REPORT

Contribution of live exports to the Australian Wool Industry

Prepared for
Australian Wool Innovation

March 2014

THE CENTRE FOR INTERNATIONAL ECONOMICS
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Contents

BOXES, CHARTS AND TABLES

Abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AWI	Australian Wool Innovation
CIE	Centre for International Economics
CWE	Carcass weight equivalent
ESCAS	Exporter Supply Chain Assurance System
GMI	Global Meat Industries
GVP	Gross value of production
OTH	Over-the-hooks

Summary

There has been significant debate over the contribution of the live export trade for both sheep and cattle over recent years. This debate has been in the context of the potential benefits versus the direct costs of closing the trade.

It has been widely recognised that the export of live sheep underwrites the saleyard price of lambs and sheep nationally, and in particular Western Australia, and so contributes to the red meat industry, however, the contribution of the live trade to the wool industry is not well understood.

- AWI has asked the CIE to estimate the contribution of the live sheep trade to woolgrowers nationally.
- The purpose of this report is to estimate the contribution of live trade directly on the wool industry nationally.

The live trade has a substantial contribution to Australia woolgrowers

In 2011, CIE prepared a comprehensive assessment of the value of the live export industry to the Australian livestock industries and wider economy. The report, prepared for LiveCorp, covered the period 2005-06 to 2008-09. Due to the significant structural changes in the wool and sheep industries, the results of a previous report — prepared by CIE (2011) for LiveCorp covering the period 2005-06 to 2008-09 — required updating.

To prepare this report, CIE updated the results from the previous year — using 2011-12 as the base year for the analysis — to assess the value of live exports to the Australian wool industry. Once updated, gross margin analysis was used to assess the impact of closing live trade on woolgrowers in Western Australia and key regions in the eastern states.

- The impact on woolgrowers was calculated by comparing the market outcomes observed in 2011-12, such as production and prices, with what they would have otherwise been with the closure of live exports.

Table 1 shows that if the live trade were to close, average saleyard prices across Australia would fall by:

- **$4.07** per head or 4.5 per cent for lambs
- **$13.20** per head or 24.4 per cent for older sheep.

That is, prices would have been between $4 and $13 per head *lower* than those observed in 2011-12 across all Australian regions — as a result of closing live exports.

These lower sheep prices impact on woolgrowers by reducing their total receipts and the profitability of wool and sheep relative to other enterprises. As a result of lower prices

woolgrowers in specialist or mixed enterprises are then expected to adjust their production decisions differently.

In addition to lower sheep prices, the closure of live exports is expected to impact on the wool industry in the following ways:

- the national sheep flock would fall by between 3.5 per cent relative to 2011-12 levels representing 2 million head
- the national wool clip falls in line with the national flock by 2.3 per cent or 7.9 million kilograms greasy basis
- the eastern (and western market indicator) *increases* by 1.49 per cent or 17.9 cents per kilogram clean basis as a result of lower wool production Australia-wide.

These impacts combine to reduce the gross value of production of woolgrowers by **1.55 per cent or $39 million**.

- These results reflect the adjustment that would take place in the medium term of between 3 and 5 years.

1 National impacts of closure of the live trade[a]

		Headline analysis
Lamb saleyard prices	%	-4.5
	$ per head	-4.07
	c/kg dw	-19.1
Sheep saleyard prices	%	-24.4
	$ per head	-13.2
	c/kg dw	-62.6
National flock numbers	%	-3.5
	million	-2.05
National wool clip	%	-2.32
	mkg greasy	-7.9
Gross value of production of wool production	%	-1.55
	$ millions	-39
Eastern market indicator	%	1.49
	c/kg clean	17.9

[a] Compared to 2011-12 levels.

Source: GMI model and CIE calculations.

To put these national results in perspective, the expected impact on wool production and gross value of production is relatively small compared to other economic drivers such as variations in the exchange rate and seasonal conditions.

Impacts on Western Australia

However, these impacts are significantly different between different production regions. If live sheep exports were to close, the impact in Western Australia would be devastating, involving falls of:

- $32 per head for lambs or a fall in the saleyard price of **35.1 per cent**
- $36 per head for sheep or a fall in the saleyard price of **66.2 per cent**.

Without live exports to underpin prices, the Western Australian price paid by processors would default to the eastern states (South Australian) price less the transport cost. This transport cost will be most likely in the range of $25 to $30 per head, which until the supply side adjusts further, will be borne by wool and sheep producers.

The implications for WA woolgrowers is dramatically different to these in the eastern states:

- the state sheep flock is likely to **fall** between **10.2** and **15.1 per cent** for specialist and mixed enterprises, equivalent to a decline of **1.8 million sheep**
- production of meat from lamb and older sheep will increase (as a result of diversion from the export trade)
- wool production could **fall by 12 per cent** statewide flowing on from lower enterprise profitability.

As a result of lower prices and production decisions, enterprises revenues in Western Australia fall.

- Overall, we expect that the GVP of WA woolgrowers would be **$302 million or 6.5 per cent lower** each year compared to 2012 terms without the live trade.

How these changes impact on profitability of woolgrowers in Western Australia is difficult to assess due to the shared costs between wool, sheep and other farm enterprises. Instead, a simple gross margin analysis was conducted

- Breeding enterprises will be hit hardest with the gross margin falling by $41 per ewe or 44.8 per cent as a result of its dependence on livestock sales (around 60 per cent of receipts) and the lack of scope to reduce variable costs.
- Wethers for wool production suffer a fall in gross margin of $4 per wether or 21.6 per cent. This is because of the lower reliance of this enterprise on livestock sales (where around 75 per cent of total receipts are from wool) and an offsetting fall in variable costs as a result of lower hogget prices.

- **The bottom line is that WA woolgrowers, and particularly specialist woolgrowers, have limited capacity to transform their enterprise mix away from sheep. This is why the option value of the live trade is so important, in providing another channel to dispose of cull wethers for a good return.**

Eastern states analysis

The analysis also estimated the projected impacts on woolgrowers in eastern states. If the live trade were to close, under the headline analysis, average saleyard prices across the eastern states would fall by:

- $1.24 per head or 1.4 per cent for lambs
- $5.96 per head or 24.4 per cent for older sheep.

This is a smaller result than for Western Australia because of

- the lower contribution of live exports to total sales of sheep (live export plus processing and stores)
- the larger number of marketing options woolgrowers have in the eastern states.

However, the eastern states aggregate comprises of a range of regions that have different exposures to the live trade operating out of Adelaide and Portland, Victoria. To explore these impacts further, we examine the impact of closing the trade for eight regions using a case study approach.

- Consultation with the live trade industry indicated that agents accessed higher quality stock across a number of regions at different times of the year.
- Estimating the impact of closure of live sheep exports at a regional level was a challenge because of the lack of data. Many sheep are staged towards export depots, therefore, woolgrowers are unlikely to know they are selling to live exports.
- Consultation revealed that the current regulatory environment has reduced demand for sheep from Victoria and South Australia and significantly increased costs.

The core of the regional analysis was the potential impacts on the east-coast saleyard prices. The analysis accounted for the key decision variables used by woolgrowers concerning where to sell their sheep if live exports were to close. These variables include:

- transport costs to processors or saleyards and other additional costs including agents commission and fees including discounts that may apply
- relative returns from selling to regional saleyards, major east coast saleyards and direct to processors.

Woolgrowers already access all of these marketing options: however, we estimate that sales to live export depots, directly and indirectly, accounts for between 10 and 30 per cent of total sales of older sheep across the 8 case study regions. Table 2 shows the impact on woolgrowers of closing the live trade at a regional level.

2 Impact of closing the live export trade on farm gate prices and total receipts

Region	Change in mutton price		Change in total receipts	
	$ per head	%	$ per farm	%
South Australia				
North Pastoral	-7.6	-12.7	-18 400	-3.5
Eyre Peninsula	-7.6	-12.2	-7 700	-3.6
Murraylands and Yorke Peninsula	-6.6	-10.0	-6 800	-4.3
South East	-5.6	-7.9	-10 600	-1.9
Victoria				
Central North	-5.6	-7.5	-2 900	-2.1
Wimmera	-5.6	-7.7	-2 400	-1.8
New South Wales				
Far West	-6.0	-9.6	-7 500	-3.3
Riverina	-5.6	-7.5	-4 000	-2.0

Source: ABARES/MLA survey and CIE calculations.

- If the live export trade was closed the farm gate prices of sheep across the case study regions are estimated to fall by between $5.50 and $7.50 per head over the medium-term (that is, 3 to 5 years into the future) compared to 2011-12 levels.
- As expected, those regions with the longest transport distances and fewer market options are impacted the hardest where the farm gate price of sheep is expected to fall by up to 12.7 per cent.
- For woolgrowers within easy transport distance of the key national markets, their farm gate price would fall in line with the national saleyard price of $5.96 per head noting that because of the structure of agents' commission and MLA levy, the farm gate price would fall by $5.60 per head.

These results reflect the fact that *only some* older sheep (between 10 and 30 per cent) need to be diverted from live exports, so requiring additional costs that reduce the farmgate return below that observed in the major east coast saleyards.

Accounting for the different output mixes for each farm type, the modelling indicates cash receipts across all the case study regions will fall by 2.5 per cent or $67.8 million in 2011-12 terms split evenly between specialist producers and mixed enterprises.

The impacts at a regional level on a per head and a per farm basis are consistent with the findings for Western Australia where ewe enterprises are impacted significantly more than for those for wethers. Across case study regions, average gross margins fell by an average of $3 900 per farm, the majority of the loss coming from the ewe enterprise.

- **Live sheep exports also contribute significantly to incomes of eastern states woolgrowers, particularly in the pastoral zones of South Australia and New South Wales, by providing another market option. However, the benefit from this option has been eroded by the introduction of the Exporter Supply Chain Assurance System (ESCAS) by the Australian Government in October 2011.**

1 Introduction

The live export industry generates significant benefits for the Australian farm sector and the wider economy, more broadly. In 2011, the Centre for International Economics (CIE) estimated the contribution of the industry to red meat producers through evaluating the impact of closing the live trade for LiveCorp. However, the live export trade also affects Australian woolgrowers, not only through red meat markets, but also through its impact on the flock size, the composition of the national wool clip and the supply of wool and sheep.

As such, Australian Wool Innovation Limited (AWI) is seeking an assessment of the potential impact of the live sheep trade on the Australian wool industry.

It is widely acknowledged that the without live exports farm gate returns would be lower because of the lower demand for livestock and the higher transport costs involved in transporting animals to alternative markets. Estimating this total impact required an assessment of the next best return for livestock, in absence of live exports: this would be sales to the processing sector and then on to domestic and export meat markets.

The CIE (2011) estimated the contribution of the live export industry by assessing the potential impact of closing the live export trade on prices and quantities across the entire livestock industry. This impact was measured as the differential between farm gate returns and incomes in the live export and processing industries with and without the live trade for the period 2005-06 to 2008-09.

The Global Meat Industries (GMI) model was used to analyse the contribution of live exports of feeder and slaughter cattle and sheep on the Australian red meat industry over the period 2005-06 to 2008-09.

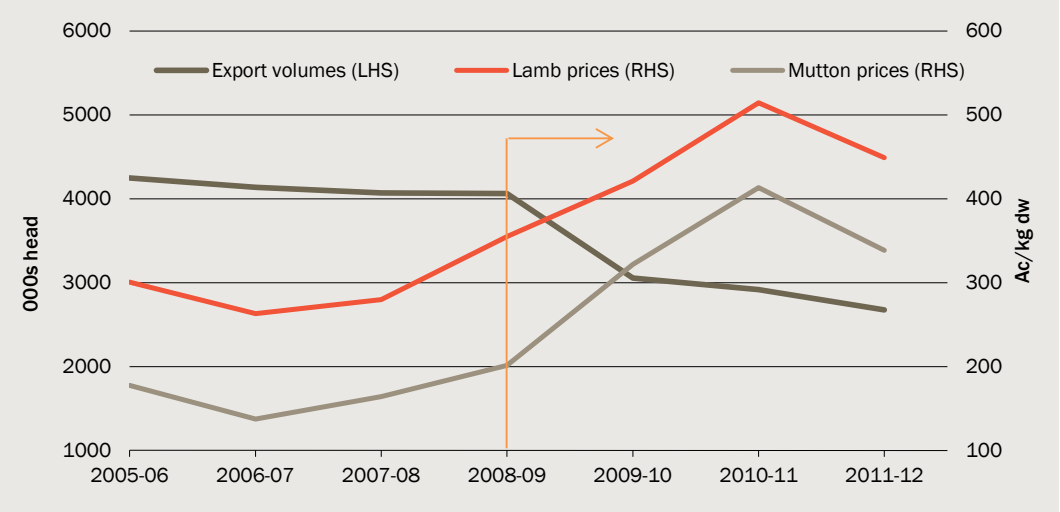
The timeframe used in the LiveCorp report recognised that the size of the live trade in both cattle and sheep had varied over time and measured the value of the contribution using a conservative approach by taking an average over the period 2005-06 to 2008-09. Since this study, there have been important changes in the Australian sheepmeat market.

Since 2008-09, the sheepmeat market in Australia has changed significantly as summarised in chart 1.1. Comparing the period 2009-10 to 2011-12 with 2005-06 to 2008-09:

- live sheep export levels are 30 per cent lower
- lamb prices are more than 50 per cent higher
- older sheep prices are more than 100 per cent higher.

Appendix A identifies some of the significant structural changes that took place in the wool and sheep industries, especially in Western Australia, that necessitated updating the LiveCorp results.

1.1 Sheepmeat market developments since 2005-06



Data source: MLA and GMI database

Updating the impact of closure of the trade

To establish the impact of closing the live export trade on woolgrowers, the first step is to update the contribution of the trade to livestock markets. The key drivers of the original results at a national level included:

- the number of sheep from the live trade that would be diverted back onto the domestic market for processing relative to those numbers already sold for slaughter
- additional costs involved in the transport of sheep from Western Australia interstate for processing
  - In absence of live exports of sheep, prices in Western Australia would be set by the eastern states price plus this transport cost.
- utilisation of processing capacity especially in Western Australia.

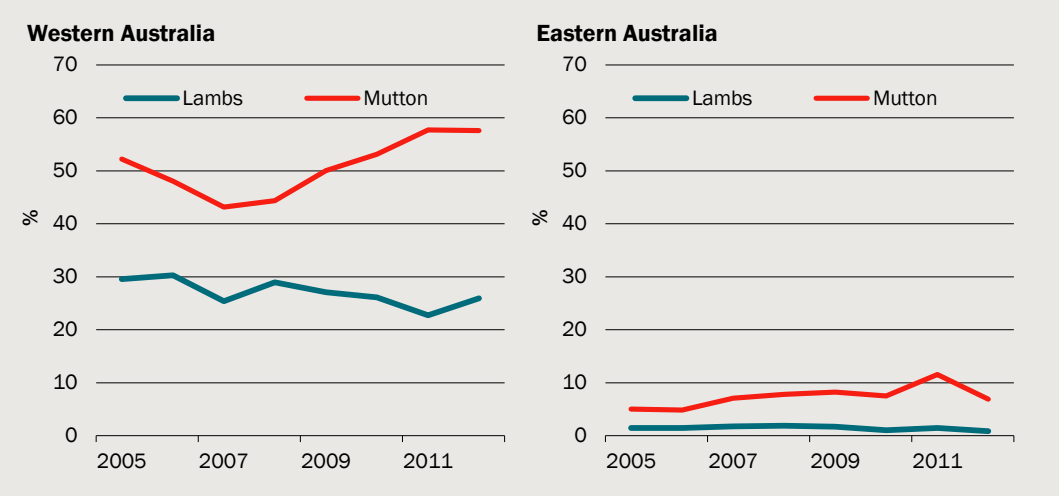
While live sheep export numbers have fallen (chart 1.1), the direct contribution of the trade is significantly different between Western Australia and the eastern states as illustrated in chart 1.2. The left hand panel of chart 1.3 shows the significant contribution of live exports in total disposals of sheep from the system for Western Australia — in terms of thousands of head — including sheep for slaughter and exported live. Live exports account for:

- 25.9 per cent of total disposals of lambs
- 57 per cent for older sheep.

This is much larger than for the eastern states for 2012, where live exports accounted for just 2.2 per cent of total disposals for all sheep including:

- 0.9 per cent of total disposals of lambs
- 6.9 per cent of total disposals for mutton types.

1.2 Contribution of the live exports in total exits of sheep[a]

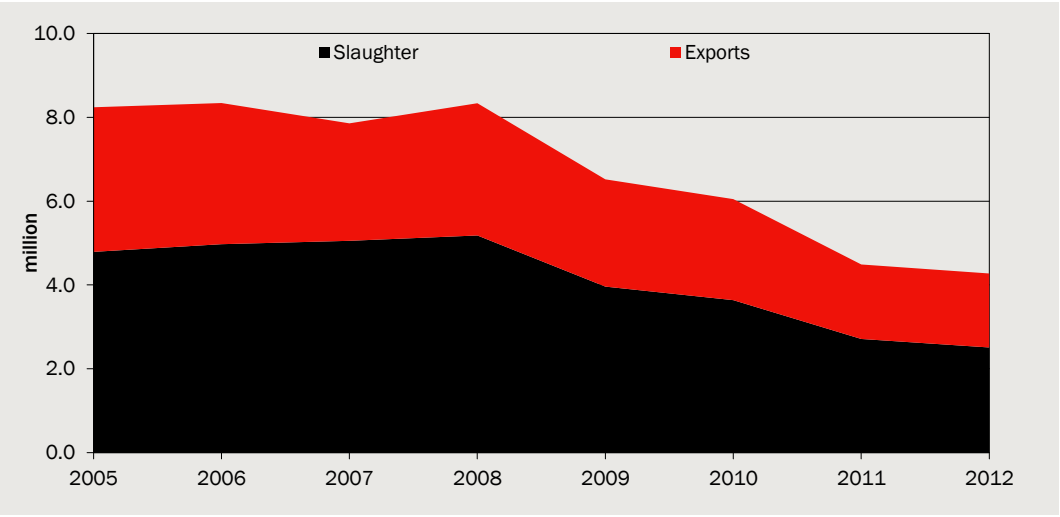


[a] Total exits of lambs and mutton is defined as numbers exported live plus those slaughtered.

Data source: ABS.

Chart 1.3 shows that both slaughter and live export numbers have declined in line with the Western Australian flock size. In fact, live exports as a proportion of total disposals has remained steady at around 40 per cent across lambs and older sheep, since 2005. Therefore, in the first instance, it could be expected that impact of closing the trade could be similar to the previous analysis.

1.3 Total slaughter and live exports in Western Australia



Data source: ABS and LiveCorp.

However, this decline in total sheep numbers has significantly changed the scope for the existing capacity in Western Australia to process sheep diverted from the live trade. Chart 1.3 shows that in 2011, total disposals fell below 6 million head. This was the (conservative) maximum level of processing capacity identified by CIE(2011).

- Prior to 2008-09, average export levels were at nearly 3 million sheep from Western Australia. The previous report calculated that nearly 2 million sheep would have been required to be transported east for processing, should the live trade close.

- Based on 2009 live export levels, Kingwell et all (2011) made an assessment that there was sufficient capacity in the WA processing sector to process sheep diverted from exports due to throughput levels lower than full capacity and the scope for expansion through the addition of shifts. The excess capacity was estimated to be between 1.7 and 1.8 million head per year.
- Sapere (2013) reported more recent estimates of the processing capacity of at least 4.9 million head, but conservatively used a total capacity estimate of 5.9 million. This is similar to that used in the CIE (2011) report. However, at current turnoff levels and investment in the mining sector slowing and making more labour available, sufficient slaughter capacity is unlikely to be an issue going forward.

Closure of the trade will have a profound impact on WA woolgrowers and sheepmeat producers. In absence of the trade and an additional market for sheep, prices for slaughter sheep and for stores will be set by the eastern states (South Australian) price less an appropriate transport margin for transport between South and West Australia.

- The CIE (2011) used a transport cost of $25 per head. Conservatively, with increases in fuel prices and associated costs, this cost could be $30 per head. This is relevant because the only alternative to sales to local processors or for stores is transporting east, which is very expensive.

Revised impact on livestock markets

The national impact of closing the live export trade is shown in table 1.4, where for 2012, sheepmeat production is estimated to increase by 9.7 per cent, if live sheep exports were diverted through domestic processing.

1.4 Revised impact of the live trade for Australia

		2009	2010	2011	2012	Average
Live export numbers						
Lamb	000's	1 143	953	787	731	904
Mutton	000's	2 425	2 015	1 671	1 549	1 915
Total	000's	3 568	2 969	2 458	2 280	2 819
Assumed weights						
Lamb	kg lw	42	42	42	42	42
Mutton	kg lw	52	52	52	52	52
Australia	kg lw	49	49	49	49	48
Increase in meat production						
Lamb	cwe	24	20	17	15	19
Mutton	cwe	63	52	43	40	50
Australia	cwe	87	72	60	56	69
Increase in production						
Lamb	%	5.7	5.0	4.2	3.5	4.6
Mutton	%	31.6	37.7	38.8	30.9	34.7
Total	%	13.9	13.4	11.8	**9.7**	12.2

Source: CIE calculations.

The impact for Western Australia is significantly different as shown in table 1.5, where closure of the trade would increase WA sheepmeat production by 40.4 per cent in 2012 — this potential diversion has fallen in percentage terms since 2010 reflecting the fall in numbers of live sheep exported and the higher proportion of lambs slaughtered during this period.

- Mutton production in 2012 terms would be expected to more than double.

1.5 Revised impact of the live trade for Western Australia

		2009	2010	2011	2012	Average
Live export numbers						
Lamb	000's	827	777	549	570	681
Mutton	000's	1 736	1 632	1 153	1 197	1 429
Total	000's	2 562	2 409	1 703	1 766	2 110
Assumed weights						
Lamb	kg lw	42	42	42	42	42
Mutton	kg lw	52	52	52	52	52
Western Australia	kg lw	49	49	49	49	48
Increase in meat production						
Lamb	cwe	17	16	12	12	14
Mutton	cwe	32	41	30	31	33
Western Australia	cwe	49	58	42	43	48
Increase in production						
Lamb	%	38.5	35.6	29.3	34.0	34.4
Mutton	%	87.4	133.1	161.0	156.2	134.4
Total	%	49.4	55.7	40.4	**40.4**	46.5

Source: CIE calculations.

For the eastern states for 2012, total meat production would be expected to increase by significantly lower quantities than for Western Australia:

- 3 kt cwe for lamb
- 9 kt cwe for mutton.

The aggregate of the eastern states provides a distorted picture of the contribution of the live trade as it is comprised of a large number of geographically dispersed regions — with different exposures to the live trade.

Timeframe for this assessment

The impact on livestock prices are estimated using the GMI model — a national model of livestock demand and supply. The GMI results and the analysis for woolgrowers that follows take a medium term view. This is critical for the farm level supply responses to the price change identified above.

- Immediately following the closure of the trade, we would expect that woolgrowers have little or no scope to adjust turnoff levels and enterprise mix. However, with more time, they can adjust more freely.
- Should the live trade close, the results reported here reflect an ***adjustment period of 3 to 5 years*** from a base of 2011-12 data.

Appendix B discusses the choice of supply elasticities used for the analysis.

Revised impacts on saleyard prices

Table 1.6 summarises the updated impact of closure of the trade for Australia, the eastern states and for Western Australia. At a national level, sheep prices could be expected to fall by between $4.07 and $13.28 per head for lambs and older sheep, with overall GVP across sheep sold for slaughter falling by 10.3 per cent.

- This result is a *weighted average* between Western Australia and the eastern states where woolgrowers in the west account for around 22 per cent of the national flock.
- For Australia as a whole, the model outcome for the GVP for older sheep remains relatively unchanged. This result reflects the coincidence that the value from the increased number of sheep slaughtered is almost exactly offset by the price effect across both regions.

1.6 Impact of closure of the live trade on saleyard prices and sheepmeat GVP

	Saleyard price[a]		Gross value of production
	$ per head	%	%
Australia			
Lambs	**-4.07**	-4.5	-3.5
Sheep	**-13.28**	-24.4	**0.0**
Live sheep	-75	-100.0	-100.0
Total	-8	-9.5	**-10.3**
Eastern States	77		
Lambs	-1.24	-1.4	-1.4
Sheep	-5.96	-11.0	5.6
Live sheep	-75	-100.0	-100.0
Total	-3	-3.9	-2.4
Western Australia			
Lambs	-32.14	-35.1	-26.2
Sheep	-35.99	-66.2	-30.2
Live sheep	-75	-100.0	-100.0
Total	-38	-49.4	-56.5

[a] Return for live sheep at free on board basis adjusted back to saleyard equivalent.

Source: GMI model and CIE calculations.

These results are different from the previous report due to significantly higher prices for all sheep types.

As shown in table 1.5, the majority of the impact will be felt in Western Australia with lamb and older sheep prices falling by over $30 per head as a result of processors pricing off the South Australian prices less transport. This fall impacts particularly on older sheep which have a lower return both on a per kilogram and per head basis.

There will be negative impacts on prices in eastern states, but significantly less than for the west because of the small size of the live exports relative to the rest of the market for sheep.

- **The potential closure of the live export trade is a critical issue for woolgrowers in Western Australia, but less so for the eastern states where there are more marketing options.**

While the detail for lamb, mutton and live sheep is very good, identifying domestic and individual export markets, the representation of woolgrowers is basic. Therefore, to calculate more detailed impacts on woolgrowers, we use the GMI results in concert with a detailed data for sheep industries based on ABARES/MLA survey data in chapter 2.

2 Detailed impacts on woolgrowers

Given the importance of the potential supply response to appraising the impact of cessation of the live trade, an assessment was made of the factors that would contribute to producers' decisions. These factors include the potential costs associated with the transition from live export markets to meat markets including the

- potential reduction in farm gate prices and/or an increase in transportation costs; and
- the viability of alternative enterprises and their associated benefits and costs — which would be a key factor affecting overall supply response.

Given that live exports support sheep prices, especially in Western Australia, a critical parameter is the responsiveness of wool and sheep enterprises to a change in the price of lamb and older sheep or the supply elasticity. The supply elasticity is defined as the percentage change in the size of the flock (including ewe and wether flocks) expected as the result of a change (1 per cent) in the price of slaughter sheep and wool.

There are a number of potential sources of this information including previous studies and judgements informed by recent market developments (see appendix B for details). The headline results use a supply elasticity of 0.4 for specialist producers and 0.6 for mixed enterprises and accounting for the different output mixes for specialist and mixed enterprise types.

Impact on Western Australian woolgrowers

The overall impact on woolgrowers in Western Australia is shown in table 2.1.

The modelling indicates that the state flock is likely to fall between 10.2 and 15.1 per cent across farm types (see red text in table 2.1).

- This is equivalent to a fall of 1.8 million sheep statewide off the 2012 base of 14 million head.
- This fall would be expected to take place over a 3 to 5 year period following closure of the trade.

While sales of lamb and older sheep to processing increases (because of diversion from the export trade), these increases are offset by a fall in total flock numbers.

- Wool production could fall by 12 per cent state-wide. This is a result of a switch away from all sheep enterprises. As a result of price falls and production decisions, enterprise revenues fall strongly.
- Overall, we expect that the GVP of WA woolgrowers would be $302.4 million or 6.5 per cent lower each year compared to 2012 terms, without the live trade.

2.1 Impacts on total receipts of Western Australian woolgrowers[a]

		Specialist	Mixed	All woolgrowers
State flock	%	**-10.2**	**-15.1**	-12.8
	Million	-0.7	-1.1	**-1.8**
Production				
Lamb	%	12.5	12.1	12.3
Sheep	%	64.4	179.0	106.1
Wool	%	-9.7	-14.2	**-12.0**
Enterprise revenues				
Lamb	%	-27.0	-27.3	-27.1
Sheep	%	-44.4	-5.7	-30.4
Wool	%	-9.0	-13.5	-11.3
Lamb	$m	-19.9	-23.8	-43.7
Sheep	$m	-25.1	-1.8	-26.9
Live exports	$m	-69.8	-109.4	-179.2
Wool	$m	-20.2	-32.4	-52.6
Enterprise receipts[b]	$m	-134.9	-167.5	**-302.4**
	%	**-6.6**	-6.4	**-6.5**

[a] Compared to 2011-12 levels. [b] Includes receipts from sheep and wool sales and other livestock and cropping.

Source: GMI model and CIE calculations.

- This change would reduce GVP of specialist enterprises by 6.6 per cent because of their dependence on sheep-related incomes and lack of scope to move to other enterprises.
- For mixed enterprises, this adjustment is larger in dollar terms because of their larger flock size and revenue-base across the state.

Kingwell et al (2011) examine the regional contribution of live sheep exports for Western Australia especially in regard to the greater regulation of the trade (contrasting with closure of the trade examined in this report). Overall, the statewide results of both studies are consistent but Kingwell et al (2011) examines in greater detail the implications for sheep producers at a regional level.

Impact on eastern Australian woolgrowers

Table 2.2 shows the projected impacts on woolgrowers in eastern states over a 3 to 5 year period. Because of their significantly lower exposure of the live trade and the relative size of sheepmeat processing and exports, the impact is significantly less than for Western Australia. However, the eastern states aggregate comprises of a range of regions that have different exposures to the live trade. To explore these impacts further, we examine the impact of closing the trade for selected regions using a case study approach in chapter 3.

2.2 Impacts on total receipts of eastern states woolgrowers[a]

		Specialist	Mixed	All woolgrowers
State flock	%	-0.4	-0.6	-0.4
	Million	-0.1	-0.1	-0.3
Production				
Lamb	%	0.3	-0.2	0.1
Sheep	%	5.6	6.5	5.8
Wool	%	-0.1	-0.1	-0.1
Enterprise revenues				
Lamb	%	-1.1	-1.5	-1.3
Sheep	%	-6.0	-5.2	-5.8
Wool	%	0.7	0.7	0.7
Lamb	$m	-8.8	-7.0	-15.9
Sheep	$m	-9.2	-2.6	-11.7
Live exports	$m	-36.7	-14.9	-51.6
Wool	$m	10.0	4.0	14.0
Enterprise receipts	$m	-44.7	-20.5	-65.2
	%	-1.3	-0.3	-0.6

[a] Compared to 2011-12 levels.

Source: GMI model and CIE calculations.

Sensitivity analysis

The supply responsiveness of sheep enterprises with respect to average returns has been identified as a key variable for this analysis. The elasticities used in the headline analysis are significantly lower than those from the literature (see appendix B).

To address this issue, we have doubled the size of the supply elasticities used in the headline analysis to make them more consistent with those estimates from the literature (and the experience through the 1980s and 1990s).

- That is, a supply elasticity of 0.8 for specialist producers and 1.2 for mixed enterprises.

The bottom line in table 2.3 is that the results are roughly double those in table 2.1, with the WA flock falling by 3.4 million. Overall, because of the greater adjustment away from sheep enterprises, total receipts fall by $375.6 million or a fall of 8.1 per cent from 2011-12 levels.

The other critical variable is the transport cost from Western Australia to South Australia. The size of the overall results vary with this cost, but there was no scope to test this number with people in the industry or indeed understand how many sheep are already transported east.

2.3 Sensitivity analysis for Western Australia[a]

		Specialist	Mixed	State
State flock	%	-19.9	-28.6	-24.4
	million	-1.3	-2.1	**-3.4**
Production				
Lamb	%	0.9	-2.1	-0.8
Sheep	%	47.4	136.6	79.8
Wool	%	-19.1	-27.4	-23.4
Enterprise revenues				
Lamb	%	-34.1	-36.0	-35.1
Sheep	%	-51.8	-22.6	-41.2
Wool	%	-17.9	-26.3	-22.2
Lamb	$m	-25.1	-31.4	-56.5
Sheep	$m	-29.2	-7.3	-36.5
Live exports	$m	-69.8	-109.4	-179.2
Wool	$m	-40.1	-63.2	-103.3
Enterprise receipts	$m	-164.3	-211.3	**-375.6**
	%	-8.1	-8.1	**-8.1**

[a] Compared to 2011-12 levels.

Source: GMI model and CIE calculations.

Table 2.4 shows the equivalent analysis for the eastern states, where the impact of the closure of the trade remains small.

- For woolgrowers, and in particular for specialist producers, the contribution of livestock sales to overall enterprise receipts is less than 40 per cent, and from this base saleyard price are not falling significantly (compared to Western Australia).
- Total enterprise receipts are projected to fall marginally over a 3 to 5 year period.

2.4 Sensitivity analysis for the eastern states[a]

[a]Enterprise		Specialist	Mixed	State
State flock	%	-0.2	-0.3	-0.2
	million	-0.1	0.0	-0.1
Production				
Lamb	%	0.3	0.0	0.2
Sheep	%	5.7	6.7	5.9
Wool	%	0.0	0.1	0.1
Enterprise revenues				
Lamb	%	-0.6	-0.9	-0.7
Sheep	%	-7.1	-6.1	-6.9
Wool	%	1.5	1.6	1.5
Lamb	$m	-4.6	-4.2	-8.7

[a]Enterprise		Specialist	Mixed	State
Sheep	$m	-10.8	-3.1	-13.8
Live exports	$m	-36.7	-14.9	-51.6
Wool	$m	21.6	9.4	31.0
Enterprise receipts	$m	-30.4	-12.7	-43.1
	%	-0.9	-0.2	-0.4

[a] Compared to 2011-12 levels.

Source: GMI model and CIE calculations.

National results

Table 2.5 adds up the analysis across Western Australia and the eastern states to a national level, reporting against key variables identified in the terms of reference.

2.5 National impacts on woolgrowers of closure of the live trade[a]

		Headline analysis	Sensitivity analysis
Lamb saleyard prices	%	**-4.5**	-3.6
	$ per head	**-4.07**	-3.30
	c/kg dw	-19.1	-15.5
Sheep saleyard prices	%	**-24.44**	-23.97
		-13.28	-13.03
	c/kg dw	-62.6	-61.4
National flock numbers	%	-3.46	-6.03
	million	-2.05	-3.56
National wool clip	%	-2.32	-2.35
	mkg greasy	-7.9	-8.0
Gross value of production of wool production	%	-1.55	-2.91
	$ millions	-39	-72
Eastern market indicator	%	1.49	0.79
	c/kg clean	17.9	9.5

[a] Compared to 2011-12 levels.

Source: GMI model and CIE calculations.

For woolgrowers at a national level, the closure of the live trade would have a relatively small impact relative to other economic drivers, such as fluctuations in the exchange rate and in weather conditions, for the key variables identified in table 2.5. However, this analysis clearly shows that live exports underwrite sheep prices in Western Australia and as such should be a focus for the woolgrowers of that state.

- Another variable of interest in the terms of reference was wool production by micron band. The analysis presented above shows that any adjustment in the composition of the wool clip by micron will be the result of falls in wool production in Western Australia and most likely in mixed enterprises.

- Given that the WA state average is 20 micron, the quantification of this impact would depends on the production profile of the WA wool clip by micron across enterprise types.
- The impact for the same variable for all eastern states woolgrowers, on average, is expected to be minimal.

Impact on the profitability of woolgrowers

Table 2.1 showed that if live export were to close, wool production in Western Australia could fall by 12 per cent. A more in-depth analysis would recognise that, in addition to prices received, some enterprise operating cash costs would also change. There are typically two enterprise types for woolgrowers:

- merino ewes (breeders) where sales of lambs, hoggets and culls account for around 60 per cent of total receipts (with wool accounting for the remainder)
- merino wether flock where culls account for around 25 per cent of total receipts (with wool accounting for 75 per cent).

For this exercise, detailed gross margin enterprise data for New South Wales was found to be adequate to represent WA woolgrowers (after suitable checking and modification of wool yields, live weights and farm gate prices).

Table 2.6 shows the potential impact of closing the trade on the profitability of WA woolgrowers:

- breeding enterprises will be hit hardest with the gross margin falling by $41 per ewe (difference between $91 and $50 per ewe) or 44.8 per cent as a result of its dependence on livestock sales and the lack of scope to reduce variable costs
- wethers for wool production suffer a fall in profitability of $6 per wether (difference between $27 and $21 per wether) or 21.6 per cent.

The impact for wether enterprises is lower than for breeding because of three contributing factors:

- the lower reliance of this enterprise on livestock sales compared to a ewe operation
- an increase in the price of wool which offsets the fall in livestock revenues
- an offsetting fall in variable costs as a result of lower hogget prices.

These results support the findings by Kingwell et at (2011) who take a more detailed approach to assessing on-farm and regional impacts of increasing regulation of the trade that was expected to increase costs of supplying the trade and reduce demand for live exports. Some key findings of this report at farm level were that:

- WA farmers that currently focus mostly on shipping wether production may not be disadvantaged by a reduction in or cessation of the live sheep export trade, if they transition into lamb production. However, there are a number of sound reasons, apart from currently high wool prices, why broadacre farmers (particularly crop specialists) remain in wether production and so will be disadvantaged to any reduction in the export trade.

2.6 Impact on profitability of wool enterprises in Western Australia

	Baseline	Without live exports	Change
	$	$	%
1000 Merino Ewes - 20 Micron			
Livestock receipts	85 589	42 350	-50.5
Wool receipts	61 915	62 404	0.8
Total receipts	147 505	104 755	-29.0
Variable costs	56 829	54 677	-3.8
Gross margin	90 675	50 078	-44.8
- per ewe	**91**	**50**	**-44.8**
1000 Merino Wethers - 20 Micron			
Livestock receipts	17 892	6 083	-66.0
Wool receipts	51 066	51 470	0.8
Total receipts	68 958	57 553	-16.5
Variable costs	42 403	36 725	-13.4
Gross margin	26 555	20 828	-21.6
- per wether	**27**	**21**	**-21.6**

Source: CIE.

Kingwell (2011) identifies economic drivers why woolgrowers would find it difficult to move away from wether enterprises to include:

- seasonal variation that exacerbate management problems in ewe flocks that focus on lamb production
- managerial time and skill required to generate the superior profits from lamb production is a constraint for crop dominant farmers
- increased price certainty for lambs when delivered to processors and assessed against specification requirements.

- **The bottom line is that woolgrowers, and particularly specialist woolgrowers, have limited capacity to transform their enterprise mix away from sheep. This is why the option value of the live trade is so important, in providing another channel to dispose of cull wethers for a good return.**

This analysis therefore suggests that the majority of the 12 per cent fall in WA wool production would come about through adjustment in ewe enterprises as a result in lower profitability. This in turn would suggest that this fall would be predominantly in wool types greater than the 20 micron average for Western Australia.

A parallel gross margin analysis was not conducted for the eastern states as a whole because of the relatively small magnitude of the adjustments that result from closure of the live trade. However, this approach is used in the case study regions examined in the next chapter.

3 Regional case studies

This chapter examines the impact of a closure to the live export trade on the profitability of regional woolgrowers in New South Wales, Victoria and South Australia.

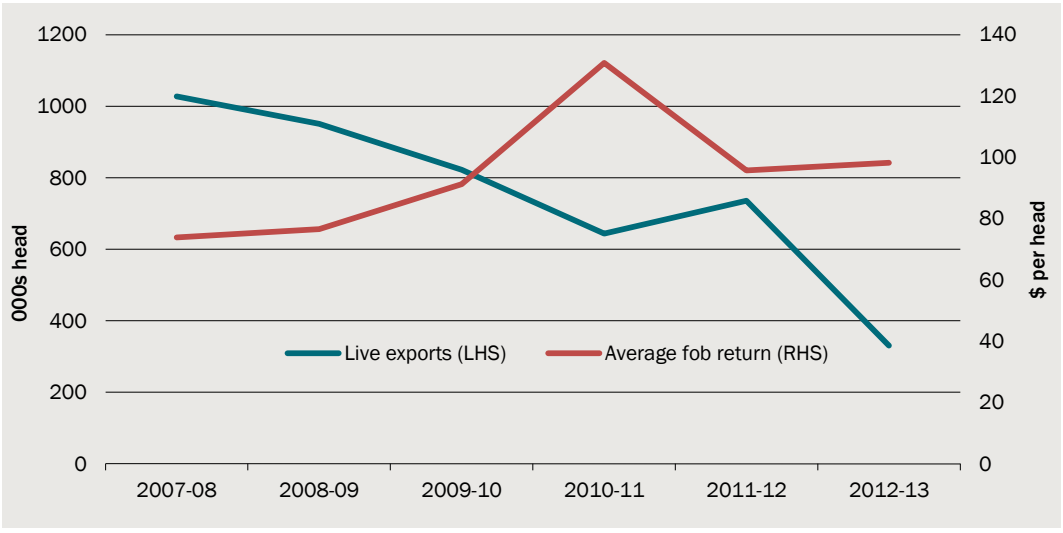
Quantifying the impact of closing the trade was technically straightforward for WA woolgrowers because that state is isolated from the east coast and its production regions are relatively homogenous. The analysis for regional woolgrowers in eastern states is complicated, however, by the fact that they have many more market options. In addition, while the impact of live exports is highly visible in Western Australia each time a ship docks at Fremantle, the impact of the trade in South Australia and Victoria is less obvious.

Characteristics of east coast export trade

There is a strong linkage between the live export trade and woolgrowers through the purchase of merino wethers for export out of South Australia and western Victoria. Chart 3.1 shows that since 2007-08, live sheep exported through Adelaide and Portland have fallen from over 1 million head to 331 thousand in 2012-13, while average fob prices strengthened. This total export is comprised of different lines of sheep:

- merino or merino cross wethers and lambs
- speciality lines including damara or fat tail sheep.

3.1 Live sheep exports volumes and returns



Data source: LiveCorp.

Under the regulatory framework, stock for export must be fit for transport. Agents buying for export source disease free stock in good to heavy condition. Discussions with agents indicate that around 15 per cent of exports through these ports are heavy lambs with the balance being made up of merino wethers and irregular numbers of the speciality lines.

The WA market is characterised by an increasing number of sheep for export being sourced from a dedicated supply chain. This is generally not the case for South Australia and Victoria.

- In the case of heavy lambs, agents buy the best quality stock from the property of birth, as close as possible to the port to minimise transport and stress.
- In the case of speciality lines, especially damaras, sheep are bought direct from property of birth in the pastoral zone (Northern Pastoral and Far West NSW).
- For merino wethers, agents buy also out of the paddock but these properties are unlikely to be property of birth.
- While agents for the export trade choose the best stock, farmers generally sell the remainder into saleyards or transport them directly to processors for sale over-the-hooks (OTH).

Regions accessed to buy merino wethers range from the Eyre Peninsula through to the Riverina and Goulburn districts and even Tasmania. A common feature is that woolgrowers will rarely be aware that they are selling to the trade. Sheep are often purchased by traders or agents and staged towards the exit ports, possibly being backgrounded and shorn before transport to the export depot.

- This is a key reason why the ABARES/MLA survey data reports very few sales for live export. The respondents simply do not know where their sheep will be consigned.
- This gap in the data provides a challenge for this study where we rely on anecdotal information on which regions sheep are purchased from woolgrowers.

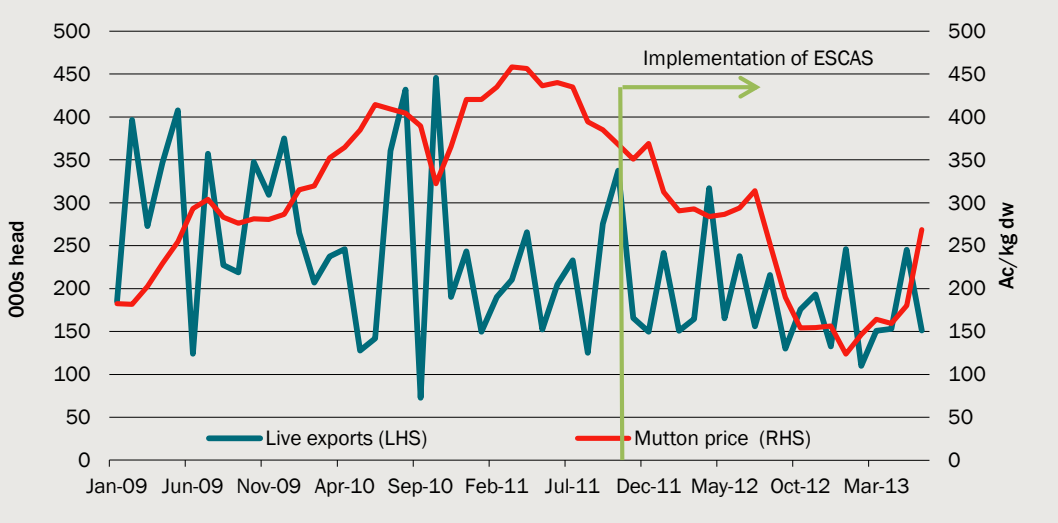
The significance of live export has varied over time in response to key market drivers. Most recently, a significant development was the introduction of the Exporter Supply Chain Assurance System (ESCAS) by the Australian Government in October 2011. Consultation revealed that this development has impacted on the east coast exports more than for the west:

- compliance with Australian Government regulations have proved onerous for key Middle East markets.
  - Effectively, Saudi Arabia has dropped out of the market, which directly impacted the suppliers of the dedicated supply chain for damaras.
- more generally, ESCAS has raised the costs for both agents and exporters at most points of the supply chain.
  - There are now restrictions on the window during which sheep can be exported (which is between March and November). This is typically when sheep become available for the trade after shearing.

Therefore, it is reasonable to conclude that the implementation of ESCAS has contributed to the falling export numbers, especially for South Australia and Victoria.

The estimated cost of bringing a boat around from Fremantle of around $15 per head and the additional compliance costs, means it is simply less cost-effective to source sheep through Adelaide and Portland. Chart 3.2 shows that the implementation of ESCAS has coincided with a fall in mutton prices nationally and a slowing in demand for mutton exports more generally. In fact, the surge in export numbers just before the implementation of the ESCAS indicates higher activity before the higher cost regime came into place.

3.2 Impact of ESCAS on the east coast live export trade



Data source: LiveCorp.

Characteristics of case study regions

Following consultation with industry, we have identified 8 regions across 3 states that are strongly linked to the live export trade and woolgrowers. These are based on regions identified in ABARES/MLA survey identified in table 3.3. Overall, the case study regions account for nearly 11 000 farms carrying 12.8 million ewes and 1.8 million wethers.

The North Pastoral Region in South Australia and Far West NSW both sit within the pastoral zone and share similar characteristics (table 3.3). Both regions have a relatively high share of specialist producers as a result of the lack of cropping options. For these regions and the other case-study regions, as already noted, it was difficult to assess the share of receipts contributed by the live export trade.

Consultation with live export agents suggests that a large number of merino wethers are sold to the trade from this region, particularly after shearing in December and January. These animals are staged down to the ports during which time they are fed-on for up to a year, shorn and sold into the live export depot.

The relatively high share of specialist sheep farms in these regions suggests that woolgrowers may have less scope to adjust their production levels in the event of closure to the live export trade.

3.3 Characteristics of woolgrowers in case study regions for 2011-12

		Farms with sheep		Flock composition	
Broadacre region	**ABARES region**	**All farms**	**Specialists**	**Ewes joined**	**Wethers**
		no	%	000s	000s
South Australia					
North Pastoral	411	291	80.8	847	89
Eyre Peninsula	421	846	44.9	722	221
Murraylands and Yorke Peninsula	422	1 900	39.5	1 501	78
South East	431	1 863	51.0	2 325	316
Victoria					
Central North	223	1 361	56.5	1 090	370
Wimmera	222	1 314	34.6	1 135	204
New South Wales					
Far West	111	739	59.3	1 485	226
Riverina	123	2 624	39.7	3 773	307

Source: ABARE/MLA survey and CIE calculations

Table 3.3 also shows that regions from the wheat-zone are also identified due to the size of their ewe and wether flocks particularly Eyre and Yorke Peninsula in South Australia and the Wimmera in Victoria.

- Data on the number of farms in South Australia indicate that there has been some consolidation in the number of farms and increasing farm size in the Eyre Peninsula and especially in the Murraylands and Yorke Peninsula region, which carries a large proportion of the ewe flock.
- This contrasts to the higher rainfall South East region where the number of farms have been relatively steady but there is a higher reliance on breeding and production of slaughter lambs.

While being located some distance from Adelaide and Portland but adjacent to the significant markets at Wagga Wagga, Bendigo and Ballarat, the Central North and Riverina regions are also key source for the live export trade also around December and January.

Table 3.4 shows the relative contribution of wool and sheep to the total receipts of woolgrowers in each of the case study regions and how these contributions vary between specialist and mixed enterprises.

For the regions in the pastoral zone, specialist producers rely on receipts from wool and the sales of older sheep. As expected, the climate of these two regions are fairly similar with hot and dry summers and mild, dry winters. Rainfall in these areas is low and variable — as a result they have few cropping options. For specialist woolgrowers in the Northern Pastoral region, wool comprises 45.1 per cent of total farm receipts while sales of older sheep represent 61.4 per cent of livestock receipts (see table 3.4).

3.4 Contribution of livestock products to receipts of woolgrowers

	Contribution to farm receipts				Sheep in livestock receipts
	Lamb	Sheep	Wool	Cropping and other	
	%	%	%	%	%
Specialist enterprises					
South Australia					
North Pastoral	12.6	20.1	**45.1**	22.3	**61.4**
Eyre Peninsula	27.2	32.8	27.3	12.7	54.7
Murraylands and Yorke Peninsula	19.3	30.6	24.0	26.0	61.3
South East	34.4	11.5	29.1	25.0	25.1
Victoria					
Central North	36.8	13.7	24.4	25.1	27.2
Wimmera	31.3	10.9	30.0	27.8	25.8
New South Wales					
Far West	25.7	18.8	32.7	22.9	42.3
Riverina	26.7	15.6	25.5	32.2	36.9
Mixed enterprises					
South Australia					
North Pastoral	13.3	4.4	8.2	74.1	25.1
Eyre Peninsula	6.0	3.0	8.4	82.5	33.6
Murraylands and Yorke Peninsula	9.3	2.3	5.2	83.2	19.7
South East	16.2	4.4	11.7	67.7	21.4
Victoria					
Central North	9.3	2.7	6.6	81.4	22.7
Wimmera	8.8	2.3	5.5	83.4	20.6
New South Wales					
Far West	14.9	9.5	9.6	66.1	38.9
Riverina	10.7	2.2	7.5	79.5	17.2

Source: ABARES/MLA survey and CIE calculations.

The Eyre and Yorke Peninsula both have a similar share of specialist sheep farms and derive a similar share of income from wool sales (around 25 per cent of total receipts). The South East has a relatively high share of speciality sheep farms and in turn derives a greater proportion of their income from wool, sheep and lamb. Consultation with live export agents suggests that sheep are typically sourced from these regions around August and September.

The two Victorian case study regions that lie within the wheat-sheep zone are Central North Victoria and the Wimmera. Both regions have a relatively low share of income sourced from sheep and wool compared to the other case study regions reflecting the higher rainfall and greater scope for grain. Consultation with live export agents suggests

that sheep from these regions are typically lambs and sold to the trade around November each year. The relatively low share of speciality sheep farms in the region suggests that woolgrowers may have a greater scope to adjust in absence of the live export trade.

The two regions with the lowest percentage of contribution of sheep, lamb and wool to revenue are the Mallee and SA Eyre Peninsula. These two regions also have similar climatic conditions that make their land use similar. Producers in these regions are more likely to be mixed enterprises, which explains the relatively lower contribution of sales of sheep, lamb and wool to overall revenue.

Key factors in assessing the impact

In the absence of supplying sheep to the live trade, the market options facing woolgrowers depend critically on the size and location of saleyards and processors and the cost of transporting sheep for sale.

Transport costs are critical to this impact

Closure of the live export trade will require some woolgrowers to redirect some of their sheep back to domestic markets (that is, saleyards and/or processors). This may be associated with a change in transportation costs and fees and charges, both of which will impact the final farm gate price and then farm profitability. In order to assess the potential changes in transport costs we developed a matrix of transport costs between the major wool growing regions and primary markets.

A key assumption in this analysis is that across the saleyards of Ballarat, Bendigo, or Wagga Wagga there is sufficient size of yardings and depth of sales across major sheep lines to set the east coast or reference price for most other saleyards after adjustment for transport.

- This was verified by cross checking MLA saleyard prices between regions. For example, average mutton prices in South Australia were consistently lower than for Victoria, accounting for quality.
- When sold into saleyards, in absence of the live trade, sheep can end up being purchased by processors or restockers. In the case of sheep used as restockers, assessing the level of demand is very difficult as it depends on price and availability of feed.
- Woolgrowers can sell into these markets and be assured they are getting the 'east coast' price and so represents the benchmark for their decision making.

For each case study region, table 3.5 compares the cost of transporting sheep (on a per head basis) to the nearest domestic saleyard, processing plant, and port. A number of assumptions underpin the table:

- the cost of transporting sheep is $1.2 per head per 100km (based on consultation with industry specialists)
- sheep can be transported to alternative markets:
  - live export depots at outside Adelaide and at Portland

3.5 Indicative transport costs for each region

Region	Nearest processor	Nearest saleyard	Nearest port
	$ per head	$ per head	$ per head
South Australia			
North Pastoral	11.1	9.4	10.1
Eyre Peninsula	8.2	6.5	7.2
Murraylands and Yorke Peninsula	2.3	2.3	2.4
South East	1.3	4.7	3.1
Victoria			
Central North	3.0	1.1	5.3
Wimmera	1.6	2.4	3.3
New South Wales			
Far West	6.7	5.9	6.2
Riverina	4.9	0.2	9.6

Source: CIE and industry estimates.

  - saleyards in Dublin (South Australian Livestock Exchange), Hamilton, or to nationally significant saleyards at Ballarat, Bendigo, or Wagga Wagga
  - processors in either Murray Bridge (Thomas Foods International), or Bordertown (Tatiara Meats), Warrnambool (Midfields), Ararat (Ararat Meat Exports), Cranbourne (Wagstaff's and Dubbo (Fletcher's).
- a central location within each region was selected as a starting point.

Woolgrowers in North Pastoral, Far West and the Eyre Peninsula face the highest transport charges while those in the Victorian Central North and the Riverina have the lowest as a result of their proximity to major saleyards.

- In Far West New South Wales and the Riverina regions, saleyards at Wagga Wagga and Dublin (the South Australian Livestock exchange) are the closet primary markets.
- In the South Australian regions of North Pastoral, Eyre Peninsula, and the Murraylands and Yorke Peninsula, the closest primary market will typically be the South Australian Livestock Exchange, with Thomas Foods International at Murray Bridge the next closest.

Slaughter capacity is also important

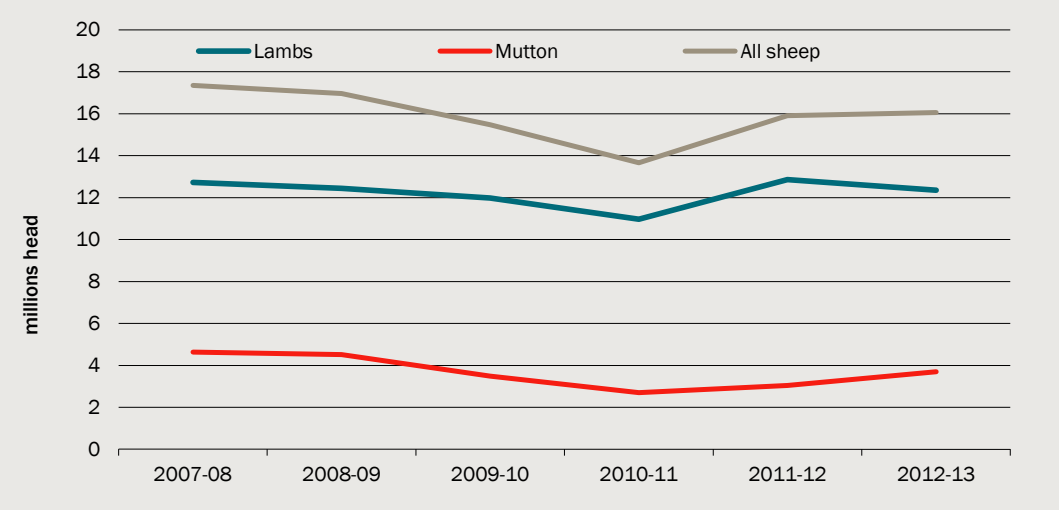
Selling direct to processors is another market option for woolgrowers looking to redirect sheep to the domestic market. Processors, however, only have limited capacity at any one point in time and may not be in a position to absorb additional sheep numbers. This is more critical for South Australia than for Victoria and New South Wales due to the number and size of processors. OTH prices are strongly correlated to those in saleyards because processors set grid prices using saleyard benchmarks and 'top-up' out of saleyards to fill out production runs.

Important context for this assessment is the level and timing of the lamb slaughter. Consultations indicate that on average, lambs are slaughtered from September onwards with processors 'topping-up' plant capacity runs with older sheep.

Chart 3.6 shows that slaughter numbers in South Australia and Victoria declined by around 7 per cent or 1.2 million head between 2007-08 and 2012-13 which indicating some degree of capacity in the processing sector.

- For South Australia, mutton represents between 18 and 25 per cent of total slaughter numbers.
- Across all Victorian processors, mutton accounts for between 19 and 27 per cent of the total kill.

3.6 Lambs and sheep slaughtered in South Australia and Victoria.



Data source: ABS.

If we assume that the slaughter level for each state in 2007-08 is a reasonable approximation for the maximum level of processing capacity, then Victoria alone would have had sufficient processing capacity to process all sheep diverted back to the eastern states in 2012. As a result, it is unlikely that processing capacity would be a significant factor affecting the market options available to regional woolgrowers.

Discounts applying to diverted stock

Industry experts were consulted regarding any discounts that may apply to stock diverted back onto the domestic market. If sheep diverted back to the domestic market attract a discount, then this would be added to additional transport costs to calculate the impact on farm gate returns.

Agents reported that Merino sheep originally destined for exported typically do not attract discounts when redirected back to the domestic market as they are higher quality animals. However, consultations with agents identified that there would be a flow-on impact onto lower quality type such as light wethers or breeders as they are displaced in the market. That is, while merino types that are typically exported live will not be

discounted by processors, their diversion through processing will lead to lower demand, and prices paid, for lower quality sheep used for mutton.

The case of damaras is very different, the domestic market at this point appears to be unable to accept these sheep with processors reporting that they are difficult to handle, do not fit into existing production runs and there is a problem with contamination of carcasses with hair. This has resulted in significant discounts (up to 50 per cent) being applied for these animals and in absence of the Saudi Arabia market has ultimately resulted in a fall in production of these sheep.

- This is not expected to impact on the vast majority of woolgrowers who would not keep damaras as they contaminate merino fleeces at shearing.
- The majority of farms producing damaras have either left the industry or converted back to merinos or goats.

Value chain approach used

In assessing how woolgrowers in each region would change their sales strategy in the absence of the live export option, we recognised that each of the alternative marketing options were associated with different transport and marketing costs. We developed a value chain approach accounting for the applicable costs for transporting sheep to the:

- closest live export depot
- closest processor on a OTH basis
- closet regional saleyard
- major saleyards that set the east coast price.

In addition to transport costs which primarily depend on distance:

- selling direct to live export depots and processors OTH involved payment of the MLA levies only
- selling to saleyards involve costs including the MLA levy, an agents commission of 5 per cent and applicable saleyard fees.

Assessment of exposure to the live trade

Another important factor to recognise is that woolgrowers do not sell all their sheep to the live trade. As identified, the agents choose the best types of transport to the live export depot for those lines — at equivalent prices to saleyards — and the rest of the sheep sold off the property to either saleyards or OTH.

Therefore, we also need information concerning the exposure of each of the regions to the live trade — as noted, there is no data available from the farm survey. Our approach was to combine anecdotal evidence from agents and sales of sheep from the survey, constrained by numbers of sheep known to be exported through Adelaide and Portland.

- In 2011-12, 735 thousand sheep were exported from Adelaide and Portland, which fell to 330 thousand in 2012-13.

- As indicated earlier, these sheep can also be sourced from regions outside of those used in the case studies, but advice from industry indicates that these numbers are likely to be small.
- Another significant issue is that there is a delay of up to one year between sheep being sold out of woolgrowers properties and being exported.

Table 3.7 shows the assessment of sheep that were sold from each case study region for eventual live export in 2011-12. The estimates that are a significant part of our calculations and imply that 576 000 sheep were sold from each of the regions in 2011-12. These were comprised of:

- 60 per cent from South Australia
- 10 per cent from Victoria
- 30 per cent from NSW.

3.7 Importance of the export trade to each case study region for 2011-12

Region	Adult sheep sold	Live export exposure
	000s	%
South Australia		
North Pastoral	263	30
Eyre Peninsula	199	30
Murraylands and Yorke Peninsula	645	20
South East	638	10
Victoria		
Central North	326	10
Wimmera	254	10
New South Wales		
Far West	389	30
Riverina	700	10

Source: ABARES/MLA survey and CIE estimates.

Impact of closing live exports on woolgrowers in case study regions

A case study approach was adopted based on the eight regions listed in table 3.8. The analysis builds on the national results presented in chapter 2 that indicated that if the live export trade were to close—that the indicator prices in the *eastern states* would fall by $1.24 per head for lambs and $5.96 per head for sheep from 2011-12 levels. In addition, modelling at the national level indicates that woolgrowers in the eastern states could also expect a small offsetting increase in the price of wool (as a result of WA wool production falling).

Similar to the analysis for Western Australia, we take a medium term view. This is critical for the farm level supply responses to the price change identified above.

3.8 Impact of closing the live export trade on farm gate prices and total receipts

Region	Change in mutton price		Change in total receipts	
	$ per head	%	$ per farm	%
South Australia				
North Pastoral	**-7.6**	**-12.7**	-18 400	-3.5
Eyre Peninsula	**-7.6**	-12.2	-7 700	-3.6
Murraylands and Yorke Peninsula	-6.6	-10.0	-6 800	-4.3
South East	-5.6	-7.9	-10 600	-1.9
Victoria				
Central North	**-5.6**	-7.5	-2 900	-2.1
Wimmera	-5.6	-7.7	-2 400	-1.8
New South Wales				
Far West	-6.0	-9.6	-7 500	-3.3
Riverina	**-5.6**	-7.5	-4 000	-2.0

Source: ABARES/MLA survey and CIE calculations.

- Immediately following the closure of the trade, we would expect that woolgrowers have little or no scope to adjust turnoff levels and enterprise mix. With more time to adjust, they can take steps to change their enterprise structure.
- However, as a result of the falls in saleyard prices, woolgrowers will need to adjust their enterprise mix. Following similar logic for the WA analysis, supply elasticities of 0.4 for specialist producers and 0.6 for mixed enterprises were used for regional woolgrowers.
- Should the live trade close, the results reported here reflect an adjustment period of 3 to 5 years.

If the live export trade was closed in 2011-12 — and based on our assessment of likely decision making by woologrowers in each region based on prices and transport costs — the farm gate prices of sheep across the case study regions are estimated to fall by between $5.60 — for example, in the Central North and the Riverina — and $7.60 per head — in North Pastoral and Eyre Peninsula — over the medium-term (that is, 3 to 5 years into the future).

- As expected, those regions with the longest transport distances and fewer market options are hit the hardest where the farm gate price of sheep is expected to fall by up to 12.7 per cent
- For woolgrowers within easy transport distance of the large east coast markets, their farm gate price would fall in line with the east coast saleyard price of $5.96 per head noting that because of the structure of agents' commission and MLA levy, the farmgate price would fall by $5.60 per head.

To illustrate these results, take the Northern Pastoral region as an example. In the *with live trade* case, woolgrowers in this region sell:

- 30 per cent of older sheep for eventual sale to live export depots (table 3.7) while the remaining 70 per cent go through saleyards at Dublin or OTH

- the farm gate return from the live trade after transport is approximately $64 per head — compared to $57.40 through saleyards based on a saleyard price of $73.40 per head for 2011-12 — the difference is mainly due to commissions and fees payable.

In the *without* live trade case, woolgrowers need to divert sheep back onto the domestic market:

- as a result of closure of the trade, *all* older sheep saleyard prices drop by $5.96 per head, in line with the fall in eastern states prices (from $73.40 per head to $67.40 per head) which after commission translates to a reduction of $5.60 per head
- in addition to this, woolgrowers also suffer an additional loss as a result of increased transport and marketing costs for those sheep that were sold to export depots
  - The farm gate return for these sheep falls from $64 to $51.80 per head ($12.20 per head difference) but only for the 30 per cent that were sold to the trade.
- the final result for this region is an average price fall across all sheep sales of $7.60 per head. This is comprised of a:
  - fall in $12.20 per head (by 30 per cent of total sheep sales previously sold to the live trade)
  - $5.60 per head (by 70 per cent of total sheep sales sold OTH or through saleyards).

The impact is significant, reducing total receipts of woolgrowers in the case study regions by an average of $6 400 per farm. The impact of a closure to the live export trade will vary across the case study regions due in part to the each regions dependency on sheep as an income source and transport distances to major markets.

- In particular for woolgrowers in the South East and North Pastoral regions, the closure of the live export trade represent a fall in total receipts of close to $10 600 and $18 400 respectively per farm. Woolgrowers in the Riverina suffer a fall of $4 000 per farm even though they have many alternative marketing options.

Accounting for the different output mixes for each farm type, the modelling indicates cash receipts across all the case study regions will fall by 2.5 per cent or $67.8 million (see table 3.9) in 2011-12 terms split evenly between specialist producers and mixed enterprises.

3.9 Impacts on total receipts of woolgrowers in case study regions[a]

Region	Specialist	Mixed	Total
	$m	$m	$m
South Australia			
North Pastoral	-3.4	-1.9	-5.4
Eyre Peninsula	-1.9	-4.6	-6.5
Murraylands and Yorke Peninsula	-10.1	-2.9	-13.0
South East	-4.8	-15.0	-19.7
Victoria			
Central North	-2.9	-1.1	-4.0
Wimmera	-1.6	-1.5	-3.1

New South Wales			
Far West	-4.1	-1.4	-5.5
Riverina	-6.5	-4.1	-10.6
All case study regions	-35.4	-32.4	**-67.8**

[a] Compared to 2011-12 levels

Source: ABARES/MLA survey and CIE calculations.

- This impact is roughly 22 per cent of the impact to WA woolgrowers in revenue terms. This makes sense given that woolgrowers in eastern states have many more marketing options at their disposal.

To put the impact woolgrowers in perspective, table 3.10 shows the percentage change in receipts that would be likely if live exports were to close. This change would hit specialist producers hardest in percentage terms because of their dependence on livestock receipts and lack of scope to move to other enterprises. For mixed enterprises, this adjustment is smaller in percentage terms but of a similar magnitude in dollar terms to specialist producers across the region.

The largest impact in percentage terms is seen in the Northern Pastoral, across the Eyre Peninsula, Murray Lands and Yorke Peninsula and the NSW Far West. In these regions, mixed and specialist sheep farms have a relatively high dependence on sheep and, in particular, sales of sheep into the mutton market. Conversely, regions such as the Riverina and the south east of South Australia that have a relatively low share of sheep in sales in the income of mixed and specialist sheep farms is relatively low recorded smaller falls in farm receipts.

3.10 Percentage change in total receipts of woolgrowers in case study regions[a]

Region	Specialist	Mixed	Total
	%	%	%
South Australia			
North Pastoral	-3.7	-3.1	-3.5
Eyre Peninsula	-6.3	-3.1	-3.6
Murraylands and Yorke Peninsula	-5.6	-2.4	-4.3
South East	-1.8	-2.0	-1.9
Victoria			
Central North	-2.2	-2.0	-2.1
Wimmera	-1.6	-2.1	-1.8
New South Wales			
Far West	-3.0	-4.6	-3.3
Riverina	-2.4	-1.6	-2.0

[a] Compared to 2011-12 levels.

Source: ABARES/MLA survey and CIE calculations.

Gross margin analysis

The next step is to translate these changes into profitability by conducting a similar exercise to that for the WA analysis. Table 3.11 shows that on a gross margin basis the majority of losses borne by woolgrowers are the result of lower profitability of the breeding enterprise rather than the wether flock.

The reason for this is based on the same logic as for the WA analysis: the result for the wethers enterprise is comprised of three components:

- lower returns for flock culls
- higher returns for the wool clip
- lower cost of replacement hoggets.

3.11 Impacts on gross margins of eastern state woolgrowers[a]

Region	Gross margin per head		Gross margin per farm		
	Ewe flock	Wether flock	Ewe flock	Wether flock	Total
	$ per ewe	$ per wether	$	$	$
South Australia					
North Pastoral	-4.8	-1.2	-14 000	-400	-14 400
Eyre Peninsula	-4.6	-1.1	-3 900	-300	-4 200
Murraylands and Yorke Peninsula	-3.7	-0.8	-2 900	0	-2 900
South East	-2.9	-0.4	-3 600	-100	-3 700
Victoria					
Central North	-2.7	-0.3	-2 400	-100	-2 500
Wimmera	-4.8	-1.2	-2 200	-100	-2 300
New South Wales					
Far West	-3.9	-0.7	-7 800	-200	-8 000
Riverina	-2.7	-0.3	-3 900	0	-3 900
All case study regions	-3.2	-0.5	-3 800	-100	-3 900

[a] Compared to 2011-12 levels.

Source: ABARES/MLA survey and CIE calculations.

For the enterprise, the flow-on impact to the price of lambs and flock culls is not offset sufficiently by the increase in the wool price. ABARE/MLA survey estimates for the number of ewes and wether flocks by regions for 2011-12 were used to estimate an impact on a farm basis.

The impacts at a regional level on a per head and a per farm basis are consistent with those outlined in table 3.9. Across case study regions, average gross margins fell by $3 900 per farm, the majority of the loss coming from the ewe enterprise.

After accounting for the estimated number of farms in each region, this loss equates to a reduction in gross margin valued at $43 million in 2011-12 terms over a period of 3 to 5 years. This is a rough estimate that can be cross-checked with the estimated fall in total cash receipts of $67.8 million across the case study regions shown in table 3.9.

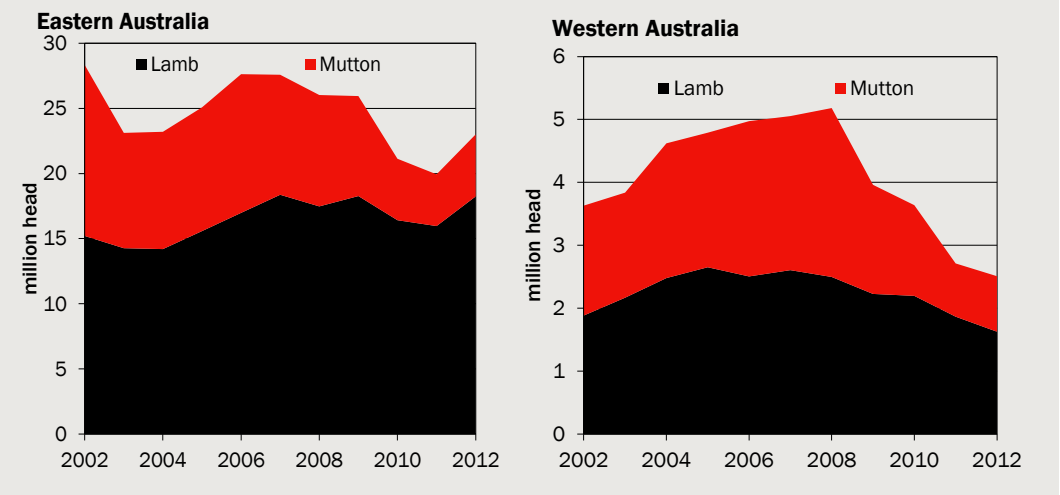
A Recent market developments

The market drivers for the wool and sheep industries are:

- recovery in wool prices
- continued strong demand for lamb, mutton and live sheep
- an underlying structural shift in production away from sheep enterprises
- variable and poor seasonal conditions in different production regions.

Charts A.1 shows that recent falls in sheepmeat prices have coincided with better seasonal conditions in the eastern states and higher numbers slaughtered. This is especially the case of Western Australia where a combination of dry years and a strong move away from sheep enterprises has resulted in a fall in slaughter numbers.

A.1 Slaughter of sheep in eastern states and Western Australia



Data source: ABS

To better understand the impact of the live trade, it is necessary to identify underlying trends, which represent the baseline, from which the impact of the closure of the trade is compared.

The first step is to recognise that production of lamb, mutton and wool take place within the context of multi-product enterprises where substantial structural change has been taking place. In this section, we draw on the ABARES/MLA surveys to build a detailed picture by following the ABARES convention that:

- a sheep producer is any broadacre producer with more than 200 head of sheep
- a specialist sheep producer is a sheep producer who earns more than 50 per cent of receipts from the sale of sheep, lambs or wool

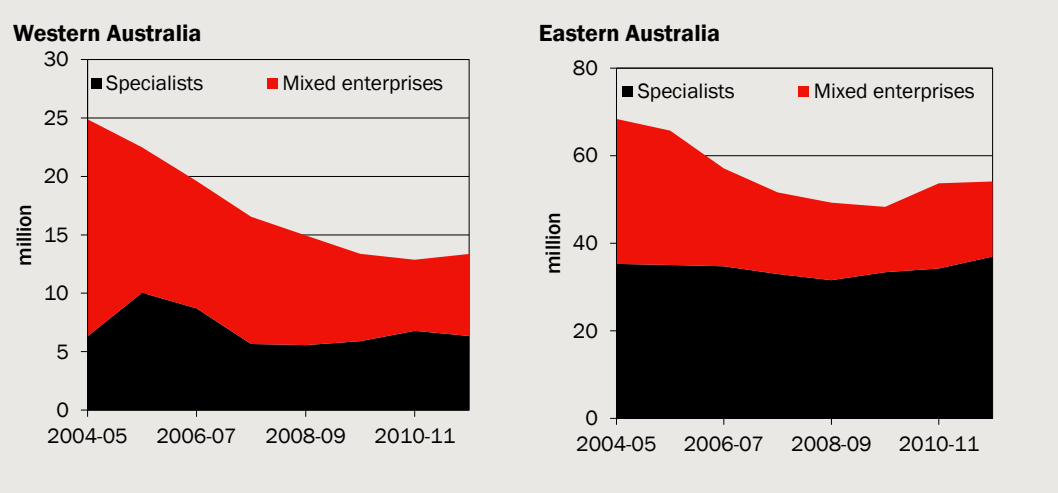
- specialist producers are primarily dedicated wool and prime lamb producers, some of which have made dedicated supply changes to develop certain sheep types targeted at the live trade.

Chart A.2 shows the how structural adjustment in the Australian broadacre agriculture has translated into flock numbers by segment. The majority of the decline in the Australian flock has occurred in the mixed enterprise segment in both regions:

- flock numbers have fallen by over 62 per cent in mixed enterprises in Western Australian and by nearly 50 per cent for eastern states
- the overall decline in the national flock of 27.7 per cent from the survey is similar to that observed in the other statistics published by ABARES.

In comparison, there have been minimal changes to flocks held by specialist producers over the period.

A.2 Flock numbers in the Australian sheep industry by segment[a]



[a] Note different scales on graph.

Note: Total sheep flock implied by the ABARES survey represents around 73 per cent of those identified in AWI Forecast Report

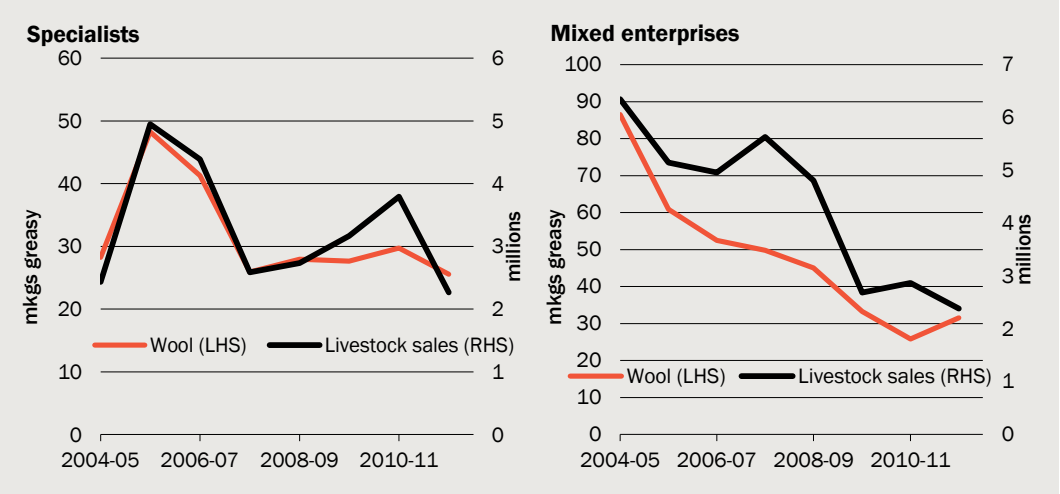
Data source: ABARES MLA Farm survey.

These changes are a critical part of the baseline, such that there needs to be a focus on Western Australia that supplies 70 per cent of the sheep to the live trade. Chart A.3 shows that sheep sales and wool production have fallen by over 60 per cent for mixed enterprises and less so for specialist producers.

Over the corresponding period, as seen in chart A.4, falling production was offset by strong growth in sheepmeat prices, and to a lesser extent, for wool. Nominal revenues for wool and sheep:

- increased, on average, by 50 per cent for specialist producers over the period
- fell by only 10 per cent, on average, for mixed enterprises despite the huge reduction in sheep numbers.

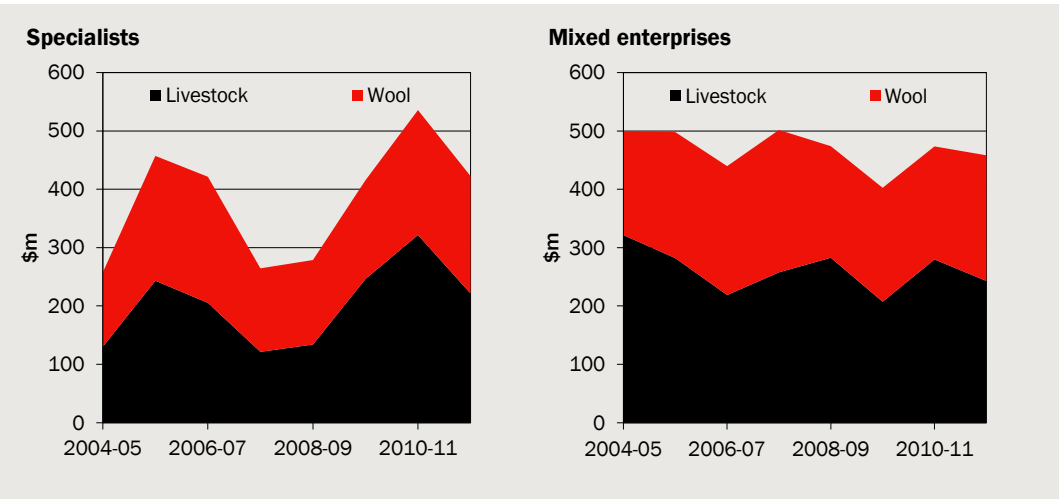
A.3 Production in sheep enterprises in Western Australia[a]



[a] Note different scales on graph.

Data source: ABARES MLA Farm survey.

A.4 Revenue from wool and sheep sales in Western Australia[a]



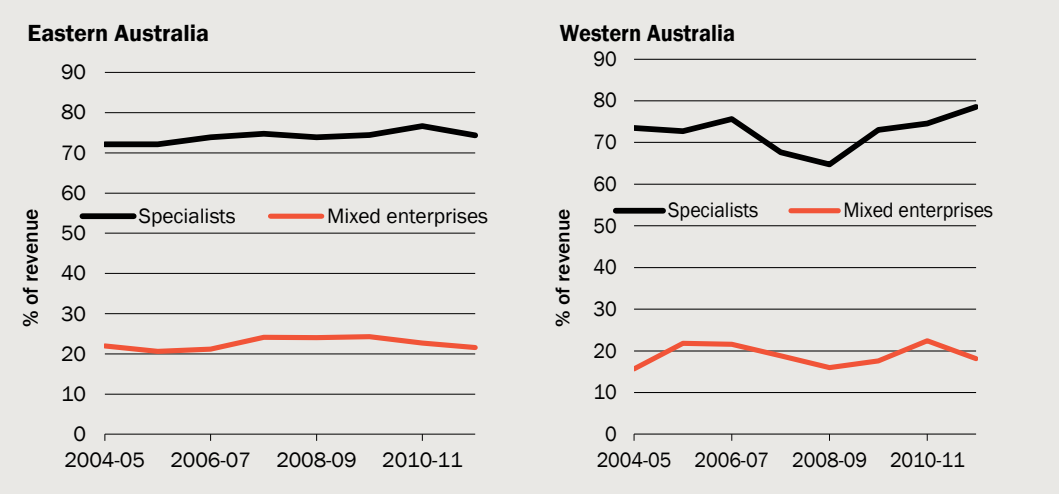
[a] Note different scales on graph.

Data source: ABARES MLA Farm survey.

For eastern Australian states, the structural change away from sheep in mixed enterprises is significant, but less pronounced than for Western Australia. This means that total revenue from wool and sheep in the eastern states increased strongly for specialist producers and maintained for mixed enterprises.

The key to the structural change story is the mix between cropping and sheep enterprises. The maintenance of revenues from wool and sheep sales, relative to cropping, is best summarised in chart A.5. Despite the reduction in sheep numbers across mixed enterprise operations, across the industry, wool and sheep sales held steady at 20 per cent of total farm receipts.

A.5 Wool and sheep revenue across all enterprises[a]



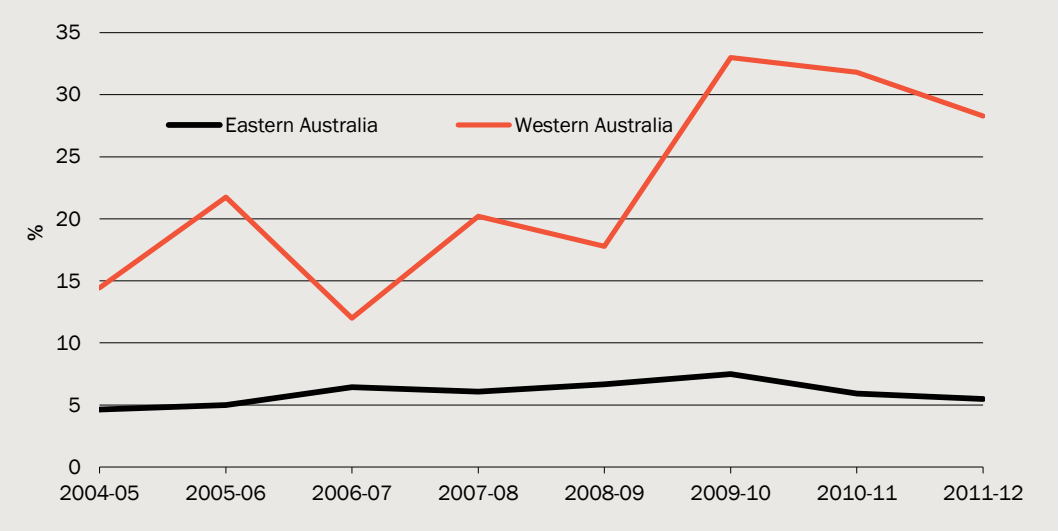
[a] Wool and sheep revenue as a percentage of total farm revenue.

Data source: ABARES MLA Farm survey.

The driver of this structural adjustment has been the dramatic shift in farm land in Western Australia away from livestock enterprises to cropping (see chart A.6). All of this adjustment has taken place in the mixed enterprise sector of the industry. The data supports anecdotal information that has been around for some time, which has been one of property consolidation, sheep enterprises closing down and fences being pulling out. There are a number of reasons for this shift:

- the labour intensity of sheep enterprises, especially for ageing owner-operators
- the availability of land suitable for large scale cultivation (substantially more in Western Australia than for the eastern states)
- the comparative lack of economies of scale for sheep compared to grains.

A.6 Cropping land in total land operated by sheep enterprises



Data source: ABARES MLA Farm survey.

Given the substantial purchase cost of machinery and equipment, the average operating costs in a grains enterprise would be expected fall dramatically with increases in scale. Also, for cropping there would be a corresponding increase in labour productivity, especially for the owner-operator, whereas for sheep enterprises the labour requirements per unit of output are relatively constant over a large range of operational sizes. If hiring additional (outside of shearing and crutching) labour is out of the question due to cost, the owner's own time will constrain the size of the enterprise.

B Wool and sheep industry supply response

On this question, the literature is dated and only provides estimates at a national level. The traditional view is that the aggregate supply elasticity of the wool and sheep industries is around 1.0. That is, a 1 per cent increase in price across lamb, mutton and wool would result in an increase in the flock of around 1 per cent. There is some sound logic for this:

- sheep compete for land and other resources with cropping and other livestock activities
- in order to maximise profit, producers will change their enterprise mix over time subject to key constraints (such as availability of suitable land and their own labour for use in each enterprises).

If producers have viable production alternatives to the sheep industry, supply responsiveness would be expected to be higher and a change in price would cause producers to leave the livestock industry. On the other hand, in the absence of viable alternatives, supply would be relatively unresponsive and a change in the livestock price would not lead to significant variation in supply.

Literature

The most recent study, which summarised the available Australian evidence, was Mounter et al (2008). It included a comprehensive review of supply elasticities of Australia sheep industries within the context of multi-product enterprises. The majority of the econometric evidence cited was based on data from the 1970s through the early 1990s. A characteristic of these studies were that there was a wide range of estimates over the short, medium and long term. For example medium estimates for the supply for:

- wool ranged from 0.36 to 2.02
- sheepmeat ranged from 0.3 to 2.02.

The relevance of these estimates is doubtful particularly given the deregulation of the wool market and more recently the wide-ranging structural adjustment that has occurred in the wool and sheep industry. Hence the estimates used by Mounter et al (2008, p. 50) are more relevant, as cited below:

> A weighted harmonic average of the supply price elasticities of the joint products wool and sheepmeat were used to obtain supply elasticity estimates of 1.2 for non-Merino sheep and 1.0 for Merino sheep.
>
> Compared with the high rainfall and wheat-sheep zones, the pastoral zone supply of sheep should be less elastic because of greater physical limitations on substitution possibilities between enterprise mixes. Conversely, the supply of sheep in the wheat-sheep zone should be more elastic than the other two zones as substitution possibilities in the enterprise mix are greater. As

such, the Merino sheep supply elasticity of 1.0 is used to represent the supply of Merino sheep in the high rainfall zone and values of 0.8 and 1.2 are assigned to the supplies of sheep in the pastoral and wheat-sheep zones, respectively.

Given this supply response at an 'aggregate' level, the next step was to recognise that each of the non-Merino and Merino ewe enterprises produce wool, lamb and mutton while the dry sheep enterprises, comprising wethers and hoggets, produce wool, mutton and live sheep exports. This requires an estimate of a product transformation elasticity: a measure of the responsiveness of the product mix to changes in relative prices.

Mounter et al (2008) use the following transformation elasticties:

- wool and lamb is set at -0.2 (where the merino flock is usually the proxy for wool and the non-merino flock for lamb production)
- mutton and live sheep exports is given a value of -1.8 indicating production can easily be varied according to the relative prices of each;
- wool and mutton and between lamb and mutton were assumed to be zero on the basis that mutton are cull animals.

From recent market developments

As noted in the CIE (2011) report and in this chapter, a significant proportion of land that is suitable for alternative production away from livestock grazing land in Western Australia has already been converted. This was also identified in appendix A.

There are two primary factors underpinning the case for using a relatively unresponsive supply relationship including:

- land use (agronomic) constraints — the land suitable for cropping is limited as identified above
- highly variable wheat yields in regions on the northern margin of the wheat-sheep zone and the bordering pastoral areas of Western Australia.
  - Factors such as weed resistance, soil structure and fertility decline are key factors inhibiting the viability of cropping enterprises.

On the other hand, in the event of lower prices, sheep enterprises always have the capacity to reduce stocking rates on existing grazing areas although this usually reduces the capacity of producers to cover farm fixed costs.

The responsiveness of supply would also vary by farm structure and location. Both specialist and mixed properties are likely to have already converted from livestock to cropping, where considered viable, as a result of the higher return per hectare offered for crops. Specialist producers, by definition, would be expected to have a lower supply response than for those where wool and sheep comprise less than 20 per cent of their income.

Therefore, for this study we have used a supply elasticity of 0.4 for specialist producers and 0.6 for mixed enterprises. This is more than half of those estimates that are typically used in modelling exercises or reported in the literature. Because of the level of uncertainty around these estimates, some sensitivity analysis will be conducted.

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