



Australian Export Grains Innovation Centre

The cost of Australia's bulk grain export supply chains

An information paper



Version 2014.3

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List of abbreviations

ABARES — Australian Bureau of Agricultural and Resource Economics and Sciences

ABS — Australian Bureau of Statistics

ACCC — Australian Competition and Consumer Commission

BAMA — Biosecurity and Agricultural Management Act

BDI — Baltic Dry Index

BHC — Bulk handling company

CBH — Cooperative Bulk Handling

CIF — Cost, Insurance and Freight

EBIT — Earnings before interest and tax

EPR — End point royalty

EU — European Union

FOB — Free-on-board

FIS — Free-in-store

GRDC — Grains Research and Development Corporation

GTA — Grain Trade Australia

IGC — International Grains Council

MMT — Million metric tonnes

NAT — Newcastle Agri-Terminal

NSW — New South Wales

PC — Productivity Commission

PIRSA — Primary Industries and Regions South Australia

Qld — Queensland

SAGIT — South Australian Grain Industry Trust

SA — South Australia

US — United States of America

Vic — Victoria

WA — Western Australia

Additional terminology

Glencore/Viterra — The group managing the grain handling task in South Australia will be referred to as Viterra, though Viterra is a wholly-owned subsidiary of Glencore Xstrata.

Acknowledgments

Many thanks to those in the industry who have more than generously contributed to this report through interviews and reviews of the document. Your time, effort and guidance has been much appreciated.



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Key findings

FINDING 1 SUPPLY CHAIN COSTS ARE 30% OF THE COST OF PRODUCTION

- Supply chain costs in Australia for wheat, travelling 200 km from farm to port, start at A\$60–75/t. As such, supply chain costs are generally the single largest cost item for a grain producer in a typical year.

FINDING 2 LIMITED DISCLOSURE OF PROFITS AND EFFICIENCY METRICS

- Within grain supply chains there is only a limited disclosure of costs and profit margins, although indications are that profit margins differ along the supply chain. There is no disclosure of efficiency metrics that allow inter year-comparison, as there is with our international competitors.

FINDING 3 PORT COSTS

- Port costs account for about a third of the supply chain costs and are not explicitly disclosed to producers as prices are quoted FIS or track. Furthermore it appears the port fees are rising at a faster rate than other grain handling charges.

FINDING 4 EFFECT OF VOLATILE PRODUCTION ON SUPPLY CHAIN COSTS

- The magnitude of supply chain costs is influenced by Australia's volatile grain production. This leads to building excess capacity within the chain to handle the large harvests. Logistics also are made more expensive, mostly due to production volatility and uncertainties.

FINDING 5 LIMITED TRANSPARENCY IN SHRINK AND DUST DEDUCTIONS

- Within grain supply chains there is variation in deductions for shrink and dust between regions and crop species. The technical and financial basis for the variation in these deductions is not well documented. Some costs in the supply chain, such as research and development (R&D) levies, or end point royalties (EPR) attract far more scrutiny and media attention than dust and shrinkage.



HIGHLIGHTS

- Supply chain costs in Australia for wheat, travelling 200 km from farm to port, start at A\$60–75/t. As such, supply chain costs are generally the single largest cost item for a grain producer in a typical year.
- There are differences in supply chain costs between regions. In a uniform case study comparison for 2013–14, WA had the lowest cost supply chain and Qld the highest. There are some sound and legitimate reasons for these cost differences as the cost structure in each jurisdiction is influenced by many factors, some unique to that region.
- There is about 55 million tonnes of bulk grain storage capacity at 623 sites across Australia — enough to store one and a half years' average national grain production. Handling efficiencies between these receipt and storage sites vary significantly.
- Within grain supply chains there is only a limited disclosure of costs and profit margins, although indications are that profit margins differ along the supply chain and are highest at port.
- Most bulk handlers now consolidate storage, freight and ports into one business segment for reporting purposes.
- Port fees are not explicitly disclosed to producers as prices are generally quoted as free-in-store (FIS) or track at port with port fees already deducted.
- Due to regional concentration of port ownership by grain handlers, most grain ports are subject to access agreements, as required by the Australian Competition and Consumer Commission (ACCC). There are however, new investors in port facilities — Newcastle Agri-Terminal (NSW), Bunge in Bunbury (WA) and Heilongjiang Feng Agricultural in Albany (WA).
- The magnitude of supply chain costs is influenced by Australia's volatile grain production. This leads to building excess capacity within the chain to handle the large harvests. Logistics also are made more expensive, mostly due to production volatility and uncertainties.
- Australia has four main bulk handlers and more than 20 export grain marketers. Major bulk handlers manage 70–90% of the grain in their region but 50–70% of the grain is exported by other grain marketers. This reflects the intense competition in international markets.
- Within grain supply chains there is variation in deductions for shrink and dust between regions and crop species. The technical and financial basis for the variation in these deductions appears to not be well documented.
- Some costs in the supply chain, such as research and development (R&D) levies, or end point royalties (EPR) attract far more scrutiny and media attention than some other costs of similar magnitude, such as dust and shrinkage.
- Australia has a shipping advantage into south-east Asia (Indonesia, Malaysia, Thailand and Vietnam), but not to north Asian countries such as China, Japan and South Korea.





Executive summary

The export grain supply chain is the system that collates grain from farms then distributes it to overseas end users. There are a set of processes that make up the supply chain, including storage, handling, freight and shipping as well as ancillary services such as financing, regulation and quality testing. Each of these is critical to delivering grain to end users, but each part involves a cost. Maintaining the balance between low cost and high service is critical to the competitiveness of the industry in the global market. A low cost supply chain that does not deliver timely, high quality grain may impose unseen costs, whereas a high cost supply chain needs offsetting reductions in cost, most likely by the production sector, to maintain competitiveness in international markets. This information paper report on the costs of Australia's export grain supply chain.

The producer's perspective

From a grain producer's perspective, grain supply chain costs depend on several factors, but chiefly the proximity of a receival point to the point of harvest, its distance to port, the mode of grain transport and the grain handling, storage and loading charges throughout this supply chain. In general, supply chain costs in Australia for wheat, travelling 200 km from farm to port, start at A\$60–70/t. As such, supply chain costs are generally the single largest cost item for a grain producer in a typical year.

Unique features of Australia's grain supply chains

A key consideration in understanding the efficiency and value of the Australian export grain supply chain is the capacity to export grain in the December to May marketing window. In this period the supply from competitors in the northern hemisphere is waning, and there are premiums and opportunities available in the Asian markets. There is significant benefit to traders in shipping during this period, with benefits realised by producers through increased price basis. These seasonal demands create competition for grain, rail and port services and shipping slots. Servicing these demands for throughput whilst providing for and managing multiple segregations in a full supply chain is a major challenge for bulk handlers.

Supply chains in Western Australia (WA) and South Australia (SA) are structured to deliver grain one way to port, as about 85–95% of the grain produced in these two States is exported. By contrast, about 50% of grain grown in eastern Australia is consumed locally, which results in grain travelling in various directions, utilising numerous modes of transport.

Australia's volatile grain production, due to seasonal factors, increases freight and logistics costs along the supply chain — excess capacity is required to accommodate large harvests following favourable seasons. Seasonal conditions also can affect the range and composition of grain quality, impacting on grain segregation costs. Having the capability to spatially and temporally react to a wide range of logistic requirements also creates additional costs.

Volatile production also poses problems for exporters keen to affordably lock-in freight and shipping requirements in advance of harvest. As a result, freight companies charge higher rates to accommodate the increased cost of excess capacity and short lead times.

By comparison, mining companies through their infrastructure investments and control of volumes from mine sites, can better control the timing of shipments, which leads to increased efficiency and much lower freight and logistic costs. Mining port and freight costs can be as low as a quarter of the cost of grain port and logistic costs.

Three large bulk handlers are dominant players in Australia's grain supply chains — Cooperative Bulk Handling (CBH) in WA, Glencore/Viterra in SA (subsequently referred to as Viterra) and GrainCorp in eastern Australia. Each of these companies owns integrated supply chains, including storage sites, rolling stock, ports, and exporting and marketing businesses in discrete regions. CBH handles 90–95% of the grain produced in WA and Viterra handles approximately 80% of the grain produced in SA. Both companies export around 45% of the grain in their respective states. By comparison GrainCorp, which operates in an environment with more competition at port and storage, handles 75% of east coast grain and accounts for less than 30% of grain exports from that region. This is in part due to the GrainCorp domestic investment in crushing, malting and milling facilities. Other significant bulk handlers include Cargill, with grain handling capacity in NSW, Vic and SA, and Emerald with handling capacity in Vic. While the bulk handlers dominate the storage and transport of grain, 50–70% of the grain is exported by any of up to 23 grain marketers in any season. This reflects the intense competition in grain trading in international markets.

Grain Storage and Receival

There is sufficient grain storage capacity across most of Australia to cater for a range of seasonal outcomes. There is about 55 MMT of bulk handling storage capacity at 623 sites across Australia. Combined with an estimated 15 MMT of on-farm storage capacity, Australia has capacity to store the equivalent of two years' average grain production. As a result, grain storage fees are kept relatively low and are falling in real terms. Many sites have a throughput ratio of one or less. Despite this there is an increasing trend for on-farm storage. This is particularly prevalent in eastern Australia as producers look to sell direct to local buyers, avoiding delays and associated costs at harvest due to slow receival turnaround times, while also maximising their marketing opportunities.

There is a wide range in the efficiency of receival and storage sites across Australia. Firstly, there is a broad range in the available storage capacities of receival sites and secondly, the train loading times can differ markedly.

Viterra has introduced a tier-based pricing structure for the 2013 winter crop harvest, applying a \$0.75/t surcharge to Tier 2 (less efficient) receival sites. This may encourage producers to deliver to more efficient sites, yet possibly lead to further site rationalisation. Such rationalisation will cause remaining sites, on average, to receive higher volumes, thereby lowering per tonne fixed costs, increasing capacity turnover ratios and providing the opportunity to increase site efficiency. However, offsetting these lower unit costs of receival will be additional transport and road damage costs incurred by grain producers hauling their grain over longer distances. Hence, some cost shifting will accompany any consolidation of receival sites.

Transparency in Costs and Returns?

Disclosure of profit margins along the grain supply chain is limited, however there are indications that profit margins differ along the supply chain. Bulk handlers now consolidate storage, freight and ports into one business segment for reporting purposes. As a result it is difficult to determine if pricing along the supply chain solely reflects costs. Viterra is part of the international conglomerate Glencore Xstrata and its SA bulk handling operations are not separately reported. The SA accounts are consolidated with other agricultural businesses in the group, making monitoring of the profitability of its supply chain segments difficult.

Due to the regional concentration of port ownership by grain handlers, most grain ports are subject to access agreements with required approval from the Australian Competition and Consumer Commission (ACCC). The ACCC are in the process of rewriting the port access undertakings to replace them with mandatory codes of conduct, though they are yet to be finalised (as of January 2014). Port facilities are operated under a fee-for-service arrangement to ensure the local natural monopoly position of a bulk handler does not affect the ability of other accumulators to access the port facilities. The presence of new port facility investors signals that port margins are sufficient to attract new entrants. Newcastle Agri-Terminal (NSW), Bunge in Bunbury (WA) and Heilingjiang Feng Agricultural in Albany (WA) are currently constructing port terminal facilities.

Ports and Shipping

The Kwinana and Port Kembla terminals are the fastest loading terminals in Australia with capacities of 5000t/hour. This loading rate is impressive by international standards — by comparison Canadian ports have maximum loading capacities of 3400t/hr. However, congestion occurs at Australian ports during what exporters term the 'marketing window' during the first few months of the year when supplies in the northern hemisphere are running low. This rush to gain the typically higher price means shipping slots during this period are in high demand and limited in availability. As a result, shipping slot auction and management systems have been introduced.

Port fees have risen at a faster rate than storage and freight fees. Producers are typically quoted prices on site, or track or free-in-store (FIS) at the port, so the port charges are already deducted from the price offered by the grain marketer or buyer. As a result producers do not see the itemised port fees.

Grain deliveries are subject to shrinkage and dust deductions. These costs vary between regions and crop species and shrink can be charged to the producer twice if grain is delivered into port by a third party. The technical or financial basis for the variation in these rates appears not to be well documented. Some costs in the supply chain, such as research and development (R&D) levies, or end point royalties (EPR) attract far more scrutiny and media attention than some other costs of similar magnitude, such as dust and shrinkage.



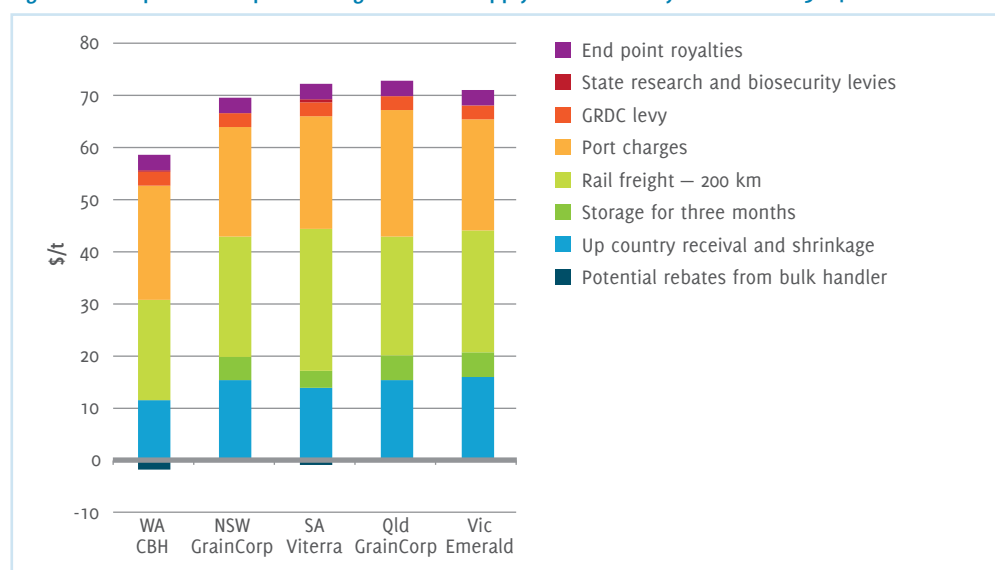
Beyond the ports, Australia has an internationally competitive shipping advantage into south-east Asia (Indonesia, Malaysia, Thailand and Vietnam). Sea transit time to Indonesia is 6.5 days from WA and 13.5 days from NSW. This equates to 25–50% of the transit time to Indonesia from ports in the United States of America, Canada or the Ukraine. As a result, Australian bulk freight rates are a third to half those from the Americas, translating to a current bulk freight advantage of about US\$15–22/t. However, this advantage is sensitive to the magnitude of international shipping freight rates.

Australia does not have significant shipping freight distance, and therefore cost advantages over the west coast of North America into north Asian countries, such as China, Japan and South Korea. The cost difference for bulk freight is currently only \$1–2/t. However, Australia does have a significant freight advantage over the US Gulf and Ukraine into north Asia with sea freight distances and transit times from the US Gulf and Ukraine to north Asia double the transit time from Australia.

Regional Comparison of Supply Chain Costs

Regional differences in supply chain costs become apparent for 2013–14 when comparing farms 200 km from port, which produce wheat sold for \$320/t FOB after three months of grain storage (see Figure 1). For this uniform case study scenario, the post-farm-gate costs per tonne of wheat were: \$58, \$69, \$73, \$70 and \$72 for WA, NSW, Qld, Vic and SA respectively. Western Australia and Queensland had the lowest and highest supply chain costs respectively. There are some sound and legitimate reasons for these cost differences. The cost structure in each jurisdiction is influenced by many factors, some unique to that region.

Figure 1 Composition of post-farm-gate wheat supply chain costs by State for 2013–14



Source: AEGIC 2013

Using these cost comparisons to make judgments about the management and operation of grain supply chains in any region is unwise. For a variety of reasons each region has unique cost structures, so great care is needed in drawing inferences from any regional comparison.

Introduction

Grains research in Australia mostly focuses on the on-farm production of grain. By comparison, few research studies have investigated Australia's grain supply chains. To address this gap, this report provides information and analysis of Australia's grain supply chains.

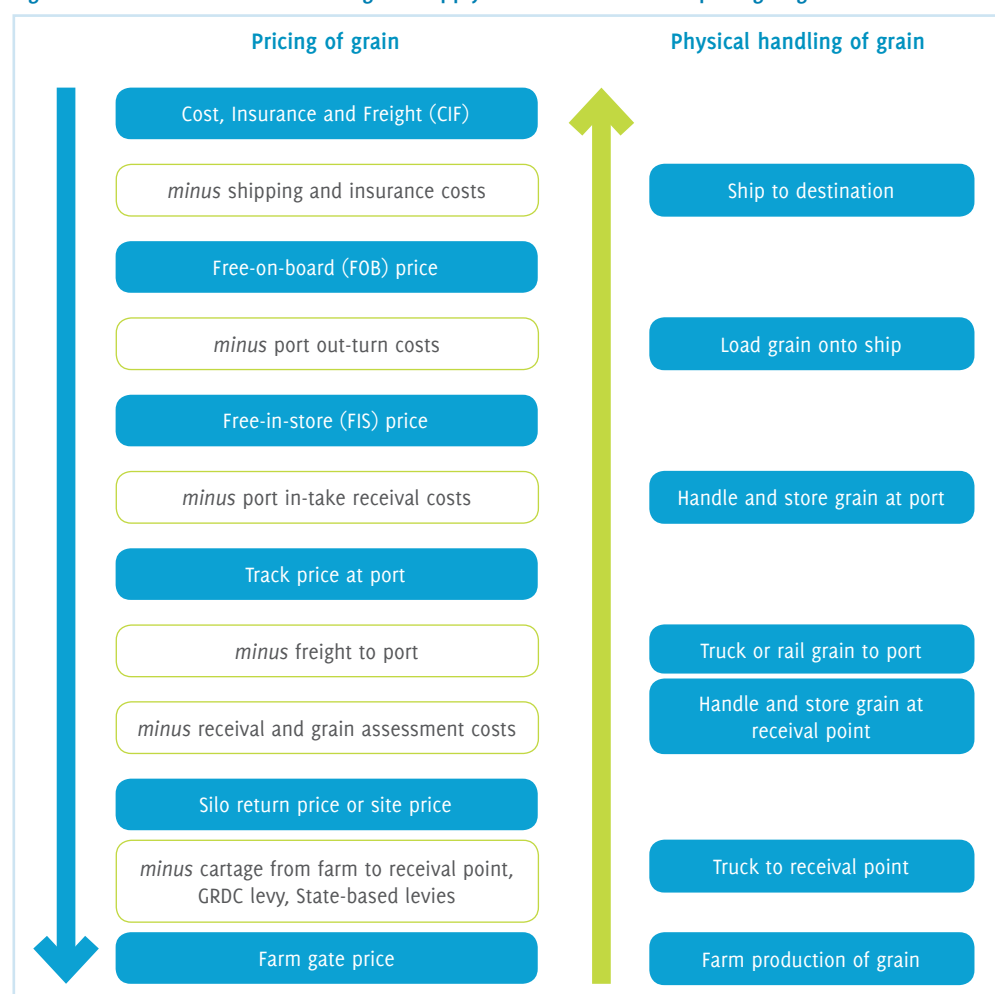
In this report wheat is almost solely used to illustrate supply chain costs as it is the main grain grown and exported by Australian grain producers. The supply chain components described in the following pages are:

- (i) On-farm wheat production – the source of the wheat supply chain.
- (ii) Storage across the supply chain – on farms, at receival points and at ports.
- (iii) Freight to port charges.
- (iv) Port and loading fees.
- (v) Shipping costs.
- (vi) Other fees and charges within Australia's grain supply chains.

The purpose of the report is to provide information about Australia's grain supply chains and in turn, identify issues relevant to Australia's grains industry.

A schematic overview of a typical supply chain for an exported grain is given in Figure 2. The physical flow of grain is from farm to its export destination. However the pricing of grain is principally determined on international markets with supply chain costs being sequentially deducted to generate a farm gate price.

Figure 2 A schematic overview of a grain supply chain and associated pricing of grain



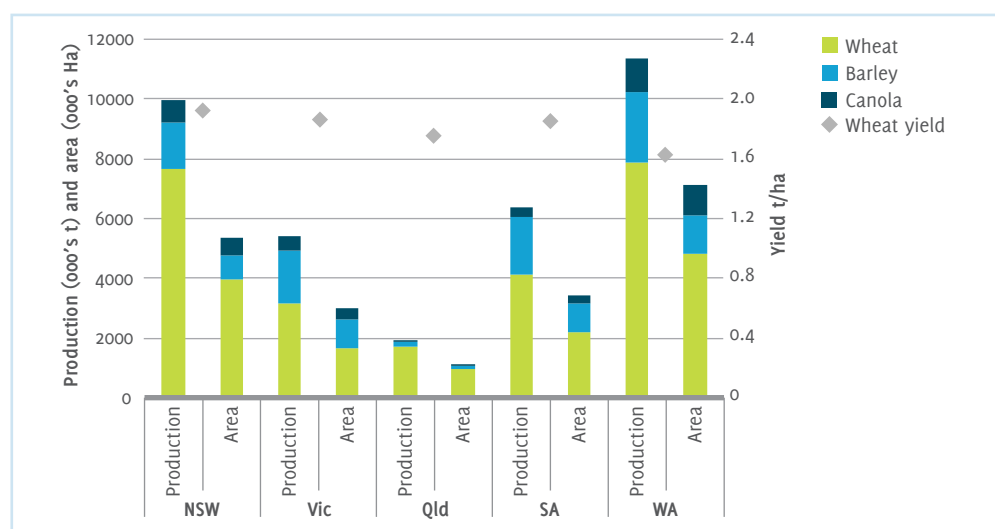
Source: AEGIC 2014



Grain production in Australia

During the past five years Australia's grain and oilseed production has averaged 35 MMT per annum. Across all grain-producing states, most grain production occurs within 200–600 km of the coastline, with longer distances in the production zones of eastern Australia. Western Australia and NSW are responsible for the bulk of Australia's grain and oilseed production (see Figure 3).

Figure 3 Production, area and yields by State (average of years 2002–12)



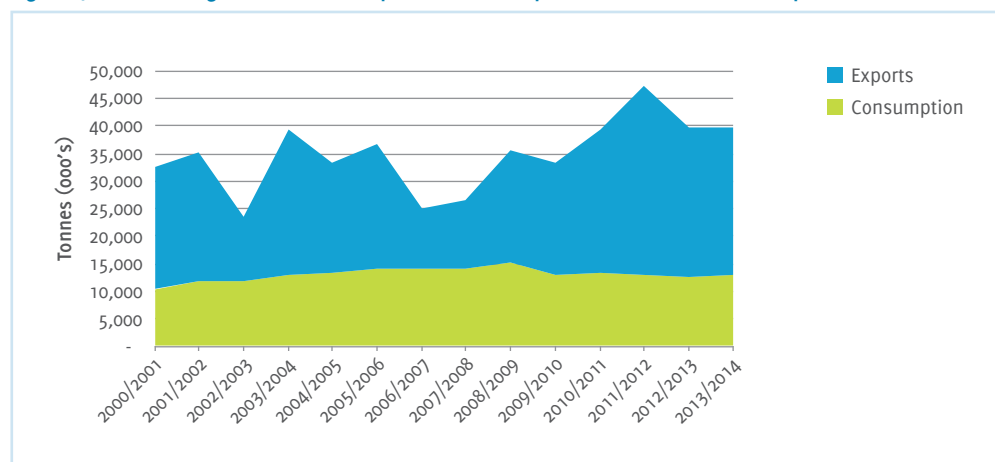
Source: ABARES (2013) Australian Crop Report

Domestic use and exports

Of the 35 MMT of grain produced annually, about 10–11 MMT is consumed domestically, leaving about 25 MMT available for export. Most of the domestic consumption (see Figure 4) occurs in eastern Australia.

Annual grain production in NSW, Vic and Qld has averaged 19.5 MMT/yr during the past 10 years, with approximately 50% of production available for export. Due to the greater relative importance of domestic sales in these States, their supply chains cater for domestic and export customers and export grain traders compete with domestic millers and feedlots for grain.

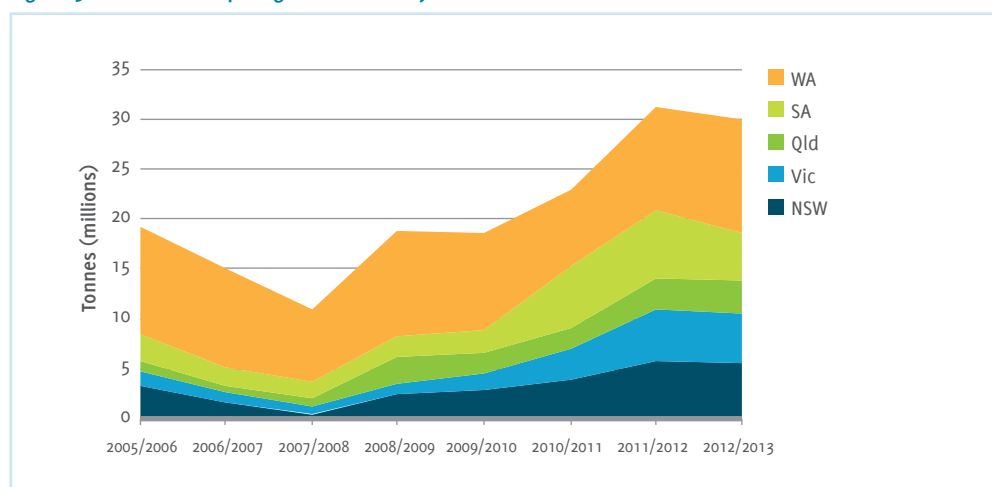
Figure 4 Australia's grain and oilseed production – export and domestic consumption



Source: USDA www.fas.usda.gov/psdonline

Western Australia and SA have small domestic markets, exporting 85–95% of their grain production annually. From an export trader's perspective SA and WA offer the advantage of far less competition from domestic buyers (see Figure 5).

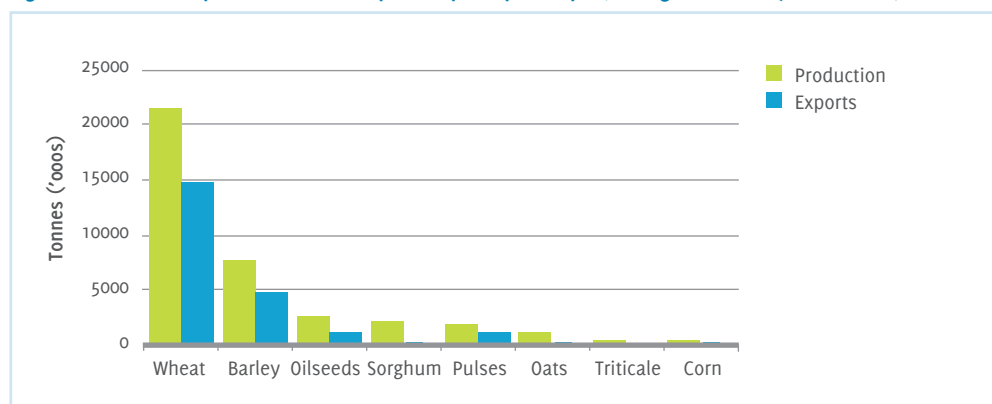
Figure 5 Australia's export grain volume by State



Source: Australian of Statistics (ABS) and Department of Agriculture and Food Western Australia (DAFWA)

The main grains exported from Australia are wheat, barley and oilseeds (see Figure 6). Wheat is the dominant grain exported and for this reason the wheat supply chain is in most cases a proxy for the grain supply chain.

Figure 6 Australian production and export of principal crops (average of 2006–07 to 2011–12)



Source: Abstracted from datasets in ABARES (2012a) Australian Commodity Statistics 2012



Key supply chain businesses

Australia is dominated by three grain bulk handlers — Cooperative Bulk Handling (CBH) in WA, Viterra in SA and GrainCorp in eastern Australia. Each of these bulk handlers owns and controls integrated storage, freight (rolling stock) and port operations in discreet regions leaving little direct competition between these operators. Table 1 lists indicators of the respective market share held by each bulk handler in storage and port throughput by region.

Table 1 Indicators of Australian major bulk handlers' market share along the export grain supply chain

	CBH (WA)	GrainCorp (eastern Australia)	Viterra (SA)
Average annual harvest (MMT)	10.3	20.0	6.0
Approximate domestic consumption (MMT)	1	9.5	1.2
% of harvest exported	92	50	90
Number of receival sites	197	70 + 200 on 'as-required' basis	92 (including 3 in Vic)
Market share — up-country	Receives and stores ~90% of WA's grain	Handles ~75% of east coast grain	80% market share of SA up-country grain storage (by no. of sites)
Storage (MMT)	20 (effective 15)	20	10
On-farm storage (MMT)	2.6	11.8 (NSW: 6.4, Vic: 3.5, Qld: 1.9)	1.2
Port ownership	4	7	8 (6 operating)
Market share — port throughput (%)	100	80–90	100
Market share — export tonnage (%)	48% WA bulk exports (2012–13)	28% eastern Australian exports (2012–13)	46% SA exports (2012–13)

Source: AEGIC

Table 1 highlights the following:

- **CBH and Viterra dominate grain handling in WA and SA respectively:** In these States, where there is no port or rail freight competition, the port owners receive, store and transport 90–95% and 80% of the State's export grain respectively. It is worth noting the dominance of CBH is about to be challenged by new port operators.
- **More competition along the supply chain in eastern Australia:** In eastern Australia GrainCorp owns the region's largest receival network, seven of the nine main bulk grain ports and handles about 75% of the region's grain. GrainCorp operates in a more competitive environment than CBH and Viterra, with Emerald owning 15 receival sites, rolling stock and one port, and Cargill owning 22 receival sites across NSW, SA, Vic and Qld and rolling stock. Wilmar Gavilon also operate a port in Qld which has capacity to export around 0.5MMTpa. Rail operator El Zorro, moved grain in Vic and NSW during past years, however it went into receivership during July 2013, leaving Pacific National the only independent rail operator in Vic. The rail company Aurizon operates in NSW and Qld, and Qube is operating in NSW with a share of the grain task.
- **Deregulation of Australia's grain market has seen the entry of a number of grain exporters:** While Viterra and CBH receive the majority of the grain in their respective States they only sell about 45% of grain exports. GrainCorp sells just less than 30% of the east coast grain exports, though has significant investment in domestic processing. This implies that 50–70% of grain exports in each region are sold into the international market by exporters who are not the major bulk handler in that region.
- **New competition is emerging, particularly at the ports:** CBH's monopoly of port terminals in WA is under challenge with the construction of port terminals in Bunbury by Bunge (80% complete) and in Albany by Heilongjiang Feng Agricultural and Vicstock. Bunge is already in the market to buy 2013–14 wheat and barley for delivery to Bunbury port mid-2014. Similarly in NSW the new Newcastle Agri-Terminal (NAT) is under construction and scheduled to be commissioned during December 2013. NAT is an independent logistics company formed during 2009 by Jock Carter and Martin MacKay. The investors in the project include the management team along with key exporters CBH Grain, Viterra and Olam.

Financial analysis of the bulk handlers

CBH and GrainCorp are the only major bulk handlers in Australia that publish annual accounts. As a result, profit analyses can be carried out to evaluate their performance. GrainCorp is a listed company and is evaluated by the investment community. As a result its disclosure and accounts are more transparent than those of CBH.

Viterra is part of the international conglomerate Glencore Xstrata and its SA bulk handling operations are not separately reported. The SA accounts are consolidated with other agricultural businesses in the group, making it difficult to monitor the profitability of the supply chain components separately.

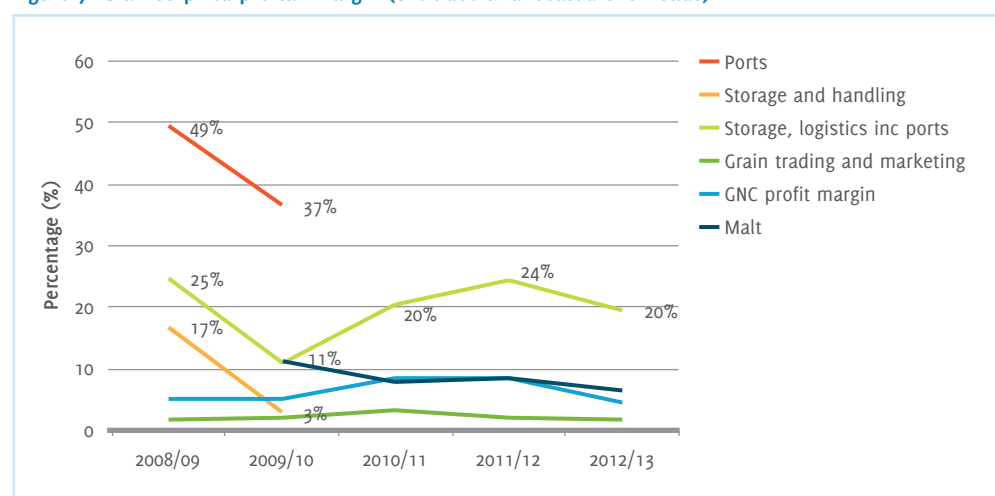
GrainCorp and CBH are the only bulk handling companies that release financial results of operations in Australia. The segment reports for the business units within GrainCorp and CBH are shown in Figures 7 and 8 for the years 2008–09 onwards. Both companies currently consolidate the up-country receipt, freight and ports into one business unit. During the four-year period to 30 September 2012, GrainCorp's supply chain generated pre-tax profit margins in the range of 11–25% while CBH's pre-profit margin for its supply chain varied from 19% during 2012 to a small loss in the severe drought of 2010. It is worth noting GrainCorp has a large proportion of costs unallocated to business units (see Figure 9). If these costs were allocated the margins would fall to a level closer to CBH's margins. By comparison, CBH often reports a profit as unallocated costs, which are not explained in their accounts.

Comparing these businesses and margins is difficult as they have different ownership structures. Comparing across a small number of years also does not truly reflect the impacts on each business of the variation in grain harvests, grain types (summer and winter crops and grain segregations) and grain prices that must be managed. Accordingly, some caution is required in drawing inferences from the data shown in Figures 7 to 10.

Figures 7 and 8 show the margins by division for GrainCorp and CBH over the four years to 30/9/2012 while Figures 9 and 10 show their respective pre-tax profit by business unit. The break-up of margin through the supply chain differs materially as indicated by GrainCorp's accounts up to 2010–11, when they segregated the profitability of port facilities from the storage and logistics business.

During 2008–09 the ports posted pre-tax margins of 49%, while the storage and handling business generated 17% pre-tax margins, which resulted in an 'average' margin across the supply chain of 25%.

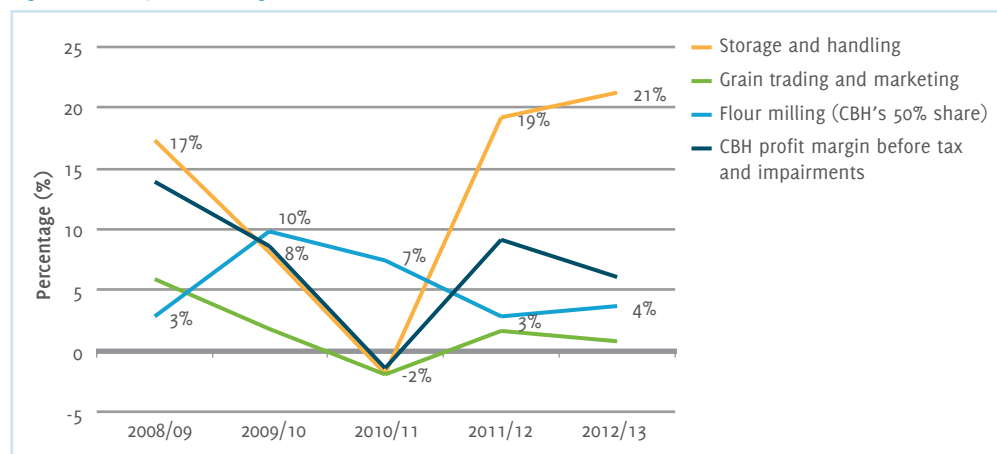
Figure 7 GrainCorp Ltd pre-tax margin (excludes unallocated overheads)



Source: GrainCorp annual reports



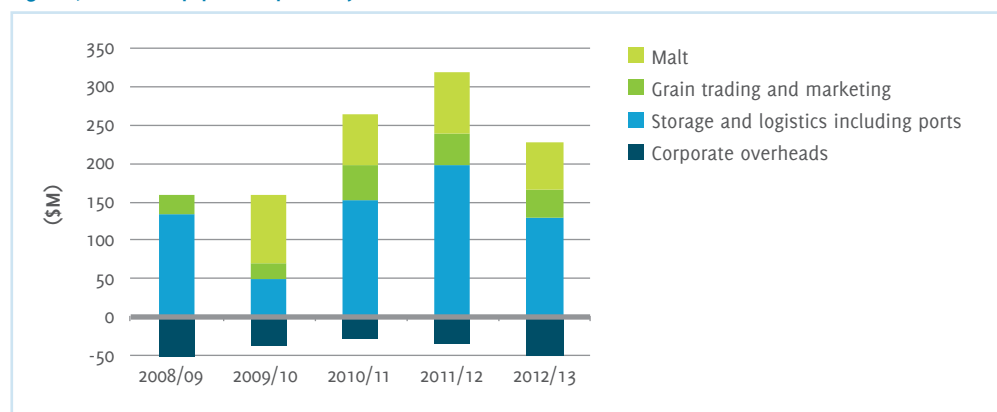
Figure 8 CBH pre-tax margins



Source: CBH annual reports

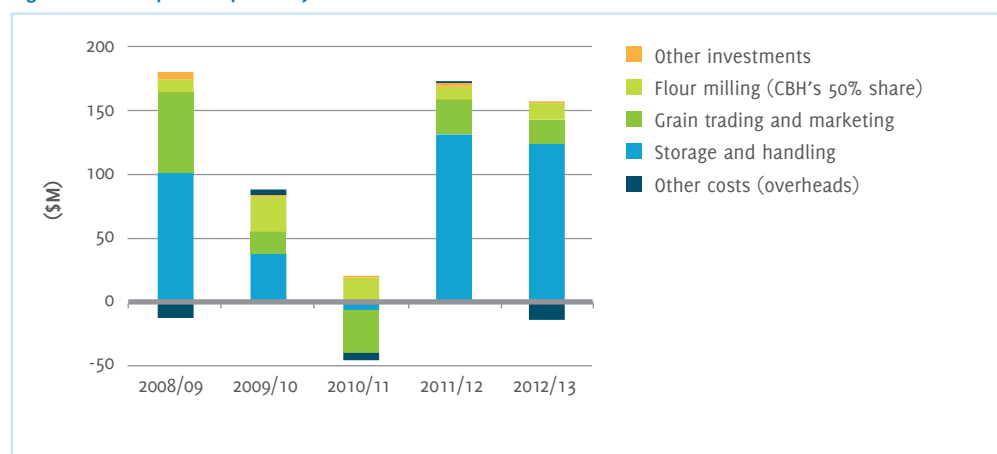
The ports' pre-tax margins appear attractive and perhaps are part of the rationale for the entry of NAT, Bunge and Vicstock into port construction in NSW and WA. It is worth noting the ACCC requires and provides oversight of port access agreements to ensure any monopoly position of a bulk handler does not affect the ability of other accumulators to access the port facilities.

Figure 9 GrainCorp pre-tax profit by business unit



Source: GrainCorp annual accounts

Figure 10 CBH pre-tax profit by business unit



Source: CBH annual accounts

Grain storage in Australia

There is an ample supply of storage sites across most grain-growing regions of Australia to easily accommodate most harvests.

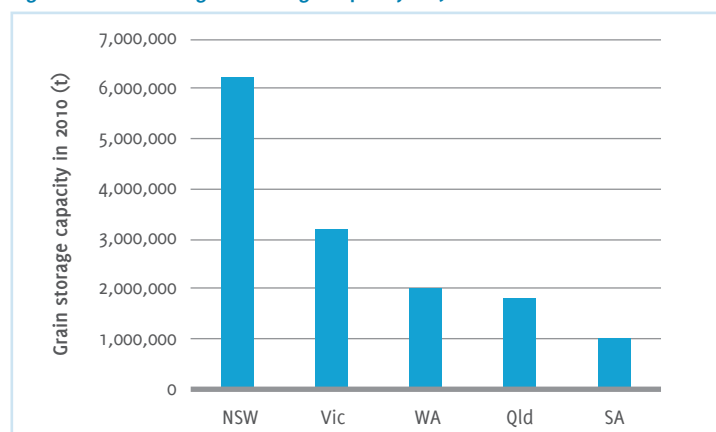
Bulk handlers' storage capacity

There are 55 MMT of bulk handling storage capacity across 623 sites in Australia. This includes port and up-country storage facilities owned by five bulk handlers — CBH, GrainCorp, Viterra, Emerald and Cargill. This storage capacity is equivalent to 1.6 times the nation's average annual grain production of 35 MMT. Arrangements such as Export Select in SA and Grain Express in WA are designed to motivate producers to deliver, store and freight with Viterra and CBH respectively.

On-farm storage

An Australian Bureau of Statistics (ABS) farm survey (see Figure 11) showed that at June 2010 the on-farm grain storage capacity in Australia was over 14.3 MMT. On-farm storage capacity in WA alone was 2.35 MMT and was forecast to grow to 4.2 MMT by 2012, or about 35% of average annual production¹. By comparison, industry sources estimate on-farm storage capacity across the eastern seaboard (NSW, Vic, Qld) totals around 11 MMT or about 60% of average annual grain production.

Figure 11 On-farm grain storage capacity at June 2010



Source: ABS 7121.0 — Agricultural Commodities, Australia, 2009–10

Total grain storage capacity

When total on-farm and bulk handling storage capacity in Australia is combined there is a potential total storage capacity of about 70 MMT — equivalent to two years of Australia's average grain production. Even taking into account the reduced overall capacity that will arise when grades are segregated, many receival sites are not fully utilised each year. The average receival site capacity turnover ratio, as measured by throughput-storage capacity, is less than 1:1 in Australia. This measure of site efficiency is considered very low compared with other grain exporting nations such as the US and Canada, where the average receival site capacity turnover each year is 6–7 times, though they operate closed access sites with only one buyer at each site. It must be noted that grain is mostly stored on farm in the US and Canada and storage tariffs at their sites are high compared with Australia. Moreover, grain production in the US and Canada is not subject to the magnitude of variation experienced in Australia.

A trend towards more on-farm storage — The current national trend is increased on-farm storage. The growth in on-farm storage, however, is comparatively less in WA, where bulk handler's storage and handling infrastructure remains attractive to use. In WA, on-farm storage was 2.4 MMT in 2010. Season 2010 was a widespread drought in WA that tempered investment in on-farm storage. However, more favourable production years in 2011 and again in 2013 along with the introduction of alternate supply chains have re-kindled interest in investment in on-farm storage in WA.

Viterra introduces tier 1 and tier 2 receival sites for 2013–14

As part of the move to reflect the most efficient and cost-effective operations of the storage and handling network, in 2013–14 Viterra has introduced two tiers of receival fees at up-country sites. Some smaller, less efficient sites will be priced 75 c/MT more.

¹ CBH Group Submission to the Rural Affairs and Transport Committee Inquiry into Operational Issues Arising in the Export Grain Storage, Transport, Handling and Shipping Network in Australia dated August 2011



Receival site consolidation

There is a wide range in the efficiency of receival sites across Australia. Firstly, there is a broad range in storage capacities of receival sites and secondly, the train loading times differ markedly. For example, CBH stated in 2009¹ that 73 of its 197 sites (37% of sites), received about 80% of the grain. This implies that 124 sites (63%) were being operated or maintained to receive just 20% of the grain and one could argue the industry's supply chain would be more efficient if sites were consolidated. Site rationalisation would lead to remaining sites receiving higher volumes thereby lowering per tonne fixed costs, increasing capacity turnover ratios and providing the opportunity to increase their efficiency.

There has been rapid consolidation of receival sites during the past decade in the US and Canada. For example, in Canada the number of delivery points (receival sites) has more than halved from 626 during 2000 to 271 during 2012. As a consequence the average trucking distance from farm to receival site has increased to around 80 km. By comparison, Australia has 623 receival sites with the average distance from farm to receival site of less than 20 km, a remarkably similar scenario to that of Canada back in 2000.

The incentive for bulk handlers to consolidate receival sites is to increase returns on their infrastructure through increased throughput and cost savings. The consequences for affected producers will likely be longer trucking hauls from farm to receival point as sites are closed and possibly higher storage fees designed to encourage just-in-time delivery. Greater volumes of grain through these sites will increase the returns on these assets.

Longer trucking hauls and slower turn-around times, together with higher storage fees will in many instances encourage on-farm investment in storage. Longer trucking hauls also will increase road damage, with those costs being shifted onto haulage providers and the tiers of government charged with maintaining roads.

Effectively, the cost of storage with the consolidation of storage sites would be shifted from the bulk handler to the producer. If this increasing trend in on-farm storage continues or is accelerated by site consolidation, then industry and government need to be prepared to manage the possible implications for road maintenance and road trauma costs and any grain quality implications associated with more on-farm storage, such as shrink, contamination, infestation and grain pest chemical resistance.

However, there are positive aspects of on-farm grain storage, such as allowing the harvest of crops to continue long after or before the receival point may be open or ready to receive grain helping the harvest of grain to occur more rapidly. When harvest bans apply, which could be expected to increase with current climate change projections, grain stored on farm can be carted to the receival point.

On-farm storage offers producers the flexibility to hold grain for blending, drying or grading post-harvest. These strategies can help producers avoid dockages and failures to meet grade specifications and also allows producers to harvest early, at higher grain moisture contents. A timely harvest reduces the risks of weather damage, which can reduce both yields and grain quality. Such advantages, nonetheless, need to be carefully weighed against the costs of longer haulage and turnaround times if receival site closures occur.

Storage fees and charges

The current fees associated with delivering grain for export by grain handlers is summarised in Table 2.

Table 2 2013–14 fees and charges by Australian bulk handling companies (BHCs) for wheat received and stored for a month

Fees and charge by type	Bulk handling company charges (\$/t)					
	CBH	GrainCorp	Viterra	Cargill/ Grainflow	Emerald	Aver.
Shrinkage factor (%)	0.5	0.7	0.6	0.7	0.6	0.62
Shrinkage and dust at \$320/t	1.5	2.1	1.8	2.1	1.8	1.86
Receival fee	10.00	6.90	11.85	8.86	12.00	9.92
Storage fee per month	0*	1.50	1.10	1.55	1.60	1.15
Out-turn charge — domestic and export	9.9**	6.18	2.6**	4.43	2.05	5.03
Total storage costs for one month and direct to port	11.5	16.68	14.75	16.94	17.45	15.46

* CBH does not charge storage fees until 1 October the following year. Note CBH producer rebates have not been included. ** Domestic out-turn only

Source: Company fees schedules

Key points to note from the storage charges outline in Table 2 are:

- Producers are charged a receival fee on delivery to the bulk handler's site ranging from \$6.90–12.00/t, a shrinkage and dust fee that accounts for changes in saleable grain volume, and a storage fee. With the exception of CBH, storage fees are applied monthly, with rates ranging from \$1.00–1.60/t/month (for 2013–14). Other storage groups do not charge storage fees to growers for 2–3 months after delivery (Emerald, GrainCorp, Cargill).
- CBH does not apply storage fees until October the following harvest. Hence storage to 30 September is included in their receival fee. This has been in place since 2009. The application of storage fees is important as it can influence producer decisions regarding investment in on-farm storage. For example, if a producer wanted the option to delay sales of grain for six months, hoping for a higher price, the bulk handling charges in WA would be \$11.50/t, considerably lower than the \$18–23/t fee in other States. With monthly storage fees and volatile grain prices there is a growing incentive for producers in the eastern states to invest in on-farm storage. However, in WA there is less incentive for on-farm storage as CBH's storage and handling charges often are competitive with on-farm investment.
- CBH provides rebates under its producer co-operative structure, which can be \$1–2/t these rebates are not included in this comparison, nor are dividend distributions or tax differences under the company structures of other bulk handlers.
- The domestic out-turn charge for SA is \$2.60/t and \$9.90/t in WA. At the moment there are no other export supply chains and very small domestic markets in these States, so there is little need for 'out-turning' of grain in these States.



Freight to port

In Australia the task of freighting 26 MMT of grain for export is shared between rail and road systems, with rail taking the greater volume of Australian export grain from receival sites to port.

The average distance to port from up-country receival sites is about 250 km. The rail systems linking up-country sites to port are a combination of high-traffic interstate rail lines and low-traffic grain-dependent rail lines. In many cases the up-country rail is used only for freighting grain, with little back-loading of wagons.

The road network linking the up-country receival sites to port is a combination of local roads, State roads and interstate highways. There are multiple port destinations in each State, with a mix of capacities to receive grain through road and rail.

Competitiveness of rail versus road

For all port zones, there is a significant catchment area where road transport costs are competitive with rail costs. The freight differential is dynamic, with road rates showing more flexibility and variability than fixed rail rates. The catchment area can be upwards of a 200 km radius from port depending on the season and subsequent road freight rates. In Western Australia and South Australia, the threshold distance is greater than the median distance to receival bins (Table 3). Road freight has advantages including scalability, lesser regulation and ability to redeploy to alternate industries in poor seasons.

Table 3 Summary of grain freight infrastructure and costs

	NSW	Qld	SA	Vic	WA
Average rail line access cost (Net c/t/km)	0.7	0.78	1.1	1.1	2.88
Median bin distance to port (km)	412	303	130	273	207
Modal share – rail to port (%)	85	46	50	53%	60%
Modal share – road to port (%)	15%	54%	50%	47%	40%

Sources: GTA 2013 www.graintrade.org.au, ARTC www.artc.com.au John Holland 2013 www.johnholland.com.au GrainCorp 2013 www.graincorp.com.au, Viterro 2013 viterro.com.au, National Transport Commission 2008 'Grain Supply Chain Pilot Study: Stage One Final Report', Other company websites.

Localised freight networks

Australia's grain freight networks are localised, with each State effectively operating their own separate network. Each State has a different mix of gauges, with standard gauge being used for the interstate lines, then narrow, standard or broad gauge for grain specific lines depending on the State. This arrangement limits the ability to optimise above-rail investment, having to spread investment across narrow and standard gauge rolling stock. The localisation of the networks extends to below-rail maintenance policy, and truck policy, where trucks crossing borders may face different load restrictions and capacities.

Production volatility impacts freight rates

The coefficient of variation in Australian export volumes is three times that of the US and Canada. For these northern American countries, the export volume is within 11% of the average in two out of three of years. For Australia, the export volume is within 27% of the average in two out of three of years. The consequence for Australia is that the freight industry must incorporate the capacity to flex up and down in response to production volumes and so excess capacity is built into the supply chain. The uncertain freight volume makes planning more difficult and risky, which is reflected in higher freight rates.

As grain exporters may not predict with any great accuracy the size or quality of crop available for export in advance of harvest, due to varying seasonal conditions in the varied regions, they generally contract a baseload number of pathways and if they require more grain to fill contracts they buy on the spot market. The cost of this volatility is greatest to the traders who do not own rail infrastructure, who must rely on access to services provided by the handlers.

By comparison, mining companies are less susceptible to weather and mining uncertainties. They can plan tonnage volumes and the timing of freight requirements and can lock in contracts for pathways in advance. In part, as a result, mining freight rates can be as much as a quarter of the rates applied to grain.

Low-efficiency grain-only railway lines

A high percentage of the Australian grain rail freight task is carried out by rail systems dedicated to grain. These are lower-efficiency lines with 16–19 t axle loads, compared with the 23 t axle loads on the interstate lines and the 23 t and upwards axle loading in the US and Canada. The 16–19 t rail lines run 2000–3000 net tonnes of grain per train. By comparison, the Fortescue Metals private rail line, a modern efficient railway in north-west WA, has 40 t axle loadings, and runs 29,000 t of ore per train.

Limited train size – limited infrastructure

Train size in Australia is limited due to several constraints. Firstly, as outlined above, the grain-dependent railway lines have limited axle loads, with varying speed ratings. Secondly there are constraints in this network through limited siding lengths on the single-track rail. These constraints limit wagon capacity and train length and subsequent train capacity. The US and Canadian systems are not limited in such a manner as their supporting infrastructure is matched to longer trains.

Further exacerbating the situation are handling delays in transferring grain from narrow and broad gauge regional lines to standard gauge lines.

Limited rail competition

In Australia, each of the semi-separate freight networks has one significant operator of above-rail services. While they are different between states, with CBH/Watco operating in WA, Genesee and Wyoming in SA, Pacific National and Aurizon in NSW and Qld respectively, there is limited competition for the rail freight task within each State.

Flexibility of fees

Eastern Australian rail customers use take or pay-based contracts, where there is a fixed tonne capacity and an *ad hoc* service provided where necessary. The *ad hoc* lines allow for additional capacity in high production seasons, although higher rates are imposed and there is coal or mineral exports competing with grain on the main lines to port.



Receival site efficiency

The rate at which trains are loaded in Australia varies from 120 t/hr to 1000 t/hr. However, storage and handling fees do not vary according to site loading efficiencies. To date, receival charges are a flat fee, regardless of the loading efficiency of the site. However, as outlined previously, Viterra is introducing tiered site-based pricing from 2013–14.

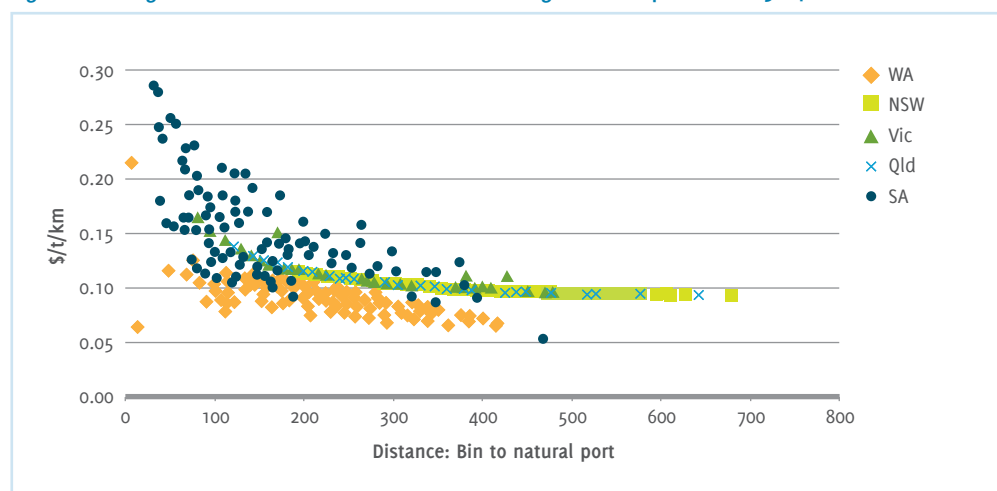
For the grain handlers with fixed pricing across all receival sites it implies that various loading speeds should be reflected in the freight rate. That is, longer loading times increase trains' operating costs (labour), which should increase train freight fees from that location. Benefits from efficient loading sites should be accrued by producers through lower receival fees, though they will be shared with traders.

Figure 12 is a plot of the freight cost per tonne per kilometre against distance to port for the Grain Trade Australia (GTA) freight differentials for WA, NSW, Vic and Qld. The WA freight rates include other factors, such as site efficiency in the freight rates. For example, sites 200 km from port can incur freight charges anywhere in the range of 7–10 c/t/km. There is some evidence that part of this difference is due to the nature of the site being a primary, secondary or surge receival site² although no storage site efficiency metrics are published.

The site pricings also reflect the efficiency of the site to deliver direct to the port, rather than circuitously. While the cost on a \$/t/km basis is calculated based on direct distance from receival site to port, the cost increases as the rail path becomes more circuitous³.

There are some similarities between the WA and SA systems with the distance to port not explaining all variation in pricing. This is not the case for the freight differentials in NSW, Vic and Qld where the quoted freight differentials are a direct function of distance to port. Industry sources have indicated while GTA freight differentials are not the actual freight rates charged by GrainCorp, they are close approximations and it would be reasonable to use them as an indication of actual rates. They are more likely to be used by traders who will on sell based on track prices without intending to physically shift the grain to an end user.

Figure 12 Freight differentials for receival bins and freight cost to port for 2013–14



Source: Grain Trade Australia www.graintrade.org.au, CBH www.cbh.com.au, Viterra viterra.com.au

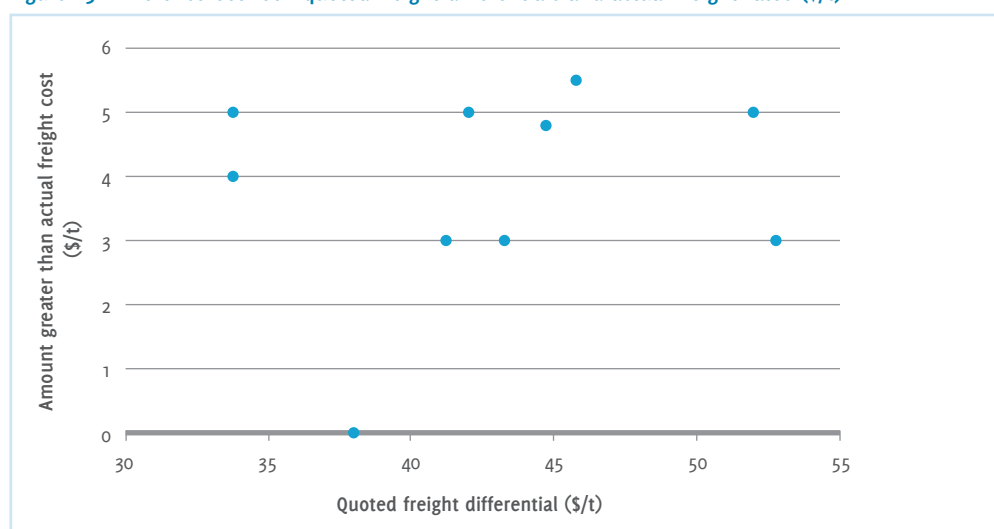
² AEGIC 2013

³ Distances are based on Cartesian coordinates, taking the most direct line to port. This captures the freight rate per direct kilometre as compared to the travelled kilometre, which may be a less direct route

Figure 12 demonstrates the GTA freight differentials in Australia's eastern States are a direct function of distance. For example all sites 200 km from port have a freight rate of 12 c/t/km regardless of loading efficiencies. Therefore receival site efficiency in the sites in eastern Australia is not factored into the storage and handling or freight charge and is likely to be reflected in the prices offered by exporters at the up-country sites. For example, sites that can load trains quickly are going to be more attractive to exporters trying to get grain quickly to port to load a vessel and therefore possibly willing to offer a slightly higher price at that site to attract more grain deliveries. Put another way, prices posted at inefficient sites are likely to be at a discount to reflect the additional cost of slow loading rates when compared with other sites.

A comparison of the GTA freight differential rate to the actual freight rates applied to some selected sites for AWB pooled grain is presented in Figure 13. For the selection of sites in Vic and NSW the actual freight charges was \$3–5–50 lower than the respective GTA differential. The freight differentials are mostly used by grain traders who intend to sell grain to other traders with no intention of transporting grain to port. This becomes an issue where producers have freight costs deducted from their price by grain merchants who are unlikely to freight the grain to port, effectively reducing the on-farm price of the grain.

Figure 13 Difference between quoted freight differentials and actual freight rates (\$/t)



Source: AWB www.awb.com.au/growers/awbpools/awbpools/

At this stage there is no site-based pricing in WA. All prices offered to producers are based on an FIS at port basis. Therefore producers need to arrange the storage, handling and freight to port and these costs are not included in the FIS price. Generally CBH arranges this and invoices the producer. While the ACCC has revoked the Grain Express model used by CBH to co-ordinate the grain freight task, allowing producers to choose the method of transporting grain to port, the incentives to keep grain in the system mean it is unlikely there will be a significant amount of grain transported outside of this system.



The grain belt in SA stretches along the coast with most sites within 200 km of a port, with the median distance being approximately 130 km. As such the efficiencies associated with long haul rail cannot be achieved easily. The cost is in the unloading and loading times and also reflects a high cost of access to rail in SA where there is a sole rail service provider. In general the Export Select freight rates in SA on a per kilometre basis are higher than other States (where data is available) as shown in Table 4. For example, a receival site about 200 km from port incurs a 9.5 c/t/km rate in WA and a 13 c/t/km rate in SA. The freight rates in the export standard model of transporting grain to port is high (though not included in Table 4) due to limited access to rail services. This higher price is due in most part to the need to use higher cost road transport, as there is limited competition in rail service provision.

Table 4 Comparison of quoted grain freight charges for various distances from bin to port in SA and WA

Distance from receival site to port	No. of sites	Freight charges (\$/t)			Freight charges (c/t/km)		
		2012-13	2013-14	% change	2012-13	2013-14	% change
SA							
100 km (± 10km)	11	16.13	15.55	-3.61%	0.164	0.159	-3.52%
200 km (± 10km)	7	28.21	27.54	-2.40%	0.141	0.138	-2.29%
300 km (± 20km)	4	30.95	29.55	-4.54%	0.104	0.100	-4.46%
All sites	110	21.75	20.51	-5.70%	0.166	0.156	-5.91%
WA							
100 km (± 10km)	2	10.01	10.22	2.01%	0.097	0.099	2.02%
200 km (± 10km)	11	18.81	19.25	2.31%	0.093	0.095	2.32%
300 km (± 20km)	11	23.63	24.30	2.8%	0.079	0.082	2.81%
All sites	190	18.74	19.19	2.39%	0.092	0.094	2.00%

Source: AEGIC 2013

There are some difficulties in describing and analysing freight rates. Historical datasets of freight rates from all receival sites are difficult to obtain, yet such data is needed to monitor changes in freight costs and assess the impact of these changes on producer returns. To get indicative rates for the east coast this analysis used GTA freight differentials as an indicative guide to freight rates. Only CBH and Viterro publish freight rates while other handlers including Cargill make freight charges publically available though not in a published form.



Ports

There is a spread of storage and loading rates across the ports in each State. Not all ports can accommodate all sizes of vessels. For example, some ports in SA are shallow, so larger vessels require top-ups from deeper ports, such as Port Lincoln.

CBH owns four bulk grain ports in WA (Kwinana, Geraldton, Albany, Esperance), with Bunge recently installing a new port facility in Bunbury. Viterra owns all the bulk grain ports in SA (Port Adelaide (inner), Port Adelaide (outer), Port Giles, Wallaroo, Port Lincoln, Thevenard) and GrainCorp owns seven of the nine major bulk grain ports on the east coast (Mackay, Gladstone, Fisherman Island, Newcastle, Port Kembla, Geelong and Portland). Emerald operate a port in Vic and Wilmar Gaviion operate a port in Qld. According to GrainCorp, it handles up to 80% of bulk grain exports from the region and has the capacity to handle up to 13 MMT of grain per year.

Most grain ports in Australia are subject to agreements with the ACCC to ensure any monopoly position of the bulk handler does not affect the ability of other accumulators to access the port facilities. These port facilities are operated under a fee-for-service arrangement and the grain exporters that provide port terminal services must have a formal access undertaking accepted by the ACCC.

Table 5 Comparison of operating ports – bulk grain

Port zone	No. of terminals (No. of owners)	Grain exports range MMT (5 yrs)	Grain exports average MMT (5 yrs) ^a	Storage capacity ('000t)	Volume exported/ tonne storage	Loading rate (t/hr)	Days loading	Ship capacity (Max DWT)
WA	4 (1) ^a	7.7–11.4	9.9	1000 (2500) ^b	10 x (4x)	1000–5000	4 (est)	60,000 ^c
SA	6 (1)	2.3–6.8	4.5	-	-	600–2000	2.3 ^d	60,000
NSW	2 (1)	2.5–5.7	4.1	424	10 x	4000–5000	-	120,000
Qld	4 (2)	2–3.3	2.6	315	8 x	900–2200	-	70,000
Vic	3 (2)	1–5.3	3.2	413	8 x	650–2500	-	70,000

^a Based on 2008–09–2012–13.

^a While there is another port being installed at Bunbury, it is yet to export grain as at December 2013. ^b This figure is for dockside storage at port. Quoted figures can range from 1–2.5 mt depending on the definition of 'port' storage. ^c There are exceptions, a recent incidence includes loading of a 77,000 tonne vessel. ^d For 2012–13

Sources: Information from company websites and ABS

Key points to note about the Australian ports are:

- **Restricted but changing competition** — In Vic, Emerald and GrainCorp operate separate port facilities. However, in other Australian States there is a single or dominant operator who is also a grain exporter, for all or most port terminals within that State. The competitive landscape is changing with the imminent entry of new port operators in WA (Bunge in Bunbury and Heilongjiang Feng Agricultural in Albany) and NSW (Newcastle Agri Terminal).
- **Access arrangements** — All exporters have access to the port owned by select bulk handlers who are also exporters. The access is regulated by the ACCC.
- **Export volumes are volatile** — The variation in export volumes at Australian ports is higher than that for North American competitor ports. This volatility is due to Australia's greater variation in production, which makes planning and investment decisions by Australian port operators more difficult and risky. This risk is ultimately factored into grain prices, which are higher than competitors, so the port operator can cover costs in low-volume years.
- **Kwinana (WA) and Port Kembla (NSW) have fast loading speeds** — By international comparison the Kwinana and Port Kembla terminals are fast-loading terminals with capacities of 5000 t/hour. By comparison Canadian ports have maximum loading capacities of 3400 t/hr. Faster loading rates can help lower port and vessel charter costs for the exporter, as turnaround time is faster. Furthermore the Kwinana terminal, which has a throughput of around 4 MMTpa has more than 1 MMT of storage capacity, making it one of the largest grain terminals in terms of storage capacity. Despite the storage capacity, Kwinana and other terminals with less storage capacity rely on just-in-time delivery from the rail operators.
- **Bottlenecks arise as traders chase the 'marketing window'** — In Australia there is a key marketing window, during the early months of the year, when exporters often extract higher prices due to diminishing supply from the northern hemisphere. This causes traders to compete aggressively for grain and shipping slots at ports during this period. Consequently, this rush to use the 'marketing window' causes congestion in the supply chain. At the other times of the year grain flow is easily managed with the existing infrastructure. This bottleneck can exacerbate the impact of delays where ships fail phytosanitary inspections. This exposes traders to risk of additional demurrage costs, and hence these risks are passed on to producers through reduced FOB prices.

Port fees and charges

Table 6 provides a summary of the minimum port fees for wheat deliveries by rail to the major export terminals across Australia. While each port operator applies fees differently, minimum port fees across Australia appear likely to range from \$18/t to \$22/t during 2013–14. This equates to a vessel loading cost of \$700,000–\$900,000/vessel based on a typical 40,000 t vessel. Surcharges for truck deliveries (up to \$1.87/t), fees for testing grain coming from third-party storage (i.e. not using the bulk handler's storage facilities) of up to \$3/t, shipping slot premiums, fees associated with special requests at port and cancellation fees have not been included in the fees schedule.

Table 6 Comparison of 2013–14 port charges for wheat deliveries by rail from a site owned by the port operator

Basic (cheapest) rail only, no optionals/third-party fees/special requests	Current WA ports (CBH) (\$/t)	Port Kembla (GrainCorp) (\$/t)	Adelaide — Outer (Viterrra) (\$/t)	Melbourne (Emerald) (\$/t)
Basic intake receival fee (rail only)	0	5.29	3.00	5.70
Vessel nomination	4.00	8.00	5.00	8.00
Vessel loading	15.30	3.49	13.20	3.30
Storage for the first week (for loading)	0	1.14	0.125	1.10
Inspection charges	0	0.25	-	0.25
Miscellaneous port/wharf fees	1.85	2.07	-	2.46
Dust	0.25%	0.25%	0.15%	0.10%
Base cost at \$320 FOB/t	21.90	20.99	21.78	21.11

Source: Company fee schedules

Victoria is currently the only State with competing wheat port terminals with cost data available for analysis. Table 7 lists a comparison of the 2013–14 storage, handling and port fees for Emerald, which has a port in Melbourne and GrainCorp, with ports in Portland and Geelong. In Victoria for 2013–14 the Emerald supply chain is marginally (2.3%) more expensive than the GrainCorp supply chain (\$0.89 compared to Geelong). GrainCorp's port fees in Victoria, however, are not lower than their port fees in NSW.

Table 7 Storage and port costs for 2013–14 for Victorian ports

Storage costs		GrainCorp (\$/t)	Emerald (\$/t)
Shrinkage factor		0.70%	0.60%
Shrinkage at \$320 FOB/t		2.11	1.81
Receival fee		6.90	12.00
Storage fees per month		1.50	1.60
Out-turn charge		6.18	2.05
Total storage one month direct to port		16.68	17.45
Port costs (Basic (cheapest) rail only, no optionals/third-party fees/special requests)	GrainCorp (Geelong) (\$/t)	GrainCorp (Portland) (\$/t)	Emerald (Melbourne) (\$/t)
Basic intake receival fee (rail only)	5.29	5.29	5.7
Vessel nomination	8	8	8
Vessel loading	3.49	3.49	3.3
Storage for the first week (for loading)	1.14	1.14	1.1
Inspection fees	0.25	0.25	0.25
Miscellaneous port/wharf/shunting fees	2.07	1.42	2.46
Dust/shrink	0.25%	0.25%	0.10%
Base port cost at \$320/t FOB	20.99	20.34	21.11
Storage cost	16.68	16.68	17.45
Total storage and port charges	37.67	37.02	38.56

Source: Company fee schedules



A single year of observation is not a sufficient foundation from which to draw useful conclusions about the relative costs at different ports. A longer time series that captures the impacts of variation in grain volumes and quality is required to gauge the impacts of port competition in any region.

Shrinkage and dust

According to statements by Viterra to the ACCC “shrinkage means loss in the normal storage and handling process, including loss of mass through changes in moisture content, loss in handling, and waste. Shrinkage does not include bulk wheat lost as dust”. Viterra add that dust “means bulk wheat dust extracted from dust collection plants in the Company’s facilities when loading a client’s grain. Dust excludes damaged bulk wheat and is not included as part of shrinkage”.

Deductions for shrinkage and dust are different for different crops and differ between bulk handlers (see Tables 6 and 7). By illustration, CBH has no dust deduction on oats or field peas while all other crop species attract a dust charge of 0.25%. Field peas, oats, chickpeas, lupins and canola attract shrinkage charges of 1%, 1%, 0.75%, 0.5% and 0.5% respectively. During 2013–14 GrainCorp increased cereal and canola shrink from 0.6% to 0.7% and shrink in legume/pulse and other grain increased from 0.8 to 1%.

In general, the volume of grain delivered is deducted by a percentage for shrinkage. This is often done each time the grain changes hands despite inadequate measuring equipment⁴. If a producer delivers to one bulk handler’s up-country site 0.5–0.7% is deducted in shrinkage. If the same producer then delivers the same grain from that site to another bulk handler’s port, additional shrinkage deductions may be incurred.

There is a shrinkage range of 0.5–0.7% for wheat across Australia. The financial implications are that, at a wheat price of \$320/t FOB, the shrinkage cost varies from \$1.50–\$2.10/t across Australia. The costs of shrinkage alone are equivalent to half of all end point royalty (EPR) payments, yet the publicity and concern around these royalty payments completely dwarfs any media attention surrounding shrinkage payments.

A further deduction on volume is made at the ports for dust. This varies from 0.1–0.25% (see Table 8). The technical and financial rationale for the differences in deductions for shrinkage and dust between crop species and regions is not well documented.

The combined costs of shrinkage and dust range from 0.7% to 0.95%. This means at a wheat price of \$320/t FOB, these costs amount to payments of \$2.10/t–\$2.85/t. By contrast, the GRDC levy for wheat is 1.02% of the farm-gate price so a producer only pays \$2.60/t, matched by government contributions, to support grains R&D yet pays up to \$2.85 for dust and shrinkage. So the cost of the dust and shrinkage borne by producers and supply chain participants is a greater cost to the industry than its R&D contributions.

Table 8 Shrinkage and dust deductions for wheat for 2013–14

Wheat 2013-14	CBH*	GrainCorp	Viterra	Emerald	Cargill
	(%)				
Shrinkage					
At receival site	0.5	0.7	0.6	0.6	0.7
At port (ex third-party receival site)	-	0.25	0.25	0.3	n/a
At port (ex port owner site)	-	0.25	0	0	n/a
Dust					
Dust at port	0.25	n/a	0.1%	0.1	n/a

* This is the shrinkage cost CBH indicated they charge.

Source: Company reports

⁴ Industry source

Shipping slot allocation

SA and WA — Vittera and CBH operate an auction system whereby exporters 'bid' for shipping capacity at certain times. The premiums are pooled, averaged and the 'average premium' is rebated back to exporters based on the volume shipped. Exporters are only entitled to the full rebate if they ship their commitments.

Eastern Australia — GrainCorp operates a first-in first-served system, with no auction premium, and also has recently introduced medium-term agreements. Under these agreements exporters have a committed shipping capacity spread over the year. Table 9 lists the exporters that have signed up to medium-term agreements and the capacity commitments. Excluding GrainCorp (as they do not incur penalties) 1.9 MMT of shipping capacity has been pre-committed under these agreements by exporters, equivalent to around 20% of the east coast average export volume.

Table 9 Medium-term capacity (three years) at GrainCorp's port facilities booked by customers

Customer	Medium term allocated capacity (t)
GrainCorp	1,920,000
Vittera	573,000
Emerald Grain	360,000
Alfred C. Toepfer International (Australia)	360,000
Noble Resources	273,000
Pentag Nidera	180,000
Queensland Cotton Corporation	150,000

Source: GrainCorp 2013

Shipping slot auction system and farm gate returns — Shipping slot auction premiums do not seem to be adversely impacting farm gate returns. In fact WA producers in the Kwinana zone have been receiving higher prices compared with other port zones at certain times as exporters have booked Kwinana shipping slots at significant premiums and supply started to run short. For example, if an exporter paid a \$20/t premium for a slot, they were prepared to bid up the price by up to \$20/t to fill the last portion of the ship. Otherwise, they lost the premium paid across the whole shipment volume, which would be \$800,000 on a 40,000t vessel.

Lack of secondary markets — The shipping stem allocation systems in all regions are not currently designed to allow the grain traders to buy and sell slots on a secondary market. This increases risk to traders as they purchase shipping stem commitments with uncertainty regarding available grain. This can impact on local grain prices once grain volumes are realised where traders increase their bids to ensure they have the volume available to fill commitments. Without sufficient volume the traders face penalties in not utilising purchased shipping stem capacity. This increased risk and potential penalties can deter new grain marketers to enter, and thereby compete against other grain marketers, to buy Australian grain.

Shipping

Competitive advantage

Australia does not have significant shipping freight cost advantages over the west coast of North America into North Asia. Sea transit time to Japan, China and South Korea are similar from Australia, the US (west) and Canada (west). It takes 14–17 days transit time for a bulk carrier to travel at 12 knots from Australia to the northern Asian countries of Japan, China (Shanghai) and South Korea. Similarly, transit time is 15–17.5 days from the west coasts of the US and Canada to these destinations. This time excludes days waiting and loading in port. Sea transit times are summarised in Table 10.

Table 10 Sea transit time travelling at 12 knots

	Australia Pt Kembla, NSW	Australia Kwinana, WA	Canada Vancouver	US (Portland)	US Gulf Destrehan	Ukraine Nikolayev
	(days)					
Indonesia (Jakarta)	13.4	6.4	25.1	25.7	40.8	22.2
Japan (Tokyo)	15.8	15.8	14.6	15.2	32.1	31.5
South Korea (Seoul)	16.9	15.2	16.9	17.5	34.4	30.3
China (Shanghai)	16.3	14.0	17.5	17.5	34.4	29.2

Source: www.searates.com/reference/portdistance/

Given the similar sea transit times illustrated in Table 10, it is not surprising to find freight rates to these destinations are also similar. Table 11 highlights that shipping costs from eastern Australia to the northern Asian markets, namely Japan, China and South Korea, are US\$21–22/t. These rates are commensurate to shipping rates from the west coasts of the US and Canada, US\$21–25/t. Shipping costs from Australia are only about US\$2/t lower than rates from the west coasts of the US and Canada. Typically grain from WA has a small freight advantage over grain from eastern Australia into these markets, but it is generally less than US\$5/t.

Table 11 Estimated international shipping rates to Asian markets

Destination	Australia (East coast)	Australia (WA*)	Canada (West)	US (PNW)	US Gulf	Ukraine*
	(US\$/t)					
Japan	22	25	23	25	45	30
China	21	19	22	23	44	43
Indonesia	16	9	31	31	42	41
South Korea	23	21	23	24	45	40

* Estimated based on transit time @\$1.60/t/day

Sources: International Grains Council (31/8/13), Canadian Grain Commission (31/7/12); USDA Grain Transportation report (31/8/13), US Wheat Associates Report (6/9/2013)

However, Australia does have a significant freight advantage over the US Gulf and Ukraine into North Asia. Sea freight distances and transit times from the US Gulf and Ukraine to North Asia (Japan, China and South Korea) are double the transit time from Australia. As a result freight rates from the US Gulf to North Asia are in the order of US\$23/t higher than rates from Australia. This additional cost explains why little US Gulf grain exports are destined for Asia.

Australia does have an internationally competitive shipping advantage into south-east Asia (Indonesia, Malaysia, Thailand, Vietnam). The sea transit time to Indonesia is 6.5 days from WA and 13.5 days from NSW. This equates to 25–50% of the transit time from the US, Canadian and Ukrainian ports to Indonesia. As a result Australian freight rates are a third to half those from the Americas, translating into a freight advantage of about US\$15–22/t.

Baltic Dry index (BDI)

Shipping rates are a function of available vessels and the level of trade activity which is often reflected in the BDI. The Baltic Dry Index (BDI) is low but trending up.

The BDI during the past five years (see Figure 14) highlights that while it has recently trended up to 1500 from 661 it is still well below the rates experienced during 2009–10 when it range-traded between 2500 and 4500 points. Note the index reached a record high of 11,793 points during May 2008, just before the global financial crisis.

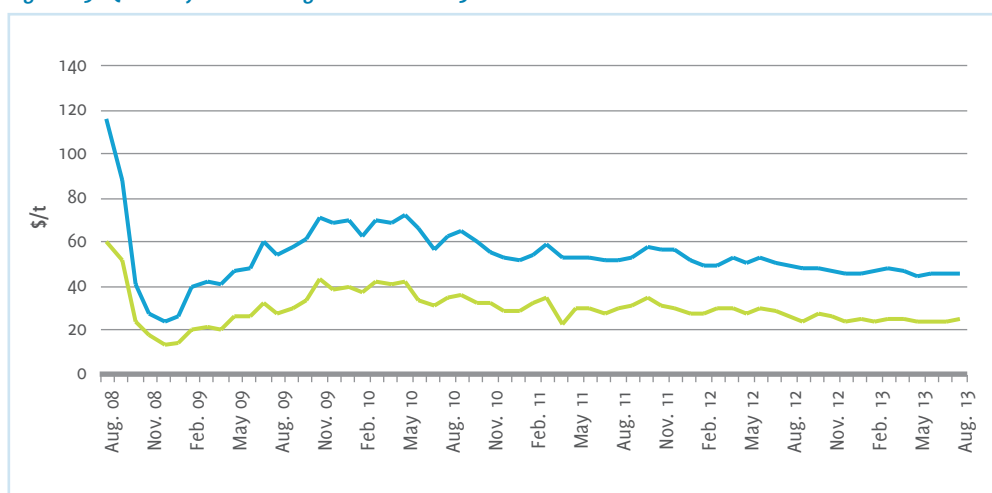
Figure 14 Baltic Dry Index – 2009–13



Source: Bloomberg

Shipping rates continue to remain low as the oversupply of vessels since the global financial crisis continues (see Figure 14). When the BDI was 3000–4000 points in mid-2010, the shipping rate to Japan was US\$70/t from US Gulf and US\$40/t from US Pacific North-west (see Figure 15). This equates to a \$25/t and US\$15/t premium respectively to current rates. If the upward trend in the global trade and BDI continues rates and therefore spread, will also rise.

Figure 15 Quarterly Ocean Freight rates 2008–13



Source: USDA Grain Transportation report



Other costs

GRDC levy

The GRDC levy is a statutory levy set at 1.02% of farm-gate value — the sale value less storage, handling, freight and FOB costs. Because the levy is paid on the farm-gate value of grain, producers' costs of transporting grain from the farm to the receival point are also deducted from the grain revenue; and the levy is only applied to the remaining value. Effectively this means that farms closer to ports and receival bins, and those that use less costly receival points pay slightly more per tonne in levy payments. That is, although the percentage payment remains equivalent across all producers at 1.02% of farm-gate value, some producers pay more in absolute dollar terms as their farm-gate price is higher.

Across regions and States this also means where supply chains costs are lower, those producers pay higher GRDC levies (in absolute dollar terms) if they are receiving the same FIS price.

Basing the levy on a farm-gate price ensures producers selling to the domestic market pay similar amounts to exporting producers.

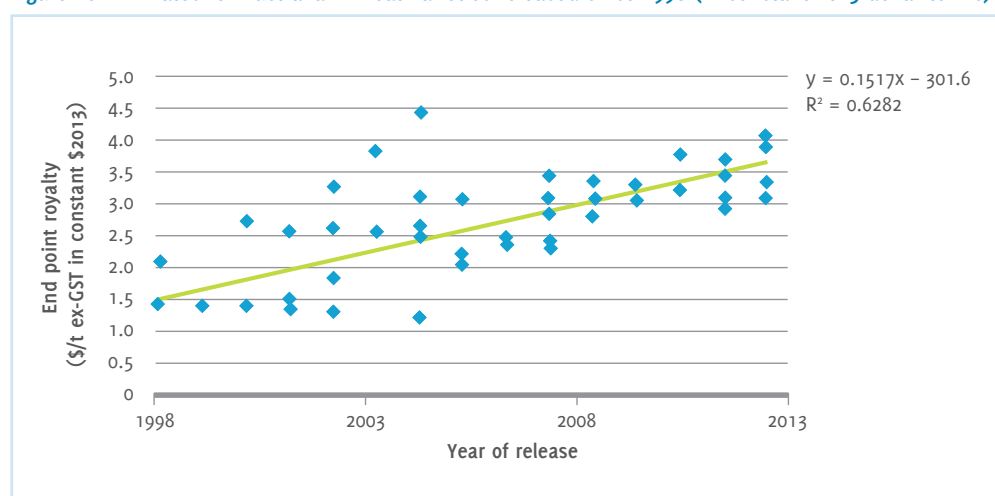
End point royalties

End point royalties (EPRs) for wheat will vary from \$0.95–\$4/t for the 2013–14 harvest depending on the variety. A full list of EPRs for each variety can be found at the website varietycentral.com.au/varieties-and-rates/2013-harvest/wheat.

EPRs are paid to the providers of new varieties on a flat rate rather than *ad valorem* basis. This means producers capture more of the upside when grain prices spike. However, since their introduction during the late 1990s, EPRs have increased in real terms (see Figure 16). This implies that EPR rates have increased at a greater rate than general inflation.

Grain producers are required to pay the full cost of varietal development. Before the introduction of EPRs, State agricultural agencies, in collaboration with universities and the CSIRO, developed and tested new varieties. Funding restrictions combined with changed priorities and policies of governments in the 1980s and 1990s led to the greater privatisation of plant breeding services in Australia. State agricultural agencies gradually withdrew from varietal development of major grains, such as wheat, barley and canola. Consequently producers now need to pay for their use of privately-bred varieties. Before the introduction of EPRs, producers principally captured varieties' yield and quality benefits. Now those benefits are shared with varietal developers through EPRs.

Figure 16 EPR rates for Australian wheat varieties released since 1998 (in constant 2013 dollar terms)



Source: GRDC 2013

Biosecurity

Quarantine inspection fees at Australian ports can be as high as \$0.25/t although the service component of this inspection fee is set by the Federal Government at \$0.11/t. Service fees in WA and SA are included in the vessel loading fee. The basis for GrainCorp and Emerald charging higher fees for inspection services is not clear.

State levies

WA – BAMA levy (\$0.30/t)

The *Biosecurity and Agricultural Management Act* (BAMA) contribution is a WA government levy applied to all grain delivered to CBH, which is usually collected by acquirers. Under the Act the Grains/Seed/Hay Industry Management Committee has determined that a 30 cent contribution will apply on the first sale of every tonne of grain and seed within the agricultural areas of WA in 2011–12, to fund continuing programs for the control of skeleton weed and the eradication of three-horned bedstraw⁵.

WA – COGGO voluntary levy (0.5% net farm gate grain production returns)

The Council of Grain Growers Organisations Ltd (COGGO) was established during 1997 when 10 Western Australian grain producer organisations joined together to support plant breeding. They offer voluntary membership to the organisation for a levy of 0.5% of net farm gate returns.

SA – Grain Research and Development Fund voluntary levy (\$0.30/t)

The Grain Research and Development Fund is used by the South Australian Grain Industry Trust (SAGIT) for research into growing, harvesting, storage, processing and marketing of grain. More information is available on the SAGIT website⁶.

SA – Grain Industry Fund levy (\$0.20/t)

The Grain Industry Fund provides funding for projects and services to the grains industry in accordance with the Grain Industry Fund management plan. See the PIRSA website for further information⁷.

Eastern Australia

No mandatory state export levies appear to be imposed on producers in Qld, NSW or Vic.

⁵ www.agric.wa.gov.au/objtwr/imported_assets/content/pw/ifs_flyer_july.pdf

⁶ www.sagit.com.au

⁷ www.pir.sa.gov.au/grains/grain_industry_funds



Rebates and discounts

Western Australia

As a co-operative CBH is eligible for tax concession and does not pay dividends to its members. Rather it provides members with lower supply chain costs and distributes profits in the form of rebates. CBH offers the following rebates.

Marketing and trading rebate (formerly producer loyalty rebate) — Introduced during 2010 the marketing and trading rebate is calculated on the tonnes a producer sells to CBH's marketing and trading arm between 1 October and 30 September. The value of the rebate depends on CBH's financial performance. In 2013–14 the rebate for grain sold to CBH between 1 October 2012 and 30 September 2013 was \$1 per tonne and was provided as an offset against receival fees.

Investment rebate — The investment rebate is a new rebate introduced during 2013, made possible by the return on investments CBH made in the Interflour mills in Indonesia, Malaysia and Vietnam. Producers receive a per-tonne rebate credited against each tonne they deliver to CBH in the upcoming season. The value of the rebate is determined each September, when CBH has a better idea of expected receivals. Similar to the marketing and trading rebate, the investment rebate is dependent on CBH's financial performance. For the 2013–14 harvest the rebate was \$0.75 per tonne.

In addition, in 2013–14 a one-off rebate of \$0.85/t was provided due to a favourable State tax ruling that recognises the contribution CBH makes as a co-operative to the development of the Australian agricultural industry. As this is a one-off rebate it has been excluded it from the analysis.

COGGO dividends — During July, 2012 a dividend of \$3 million was paid to COGGO members and a further dividend of \$340,000 was paid to COGGO members on 30 April 2013.

South Australia

Viterra provides its commercial customers with storage, handling and transportation options, including a bundled supply chain system called Export Select. Export Select moves grain from up-country receival sites to port for shipping. Transport rates are fixed at the time of transfer into the export select system. The Export Standard system debundles the handling and freight components and allows grain traders to organise their own transport from bin to port.

The rebate for customers using Export Select for 2013–14 was \$1.10/t, down from \$2.20/t during 2012–13.

Eastern Australia

There are no rebates offered to producers in eastern Australia. However, there are additional charges if delivering grain to a GrainCorp port terminal from a non-GrainCorp receival site. During 2012–13 the intake free from a third party was \$9.52 compared with \$7.90/t from a GrainCorp storage. This \$1.62/t spread increased to \$1.85/t during 2013–14, with the exception of Geelong and Portland where there is no surcharge for grain coming from a third party.

Australian supply chain costs for 2013–14

This chapter presents a breakdown of base fees along the supply chain for a grain producer during 2013–14 assuming:

- delivering wheat to a site 200 km from port
- FOB price of \$320/t used across all terminals
- calculated FIS price used to determine shrink, dust and GRDC levy
- storing at the receival site for three months
- no special requests
- no auction premium for the shipping slot
- a \$3/t EPR

Under the scenario outlined in Figure 17 and Table 13 WA has the lowest cost supply chain for producers at \$58.93/t (net of recurring rebates). The highest cost supply chain is in Qld where post-farm- gate costs are at least \$72.64/t. This implies Qld producers 200 km from port are typically paying at least \$14/t, or 25% more in supply chain costs than WA producers located the same distance from port.

The storage period of three months has been chosen as a lower bound of the expected time grain resides in the storage system. While a standard 200 km distance has been used in this analysis for reasons of keeping a standardised comparison, there must be consideration that the median distance to port is different in each region. Incorporating a different distance will affect the freight component, with the expected freight charges presented for different distance in Table 12.

Table 12 Freight charges by distance for regions

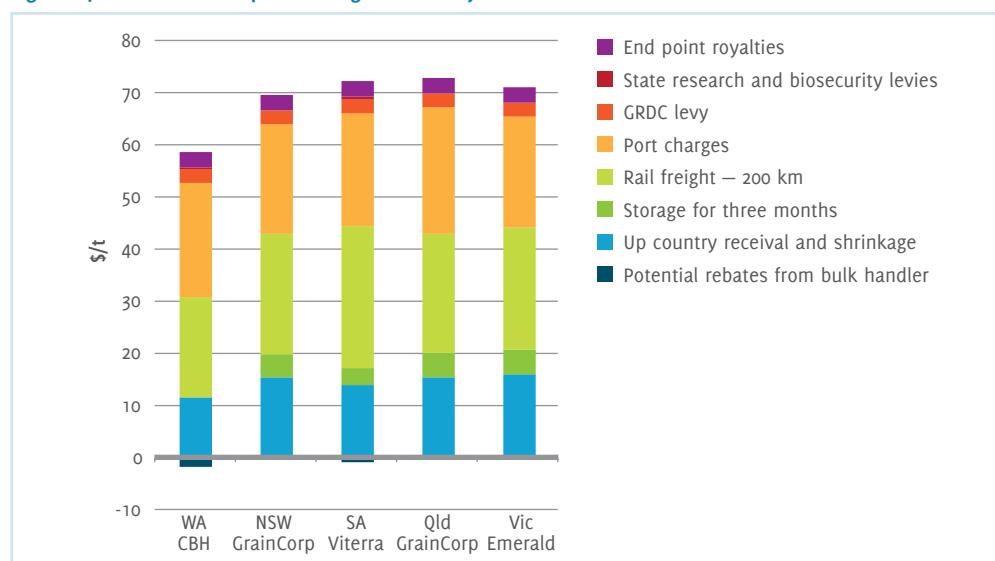
Distance from bin to port	100 km (± 10km)	200 km (± 10km)	300 km (± 20km)	400 km (± 20km)
SA				
\$/t	15.6	27.5	29.6	-
\$/t/km	0.16	0.14	0.10	-
WA				
\$/t	10.2	19.3	24.3	-
\$/t/km	0.10	0.10	0.08	-
Qld, NSW, Vic				
\$/t	14.5	22.7	31.0	39.3
\$/t/km	0.14	0.11	0.10	0.10

Source: AEGIC 2013

When comparing CBH and the other corporates, the company structure needs to be taken into account. As a co-operative CBH has tax exemption status (parent entity only) and does not pay dividends, so it can re-invest more cash back into the business. By comparison GrainCorp pays tax at the 30% company tax rate and pays out 60% profit as dividends to shareholders.



Figure 17 Breakdown of post-farm-gate costs by State



Source: AEGIC 2013

Note any rebates are shown as negative values (i.e. below the line).

Table 13 Breakdown of post gate costs by State

2013/14	WA – CBH	NSW – GrainCorp	SA – Viterra	Qld – GrainCorp	Vic – Emerald
	(\$/t)				
FOB price (assume same at all ports)	320	320	320	320	320
Port charges	21.90	20.99	21.78	24.11	21.11
FIS price	298.10	299.01	298.23	295.89	298.89
Up country receival and shrinkage	11.49	15.18	13.64	15.39	15.85
Storage for three months	-	4.50	3.30	4.50	4.80
Rail freight – 200 km	19.00	23.00	27.20	23.00	23.40
GRDC levy	2.73	2.71	2.59	2.64	2.64
State research and biosecurity levies	0.30	-	0.50	-	-
End point royalties	3.00	3.00	3.00	3.00	3.00
Other					
Total supply chain cost before rebates	58.42	69.38	72.01	72.64	70.80
Potential rebates from bulk handler	-1.75	-	-1.10	-	-
Supply chain cost after rebates	56.67	69.38	70.91	72.64	70.80
Farm gate price	263.33	250.62	249.09	247.36	249.20

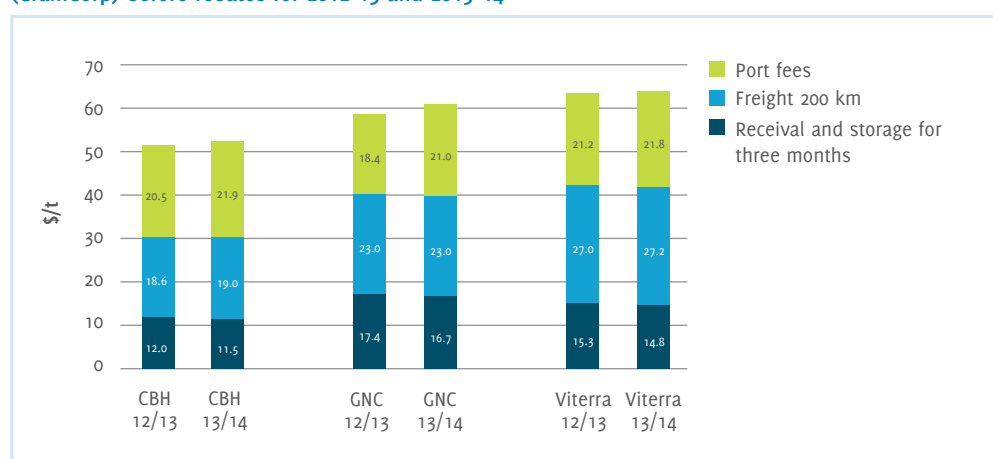
Source: AEGIC 2013

Changes in supply chain costs for 2013–14

Figure 18 highlights how supply chain fees and charges by the major bulk handling companies changed for producers 200 km from port during 2013–14 relative to 2012–13.

Storage and ports — Price increases for the 2013–14 season for storage and ports were -0.06% in NSW, 0.2% in SA and 2.7% in WA. The price increases vary between storage and ports. For example, during 2013–14 CBH decreased the receival charges by 4% but increased base port fees by 6.8%. GrainCorp and Viterra decreased receival fees by 3.6–4.2% and base port fees by 2.6–3% for the 2013–14 season.

Figure 18 Receival, storage for three months, freight and port costs combined for WA (CBH), SA (Viterra) and NSW (GrainCorp) before rebates for 2012–13 and 2013–14



Note: GrainCorp (GNC) does not publish freight rates. Therefore, GTA freight differentials have been used as an estimate for GNC freight costs. These did not change for the 2013–14 season. Rebates have been excluded.

Source: AEGIC 2013

Freight — GrainCorp does not publish freight rates. Therefore, GTA freight differentials have been used as an estimate for GNC freight costs. The GTA freight differentials have not changed for the past 3–4 years. CBH and Viterra publish freight rates. There was minimal change in CBH freight rates between 2010–11 and 2011–12. CBH freight rates fell in the order of 7% during 2012–13 following the investment in rolling stock and then increased 2% for 2013–14. Viterra freight rates decreased by 3.4% on average for 2013–14. For detail on change in freight rates by Viterra and CBH see Table 4.

Overall, including freight assumptions, CBH fees rose the most, by 2.5%, compared with 2.1–2.3% increases in other States. However, CBH remains the lowest cost supply chain.

- In 2013–14 CBH receival fees fell by 4% while freight rates increased by 2% and port fees rose by 7%.
- In 2013–14 Viterra's receival fees decreased by 4% while freight rates decreased by 3.4% and port fees rose by 3%.
- In 2013–14 GrainCorp's receival fees and basic port fees decreased by 4.8% and increased by 2.6% respectively.



Appendix 1: Log of changes to this report

Version	Date	Changes	Acknowledgements
2013.1	31/01/2014	Initial Version	
2014.2	3/02/2014	Port costs (page 24)	Emerald Grain
2014.3	27/02/2014	Table 3 (page 17)	



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