support to durum wheat is to be phased out in 2010. Our analysis suggests that this is likely to lead to a further reduction in the area under durum wheat as gross margins fall. For some producers, at certain prices, gross margins will probably even become negative. Where this happens producers will either switch production to crops where margins are higher, or cease farming these areas all together (with the land either being abandoned or maintained in good agricultural condition in order to benefit from the single farm payment).

10.7.2Recommendations

- One of the expected impacts of decoupling in the longer term would be to see the least efficient farms leave the industry, while more competitive operations expand their area. Our analysis of FADN data suggests that variable costs are lower for larger farms. This suggests that an alternative solution to a reduction in area, in areas where agricultural and climatic conditions mean that there are no alternative crops, could be to encourage the farming of larger areas. The benefit of an increase of area size is that per hectare production costs are found to be lower on larger farms, this then leads to higher gross margins. However, farmers must also foster competitiveness in other ways e.g. by organising economies of scale, pooling of costs, equipment and labour, cooperation in financing of activities and marketing and by training that is beneficial for increasing productivity.

- The ending of the quality premium could have ramifications on durum wheat research. At present a proportion of the quality premium is used to cover the higher cost of certified seed. In many markets, with the exception of Italy, durum wheat production is relatively small compared to total COP crop production. In the absence of the quality premium, there is a danger that certified seed use falls and durum wheat research declines. Maintaining and enhancing competitiveness of the sector in the long run would require that enough funds are available for research.

- Our analysis suggests that the quality objective has not been met, despite the introduction of a quality premium and Article 69 in Italy and Greece. The quality premium is to be abolished in the 2010 reform and as improvement of quality is still relevant for competitiveness, the issue of a reward mechanism for higher quality from the perspective of the industry needs therefore to be addressed. With the ending of the quality premium this will no longer be a public policy issue (unless payments are made under Article 68). As the examples in the report show the private sector is already paying in some cases.