Executive Summary

The objectives of this study are to:

- Assess the impact of the changes to the cotton regime on cotton production and the profitability of cotton vis-à-vis alternative crops;
- Assess the impact of the reform in the regime on the ginning industry; and
- Assess the impact of different policy scenarios on producers and ginners.

THE EU COTTON REGIME

The EU cotton regime was introduced in 1981 with the accession of Greece to the Community. It was extended in 1986 with the accession of Spain and Portugal.

The system is intended "to support cotton in the regions of the Community where it is important for the agricultural economy, to permit producers concerned to earn a fair income and to stabilise the market by structural improvements at the level of supply and marketing."[1]

Principles

Prior to the reform approved in 2004, the basic principles of the regime were that:

- Producers received a minimum price per tonne for unginned cotton.
- This price comprised an unginned cotton price, derived from the world ginned cotton price, plus a payment from the EC.
- The payment from the EC was made to ginners, who transmitted it to growers.
- When cotton production exceeded certain reference levels, the minimum price was reduced to discourage over-production.

The cotton regime was reformed in 2004, with the reforms introduced in 2006. Aid to the sector was transformed from one based on price supports to one relying on an area payment, which was partially decoupled. The decoupled component (65% of the Aid) was paid irrespective of the production decision, while the coupled payment was triggered by the opening of the cotton boll rather than harvest. The split between payments is summarised in Table EXEC 1.

[1] Protocol 4

Table EXEC 1: Cotton Area Payments in 2006 (€/hectare)

	Base Area ha	Decoupled Payment 65%	Coupled Payment 35%
Greece [1]	370,000	966	594 - 342.85
Spain	70,000	1,358[2]	1,039
Portugal	360	1,202	556

Note: 1. For Greece €594 per ha is payable on 300,000 ha and €342.85 on 70,000 ha.
2. The decoupled payment for Spain was reduced below 65% as 10% of the payment was replaced by a coupled payment. This was permitted under Article 69 of Regulation 1782/2003

Source: DG Agri.

The reformed cotton regime was challenged by the Spanish Government. The Court of Justice found against the EC and annulled the reform. This was due to a breach of the principle of proportionality on two grounds:

- The EC failed to carry out an impact study; and
- The EC failed to include direct labour costs in its calculations.

The regime was allowed to continue until a new regulation was drawn up.

Regime Expenditure

Under the old regime, EC expenditure on the regime comprised two components:

- Aid to the growers; and
- An administrative fee paid to the ginners.

Expenditure on cotton aid had a floor of €770 million. During periods when this level of expenditure was not reached (1996, 1998 and 2001), a higher price was paid to growers. Expenditure peaked at €952 million in 2005.

Between 2001 and 2005, the annual average amount paid to growers was €761 million, while the administrative fee paid to the ginners averaged €78.3 million.

Under the reformed regime, the total cotton aid was set at €803 million, based on average expenditure over a reference period (2001 to 2003). The budget was allocated as: rural development €22 million, decoupled aid €502 million, coupled aid €275 million and creation of Inter-branch Organisations €4 million.

The ginners do not receive any of the Aid.

THE EU COTTON SECTOR

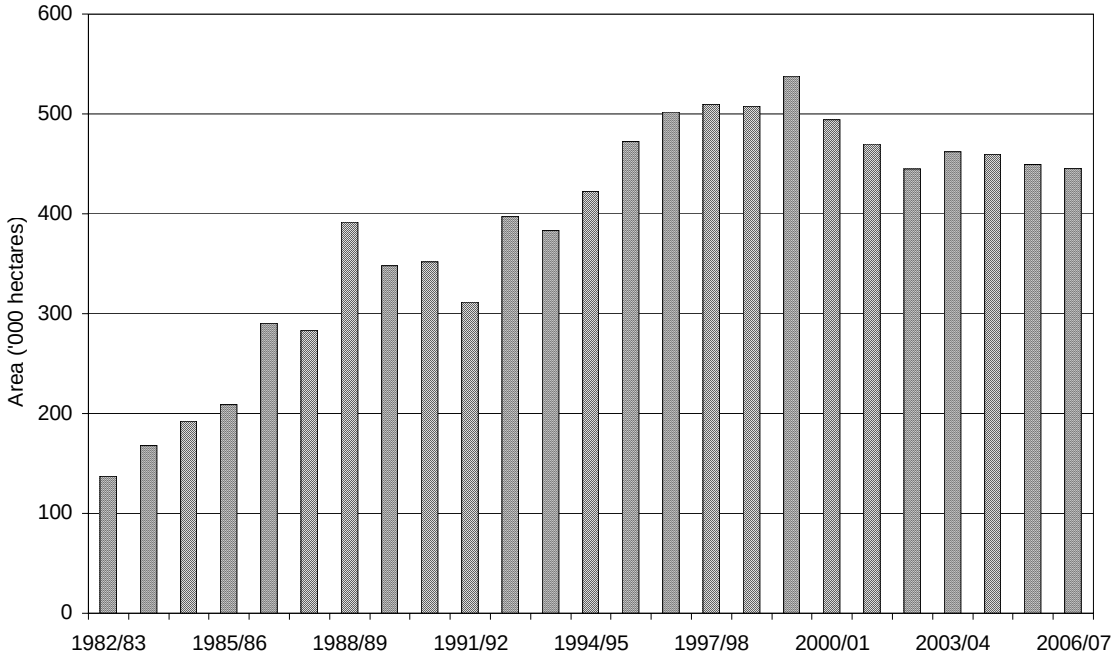
Cotton Production

Cotton is produced in four EU-27 states, namely Greece, Spain, Portugal[2] and Bulgaria. Greece and Spain dominate.

The EU-15 cotton area grew steadily until the end of the 1990s, peaking at almost 540,000 hectares in 1999/2000. Since then the area under cotton has stabilised (Diagram EXEC 1).

Greece is the largest producer. There are 79,700 farmers involved in cotton farming. Cotton accounts for 9.1% of final Greek agricultural output. The majority of farmers grow between 2 and 5 hectares of cotton.

Diagram EXEC 1: EU Cotton Area



Note: Spanish data are only included following accession to the EU (1986/87)
Source: DG Agri

Andalucia accounts for 98% of cotton output in **Spain**. 9,500 farmers in the region are cotton producers. Cotton accounts for 1.3% of Spanish agricultural output and 4.9% of agricultural output in Audalucia.

Most Spanish farmers grow under 10 hectares of cotton, but 5% of the cotton farms cultivate over 50 hectares of cotton.

Cotton is a major user of family labour (Table EXEC 2).

[2] In Portugal, unginned cotton was sent to Spain for ginning.

Table EXEC 2: Family Labour Use (hours per hectare per annum)

	Cotton	Durum Wheat	Maize	Sunflower
Makedonia	195	79	194	
Thessalia	220	98	194	
Spain	182	134	103	60

Note: Data collected from a questionnaire puts cotton household labour use lower than that of FADN. For Greece, household labour use varied from 75 to 90 hours per ha, in Spain household labour use varied from 23 to 60 hours per ha.

Source: FADN.

Cotton Ginning

The ginner purchases unginned cotton from farmers and processes it into ginned cotton and cottonseed. The ginners derive most of their income from ginning and related activities. In Greece, a number of ginners also crush cottonseed to produce cottonseed oil and meal.

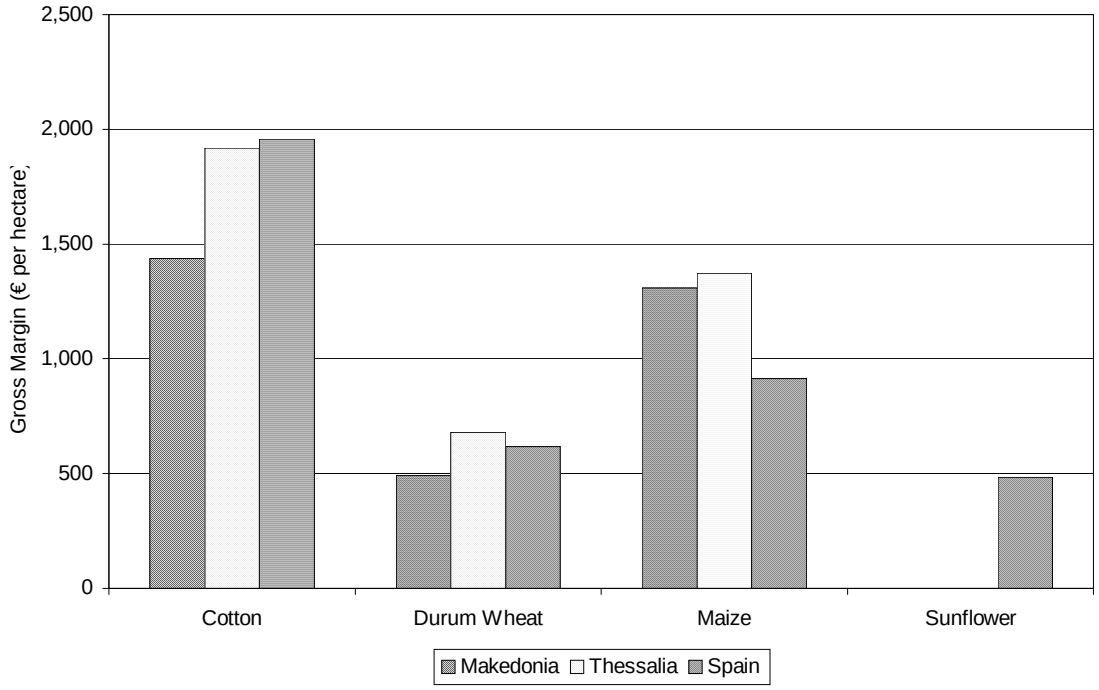
73 ginning mills were active in Greece in 2005/06. On average, each Greek ginning mill employs 10 permanent and 30 seasonal workers; this suggests that direct employment is almost 3,000 workers (730 full time and 2,200 part time).

27 gins were active in Spain in 2005/06. Total employment was estimated at 1,350 workers; 290 permanent and 1,060 seasonal employees.

COTTON REGIME PRE-REFORM

The old cotton regime, based on a per tonne payment, encouraged a high input-high output system. Under this regime, cotton had the highest gross margin and the highest return per day of family labour of the major crops competing for cotton land (Diagram EXEC 2). The level of profitability was such that the incentives were sufficient to maintain production rather than expand it (Table EXEC 3).

Diagram EXEC 2: Gross Margin Cotton vs. Alternative Crops Pre-2006 Reform



Source: LMC

Table EXEC 3: Cotton Area and Production, Pre-2006 Reform

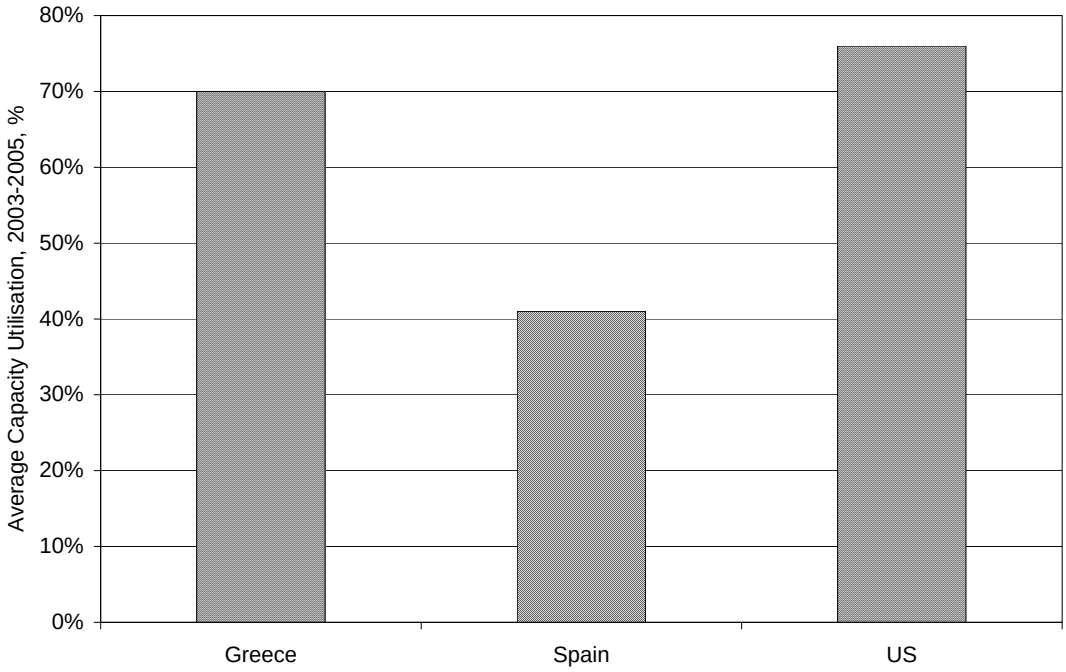
	2003	2004	2005
Greece			
Area (ha)	367,472	369,500	363,000
Production (tonnes)	1,006,248	1,137,229	1,124,714
Yield (t/ha)	2.7	3.1	3.1
Spain			
Area (ha)	94,999	90,297	86,058
Production (tonnes)	305,417	368,097	355,482
Yield (t/ha)	3.2	4.1	4.1

Source: DG Agri.

Prior to the regime change, there was overcapacity in the ginning industry. On a standardised basis[3], capacity utilisation in Greece was estimated at 70% in 2003-2005, and 41% in Spain (Diagram EXEC 3).

[3] The number of days and hours worked per day by each gin varies considerably. As an objective measure of capacity, we have calculated it on the basis of US industry parameters. This puts capacity at 0.86 million tonnes unginned cotton in Spain and 1.60 million tonnes unginned cotton in Greece.

Diagram EXEC 3: Average US and EU Ginning Capacity Utilisation, 2003-2005



Source: LMC

There are a number of reasons for overcapacity:

- Ginning was profitable which encouraged expansion.
- In Greece, high cotton prices between 1995 and 1999 stimulated cotton production. By 2000, Greek ginners had expanded processing capacity to meet the demand for more cotton. Production however, did not increase further.

Ginning unit costs are high by international standards, partly as a result of over capacity. High costs were absorbed by the cotton regime as producers were guaranteed a minimum price per tonne of unginned cotton.

THE REFORM OF THE COTTON REGIME

The change in the cotton regime and the decoupling of the cereal regime[4] have led to a fall in gross margins[5] for producers of both of these crops (total farm incomes were not affected in the same manner, since decoupled payments were increased alongside the reductions in price supports).

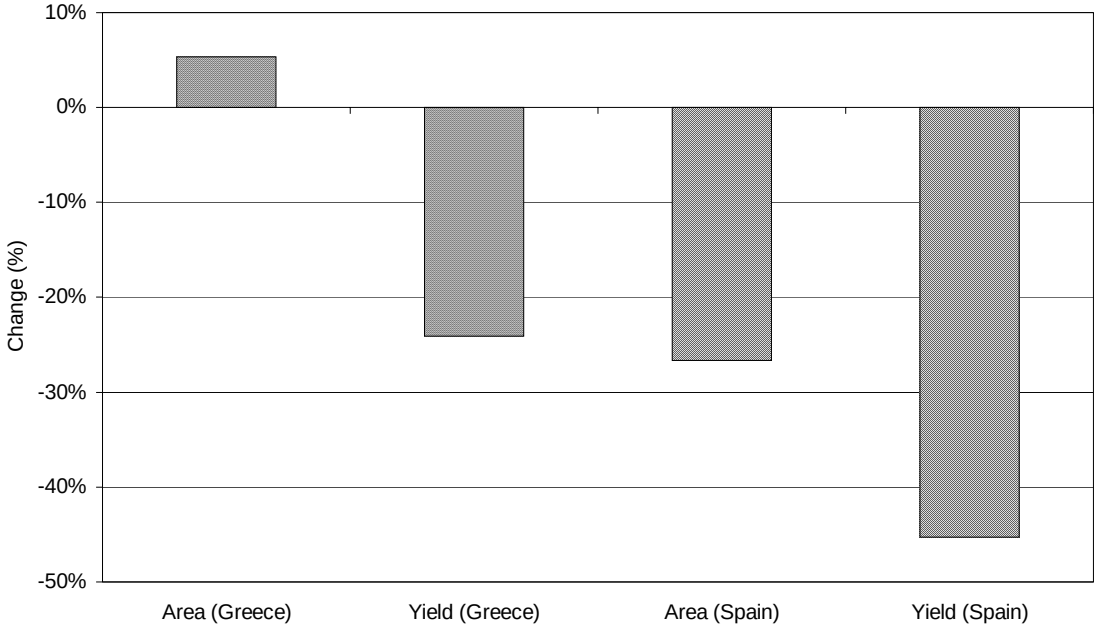
The reactions of producers to this changed situation were very different in Spain and Greece in 2006 (Diagram EXEC 4).

[4] In Greece, cereals were fully decoupled, while in Spain 25% of the support remained coupled.

[5] In the calculation of gross margins, the decoupled payment is not included, since this does not affect returns when producers make their crop choices at the margin.

- Both the area under cotton and yields fell sharply in Spain (by 45% and 27%, respectively).
- In Greece, the area under cotton rose by 4%, while average yields fell in Greece (by 24%). In the latter case, this was caused by poor weather and was not the consequence of regime change.

Diagram EXEC 4: Change in Area and Yields, 2006 vs. 2005



Source: DG Agri

In **Spain**, following the change in the regime, producers faced a number of production options:

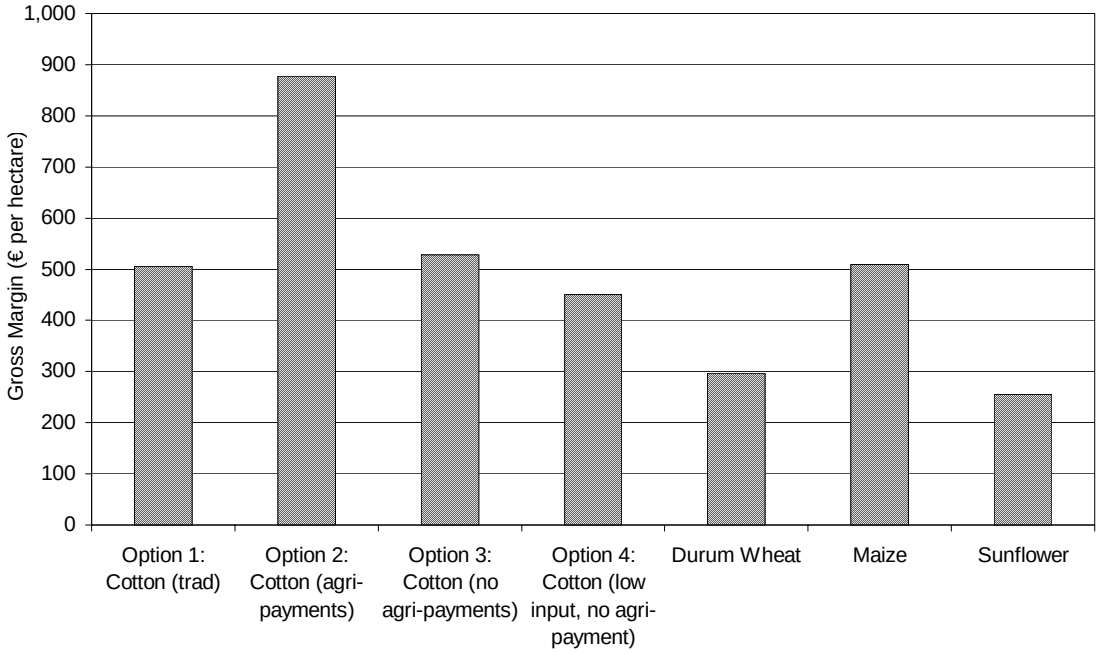
1. To maintain production using traditional production techniques (high input-high output);
2. Reduce input use and then claim an agri-environmental payment, which is paid in addition to the income from the market-determined cotton price and the coupled aid.
3. Reduce input use, but not claim the agri-environmental payment.
4. Reduce inputs to a minimal level, but a level just sufficient to receive the coupled payment.
5. Switch out of cotton to alternative crops. The main alternatives being durum wheat, maize or sunflower.

Following the reform, the gross margin in Spain for cotton is found to be higher than that earned on the main alternatives when agri-environmental payments are received (Diagram EXEC 5). Although these payments are independent of the cotton regime, they have proved to be an important part of the farmers' decision-making process and the area that qualified for the payment increased dramatically in 2006.

For farmers who did not receive the agri-environmental payment, the area under cotton fell as farmers switched to more profitable alternatives.

Where yields are reduced further to a low input-low output system (Option 4), the gross margins fall further. However, in practice, some Spanish cotton producers are reported to have switched to this option. This option affords the least risk, while also requiring the smallest cash outlay. Under this option, if yields are low enough, it can also be advantageous not to harvest cotton.

Diagram EXEC 5: Spain, Gross Margins for Cotton vis-à-vis Competing Crops, After Reform

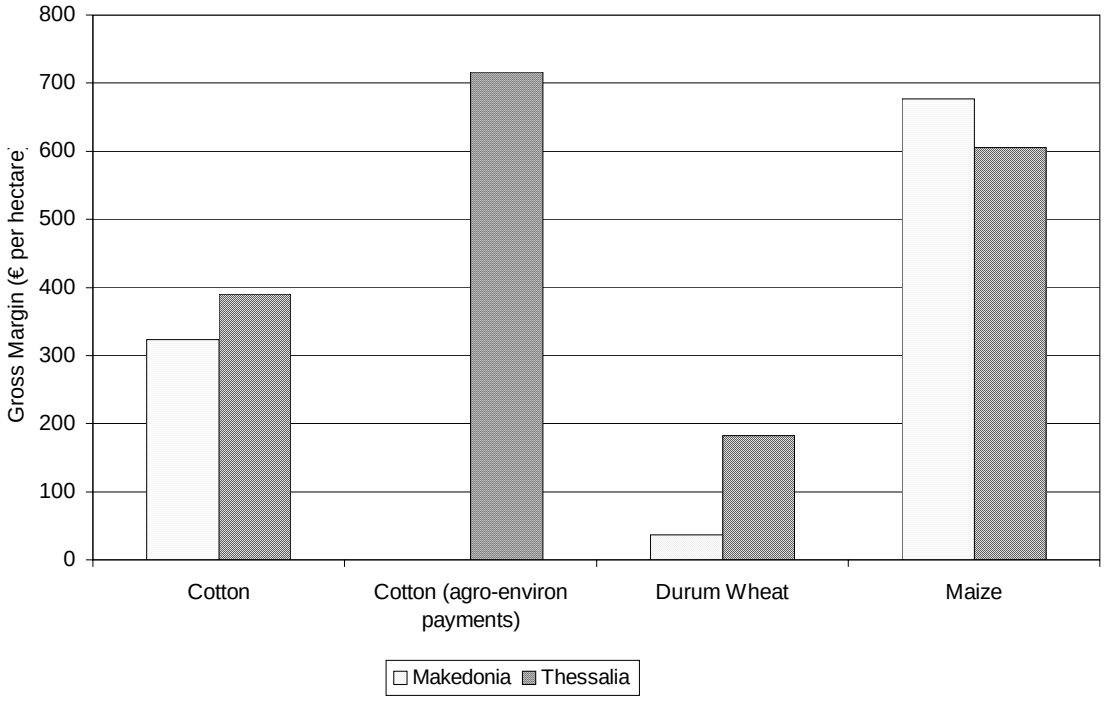


Source: LMC

In **Greece** producers reacted much less than in Spain to the reform and the area under cotton rose in 2006. This was partly because returns to other crops have fallen with the full decoupling of the cereal regime. The returns to durum wheat, the main alternative crop, are below those of cotton (Diagram EXEC 6). The anomaly is maize, which in some cases gives a higher gross margin than cotton, and yet producers did not switch to it. In the short run, this is due to technical and economic factors but also because there is a degree of inertia among Greek producers.

As with Spain, returns to producers receiving agri-environmental payments are higher than for alternative crops. These payments are only available in Thessalia and there has been no increase in the crop area receiving these payments.

Diagram EXEC 6: Greece, Gross Margins to Cotton vis-à-vis Competing Crops, After Reform



Source: LMC

With lower production, **ginning** capacity utilisation fell to 17% in Spain. In Greece capacity utilisation fell to 56%. However, with more normal weather conditions, capacity utilisation would have remained close to 70%.

The regime change has also made a difference is in terms of **quality**. The quality of unginned cotton from the 2006 crop was poor in both Greece and Spain. Some fall in quality was a result of bad weather in Greece, but the greatest impact was a result of poorer farm management.

IMPACT OF CHANGING THE COTTON REGIME

The impact of three alternative sets of measures is contrasted. These measures are:

- A return to a deficiency payment system;
- The 2004 reform, but with the possibility of varying the share of decoupling; and
- Full decoupling.

The Deficiency Payment System

This refers to a system where aid is paid per tonne of unginned cotton. This is the same as the measures in effect prior to the reform. Under this system, the gross margins and returns per day for cotton were considerably higher than those of other crops and we would expect the area under cotton and yields to remain at pre-reform levels (Table EXEC.3, above).

The 2004 Reform, Implemented in 2006

The effects of the reform are discussed above: the area under cotton and yields declined in Spain, but the area was unchanged in Greece. For the gins, capacity utilisation fell in Spain, but would have remained unchanged in Greece with normal weather. In the absence of additional agri-environmental payments in Spain, the area under cotton would have fallen further in 2006 (Table EXEC 4).

Table EXEC 4: Cotton Area and Production, 2004 Reform Scenario

	Reform Scenario	No increase in agri-payments
Greece		
Area (ha)	362,000	
Production (tonnes)	1,122,200	
Yield (t/ha)	3.1	
Capacity Utilisation	69%	
Spain		
Area (ha)	63,119	33,783
Production (tonnes)	164,109	87,835
Yield (t/ha)	2.6	2.6
Capacity Utilisation	19%	10%

Note: Spanish yields are based on questionnaire responses.

Source: LMC

As the level of coupled payment falls, so the gross margin for cotton falls and producers switch to alternative crops.

In Spain:

- A 30% (or €300 per hectare) fall in the coupled payment would lead to a reduction in the planted area of 17,000 hectares. In the absence of agri-environmental measures, the same reduction in the coupled payment would reduce the planted area to 10,000 hectares (Table EXEC 5).
- In terms of production, gross margins are always higher for the medium level input system (Options 2 and 3) than with a high input system (Option 1); hence, average Spanish yields would be expected to be lower than those pre-reform.
- For some producers, a low input-output system (Option 4) may be more advantageous, and this would reduce yields further. Under this system, the incentives are to reduce costs as much as possible in order to maximise the gross margin.
- For ginners, the medium level input options (Options 2 and 3) would mean that capacity utilisation never rises above 25%.

In Greece:

- A 30% (or €160 per hectare) fall in the coupled payment would reduce the cotton area by 100,000 hectares. In terms of production, gross margins are always

higher for the high input-high output system, and hence yields remain around pre-reform levels (Table EXEC 6).

- For ginners, a 30% fall in the coupled payment would reduce capacity utilisation to 49%.

Table EXEC.5: Spain, the Impact of Changes in Coupled Payments

Change in Coupled Payment	Coupled Payment € per ha	Total Area (ha)	Production (tonnes unginned cotton)	Capacity Util %	Area (no agri-env payments) (ha)	Production (tonnes unginned cotton)	Capacity Util % .
+ 50%	1,559	82,625	214,825	25%	77,875	202,475	24%
+ 40%	1,455	80,539	209,401	24%	72,934	189,629	22%
+ 30%	1,351	77,497	201,493	23%	65,787	171,045	20%
+ 20%	1,247	73,416	190,881	22%	56,333	146,465	17%
+ 10%	1,143	68,478	178,042	21%	45,208	117,540	14%
0%	1,039	63,119	164,109	19%	33,783	87,835	10%
- 10%	935	57,540	149,604	17%	23,578	61,304	7%
- 20%	831	51,809	134,704	16%	15,540	40,404	5%
- 30%	727	45,515	118,339	14%	9,812	25,511	3%
- 40%	623	38,193	99,302	12%	6,015	15,639	2%
- 50%	520	29,892	77,720	9%	3,618	9,406	1%

Source: Chapter 5.

Table EXEC.6: Greece, the Impact of Changes in Coupled Payments on the Sector

Change in coupled payment	Coupled Payment € per ha	Area 000 ha	Production 000 tonnes	Yield T/ha	Capacity Util (%)
+ 50%	794	494	1,554	3.1	96%
+ 40%	741	470	1,474	3.1	91%
+ 30%	688	445	1,393	3.1	86%
+ 20%	635	410	1,280	3.1	79%
+ 10%	582	379	1,178	3.1	73%
0%	529	362	1,123	3.1	70%
- 10%	476	320	990	3.1	61%
- 20%	423	295	908	3.1	56%
- 30%	370	262	798	3.0	49%
- 40%	317	241	729	3.0	45%
- 50%	265	220	660	3.0	41%

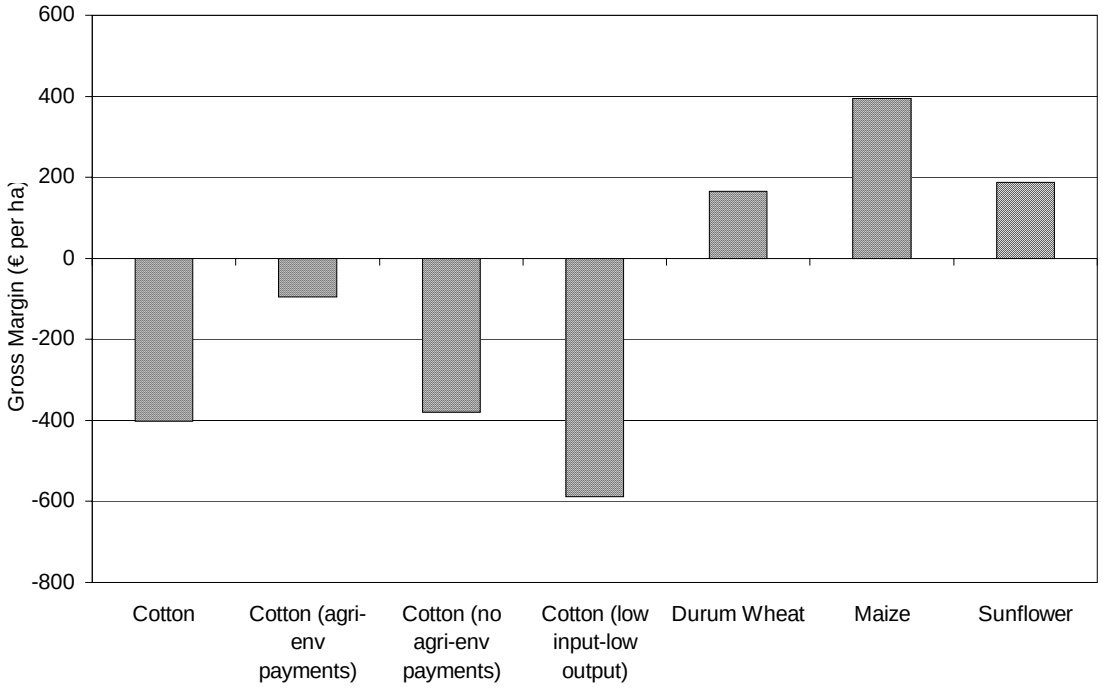
Source: Chapter 5.

Full Decoupling

With full decoupling, when cereals are also fully decoupled, the gross margin for cotton in Spain turns negative (Diagram EXEC 7). Thus the area under cotton falls to zero.

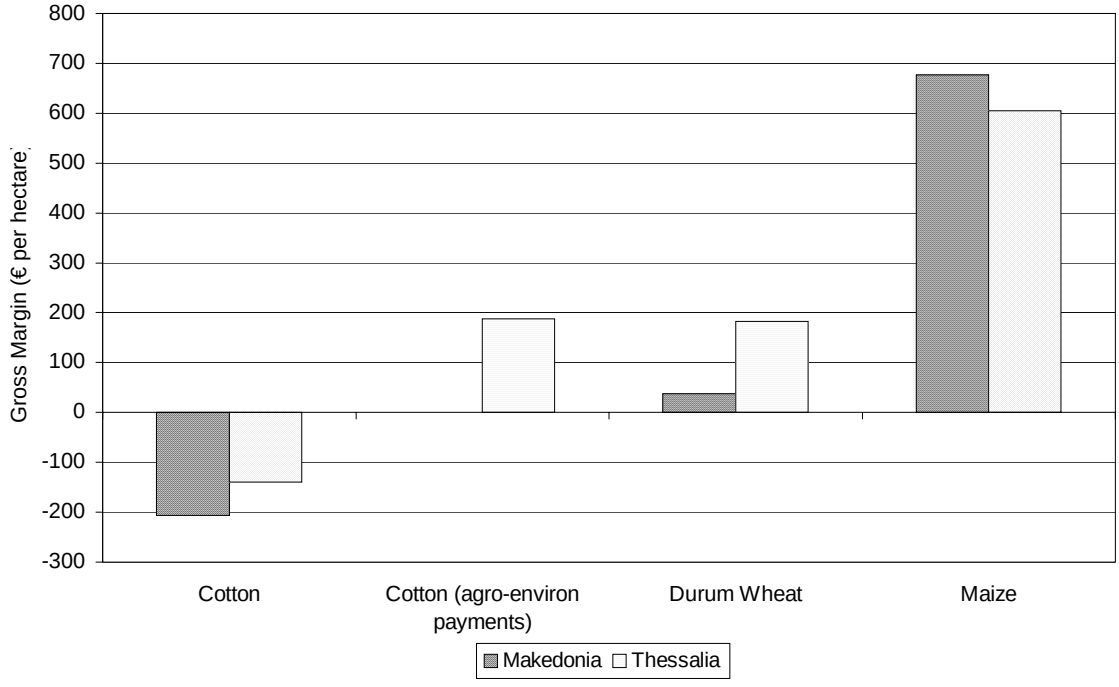
In Greece cotton margins turn negative except where agri-environmental payments are made (Diagram EXEC 8). We would expect the cotton area to fall to the area that receives these payments.

Diagram EXEC 7: Gross Margins with Full Decoupling in Spain



Source: LMC

Diagram EXEC 8: Cotton vis-à-vis Competing Crops, Full Decoupling, Greece



Source: LMC

OBSERVATIONS

With regard to the reform of the regime and options for change, our analysis suggests:

- The outcome of the reform, at least in the short run, has been markedly different in Greece and Spain. In Spain the area under cotton has contracted while in Greece it has been maintained. In the longer term, we would expect to see the

cotton area in Greece fall, in view of the higher gross margins for some competing crops.

- The speed with which farmers switch between crops depends upon the gross margin, which is a function of both prices and costs. Our analysis in based on the prices that faced producers on planting in 2006. Over time, prices change. For instance, a rise in cereal prices relative to cotton (such as occurred in 2006) would push gross margins in favour of cereal production and the cotton area would contract.

- Under a fully decoupled system, the gross margin for cotton is negative in all but one case. Growers would be expected to switch to alternative crops and there would be much less cotton production in Europe.

- Under the current system, gross margins on cotton are highest when agri-environmental payments are received. This is not the intention of the agri-environmental scheme. It suggests that the level at which these payments are set is too high.

- Under the reformed system, the payment of the coupled payment is on boll opening rather than harvest. For some producers in Spain, the optimal production decision is to move to a low input-low output system without harvesting. That this is true points to a sub-optimal incentive structure that does not lead to the maintenance of the ginning industry, which is essential to the long term viability of the industry. A system of coupled payments implies that cotton production is a desired objective, yet the payment on boll opening contradicts this view, as there is no requirement to harvest that cotton.

- There is over-capacity in the ginning sector. This existed prior to the reform, but has been amplified by the reduction in production following the reform, particularly in Spain. In order to ensure the long term viability of the industry, ginning capacity needs to be rationalised.