

**Essential Services
Commission of South
Australia (ESCOSA)**

Final Report
Port Price Benchmarking

April 2012

Table of Contents

Executive Summary	1
1. Introduction	3
1.1 Background	3
1.2 Report structure	5
2. Methodology	6
2.1 Background	6
2.2 Approach used	6
3. Data and inputs	11
3.1 Commodities	11
3.2 Ports coverage	11
3.3 Data collection process	11
3.4 Charges coverage	12
3.5 Specifications of model vessels	14
3.6 Assumptions and limitations	16
4. Comparison of port charges by commodity group	18
4.1 Grain	18
4.2 Dry bulk - general	21
4.3 Dry bulk – concession	23
4.4 Liquid bulk	24
4.5 Motor vehicles	25
4.6 Containers	27
4.7 Livestock	28
5. Comparison of overall port prices	30
5.1 Overall price comparison	30
5.2 Changes over time	38
6. Conclusions	43

Table Index

Table 1: Commodity (cargo) group shares in SA and non-SA ports, 20118	
Table 2: Overview of EMS charges for the comparator ports, 2011	13

Table 3: Specifications of Grain Handymax and Panamax model ships	14
Table 4: Specifications of dry bulk – concession and general model ships	15
Table 5: Specifications of the model ships for other commodity sectors	16
Table 6: Conversion factors used in assigning weights	30
Table 7: Non-South Australia comparators: Revenue tonnes by port and commodity group, 2011 (000's)	31
Table 8: South Australian proclaimed ports: Revenue tonnes by port and commodity group, 2011 (000's)	31
Table 9: EMS charges per revenue tonne for each model ship visit (2011 charges)	32
Table 10: Total charges per revenue tonne for each model ship visit (2011 charges)	33
Table 11: Summary measures of relative prices, 2011	36
Table 12: Changes in EMS charges from 2006 to 2011	39
Table 13: Changes in Total Charges from 2006 to 2011	39

Figure Index

Figure 1: Level and changes in EMS port charges from 2006 to 2011, SA and non SA ports	2
Figure 2: Trade commodity composition by port, 2011	7
Figure 3: Approach to estimating overall price levels indicator	9
Figure 4: Grain-Handymax vessel ship visit costs - total, 2011	18
Figure 5: Grain-Handymax vessel ship visit costs - detail, 2011	19
Figure 6: Grain-Handymax vessel ship visit costs - detail, 2011 (excluding grain levy at Port Adelaide)	20
Figure 7: Grain-Panamax vessel ship visit costs - total, 2011	21
Figure 8: Grain-Panamax vessel ship visit costs - detail, 2011	21
Figure 9: Dry bulk-general vessel ship visit costs - total, 2011	22
Figure 10: Dry bulk-general vessel ship visit costs - detail, 2011	22
Figure 11: Dry bulk-concession vessel ship visit costs - total, 2011	23
Figure 12: Dry bulk-concession vessel ship visit costs - detail, 2011	24
Figure 13: Liquid bulk vessel ship visit costs - total, 2011	25
Figure 14: Liquid bulk vessel ship visit costs - detail, 2011	25
Figure 15: Motor vehicle ship visit costs - total, 2011	26
Figure 16: Motor vehicle ship visit costs - detail, 2011	27
Figure 17: Container ship visit costs - total, 2011	28
Figure 18: Container ship visit costs - detail, 2011	28
Figure 19: Livestock ship visit costs - total, 2011	29

Figure 20: Livestock ship visit costs - detail, 2011	29
Figure 21: Average EMS charges per revenue tonne of cargo loaded/discharged for various ship models, 2011	34
Figure 22: Average total charges per revenue tonne of cargo loaded/discharged for various ship models, 2011	35
Figure 23: Comparison of weighted average charges for individual ports (\$/revenue tonne, 2011)	37
Figure 24: Increases in EMS charges by cargo sector, 2006 to 2011	41
Figure 25: Selected cargo shares of total trade across SA and non SA ports, 2011	41
Figure 26: Level and changes in EMS port charges from 2006 to 2011, SA and non SA ports	43

Appendices

- A Factors affecting port price levels
- B Computing overall price indicators
- C List of data sources used

Executive Summary

GHD has been engaged by the Essential Services Commission of South Australia (ESCOSA) - the economic regulator of certain South Australian (SA) ports - to undertake a comprehensive benchmarking study of port prices (or ship visit costs or charges) at SA ports against comparable interstate (or non SA) port prices.

The findings and insights from this study are intended to feed into ESCOSA's deliberations on the reasonableness of annual port price increases at the 'proclaimed' SA ports of Adelaide, Port Giles, Port Pirie, Port Lincoln, Wallaroo and Thevenard. This is part of the 2012 Ports Access and Pricing Review in accordance with work tasks under the Maritime Services (Access Act) 2000 (the MSA Act). The current Ports Price Determination expires on 30 October 2012.

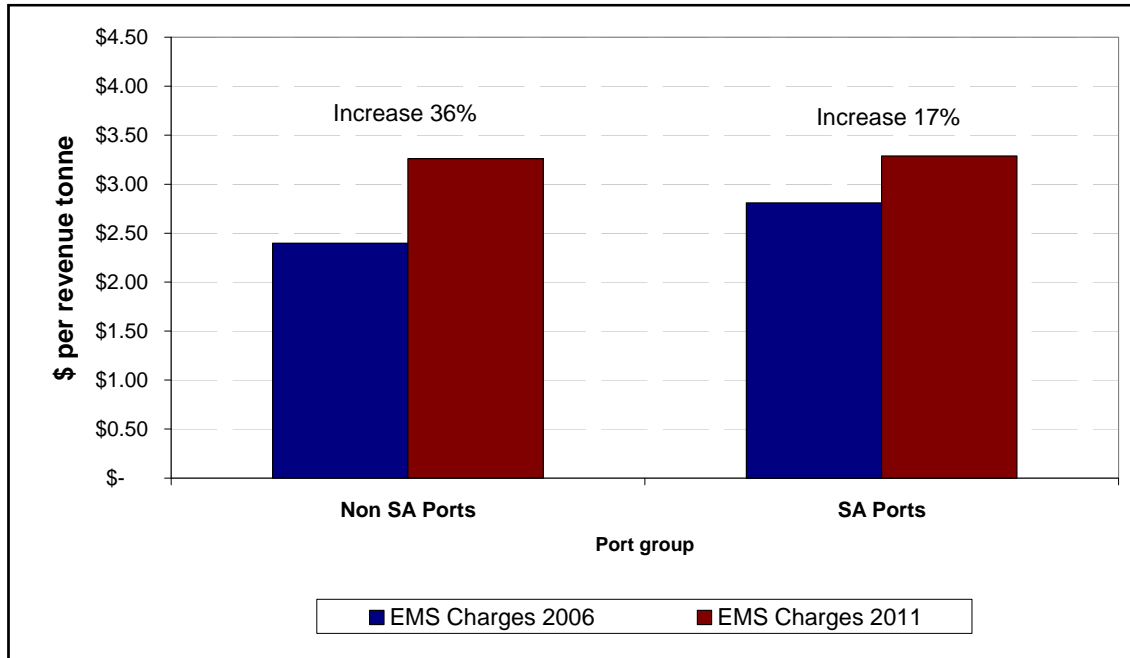
This study utilises the same benchmarking data methods, assumptions and framework which was used by Meyrick and Associates to undertake the 2007 port price benchmarking study. It seeks to not only update the previous study but to also provide some insights into the factors/drivers that are likely to explain the differences between the levels of SA and non SA port prices and how they have changed over time.

There are two important findings to come out of this 2012 benchmarking study of SA port charges against those of 12 non SA ports.

The first finding is that SA port prices were moderately higher than non SA port prices in 2011. Over seven commodity cargo groups, weighted average SA total port prices were 3.4% higher than weighted average total non SA port prices. On an EMS charges basis, SA port prices were marginally (around 1%) higher than non SA port prices in 2011. While SA port prices are slightly higher than average they are within the reasonable range as inferred from the spread of prices charged at other Australian ports. The reasons for port prices being higher at SA ports are likely to be lower economies of scale relative to certain non SA ports, challenges posed by operating a number of remote regional SA ports that have narrower trade bases and stronger rate of return considerations at SA ports.

The second finding is the analysis indicates a substantial narrowing of the gap between SA and non SA total port prices over the five year period from 2006 to 2011. On an EMS charges basis, SA total port prices were around 17% higher than non SA port prices. This differential narrowed to only 1% in 2011. This is highlighted by Figure 1, which shows non SA port prices increasing by 36% over the five year period, while SA port prices only increased by 17% (or at around the same rate of general inflation) over the same period. The significant reduction in the SA port price premium over non SA port prices over the past five years is likely to be attributable to the impact of stronger trade volume growth at non SA ports compared to that experienced at SA ports. This has required a greater degree of capital expenditure at non SA ports relative to SA ports, which in turn, is likely to have translated into greater increases in port charges (in order to recover the capital expenditure) at non SA ports compared to SA ports.

Figure 1: Level and changes in EMS port charges from 2006 to 2011, SA and non SA ports



In summary, the benchmarking results indicate that the combination of market pressures and current regulatory arrangements appears to have been effective in protecting the interests of South Australian port users. There is no evidence of excessive price increases at SA ports.

1. Introduction

1.1 Background

GHD Strategy and Economics has been engaged by the Essential Services Commission of South Australia (ESCOSA) - the economic regulator of certain South Australian (SA) ports - to undertake a comprehensive benchmarking study of port prices (or ship visit costs or charges) at SA ports against comparable interstate (or non SA) port prices.

The findings and insights from this study are intended to inform the 2012 Ports Access and Pricing Review in accordance with work tasks under the *Maritime Services (Access Act) 2000* (the MSA Act). The current Ports Price Determination expires on 30 October 2012.

ESCOSA has been responsible for the economic regulation of certain SA ports since September 2002. The MSA Act covers the common user terminals (“proclaimed ports”) at Port Adelaide, Port Giles, Port Pirie, Port Lincoln, Wallaroo, Thevenard, and until recently, Ardrossan. The proclaimed ports are all privately operated by Flinders Ports Pty Ltd.

Price regulation under the MSA Act applies to a set of port services known as “Essential Maritime Services” (EMS). These are defined in Section 4 of the MSA Act, and consist of:

- ▶ Providing or allowing for access of vessels to a proclaimed port; or
- ▶ Providing port facilities for loading or unloading vessels at a proclaimed port; or
- ▶ Providing berths for vessels at a proclaimed port.

Currently, the three port charges that cover these EMS are:

- ▶ Navigation services charges;
- ▶ Harbour services and mooring charges; and
- ▶ Cargo services charges.

Section 9 of the MSA Act requires that ESCOSA keeps the above mentioned EMS charges under review to determine whether regulation should continue, and if so whether current forms of regulation are appropriate. To this end, ESCOSA issued a Ports Price Determination in November 2007, which provides for a relatively light handed form of price regulation. This allows a port operator to set its own prices for EMS but within the context of having ESCOSA monitoring these prices and publicly reporting on them.

1.1.1 Change to port price monitoring approach

It is worth noting the price monitoring approach of ESCOSA has changed over recent years. The Commission’s approach up to and including the 2007-08 regulatory year was based on a detailed benchmarking process that compared SA port prices with those at nominated interstate ports. In order to obtain consistency comparisons, the benchmarking process normalised port costs across different ports by applying parameters for representative (or notional) ship sizes and loading rates across ports. While providing useful comparative insights, the Commission acknowledged that a benchmarking approach provided limited

guidance and evidence of excessive pricing and whether or not market power has been misused by a port operator.

Given this, the Commission developed a different price monitoring approach. Starting in the 2008-09 regulatory year, the Commission has since monitored the prices of EMS by focussing on trends in prices as opposed to seeking to benchmark SA port prices against interstate ports. Under this approach, the emphasis is how SA port prices move in relation to the general rate of price inflation {as measured by the Consumer Price Index (CPI)}. In instances where SA port price levels for EMS have increased by more than CPI the Commission asks the port operator (Flinders Ports) to provide justification for these above-CPI increases in port prices. A justification could include port prices having to increase at an above-CPI rate to cover the full costs of new capital spending on berth infrastructure or channel deepening works. Based on the justifications provided by the port operator, the Commission subsequently comments on the overall reasonableness of real increases in port prices. These comments are contained in the Commission's annual price monitoring reports.

While this new price monitoring approach has been adopted, the Commission notes that this does not prevent it from undertaking a detailed port price benchmarking analysis as part of its annual port price monitoring regime. This is where this particular study fits into the broader regime.

1.1.2 This study compared to the previous one

This benchmarking study is essentially an update of the 2007 port price benchmarking study, which was undertaken by Meyrick and Associates for ESCOSA. Meyrick and Associates is now part of GHD as the Strategy and Economics group.

This benchmarking study utilises the same methodology from the 2007 study. This provides several advantages including:

- ▶ Consistency in terms of comparisons and trends over time, i.e. 2011 price information can be meaningfully compared with the previously gathered and analysed 2006 price information; and
- ▶ Previous acceptance of the methodology by the various stakeholders involved in the 2007 Ports Access and Pricing Review process.

However, a number of data elements have changed since the 2007 study was undertaken. These include:

- ▶ Ardrossan is no longer a 'proclaimed' port for regulatory purposes. This means the number of SA 'proclaimed' ports has moved from seven to six for this study;
- ▶ One additional interstate port, Fremantle, has been added to the analysis. During the late January study inception meeting, it was agreed that Fremantle would be included to offset for Ardrossan falling out of the analysis. This gives 12 interstate comparator ports for this study compared with 11 interstate comparator ports in the previous 2007 study; and
- ▶ New or modified port tariffs in a number of Australia ports used for comparison. It is not unusual for the structure and coverage of port tariff schedules of SA and interstate ports

to change over time. As ports expand and tailor their infrastructure assets in response to changes in trade volume mix and operating environments, so too does the coverage of port tariff schedules (i.e. introduction of new charges, amalgamating different charges, abolishing charges that are no longer relevant). The extent of changes to port tariff schedules since the 2007 study are relatively small. As such, the changes resulted in some modifications to the analysis model used for the study, but the underlying approach to the benchmarking work has remained the same as that used in 2007.

The study reports on the same two categories of port charges or prices:

- ▶ EMS charges, i.e. those port charges currently covered by price regulation by ESCOSA, which are navigation services charges, harbour services and mooring charges, cargo services charges; and
- ▶ Non EMS charges, which covers pilotage, towage and conservancy charges.

The aspects in which the approach and coverage of this study is the same as the previous study include:

- ▶ the range of commodities includes dry bulk (grain and other dry bulk), liquid bulk, containers, motor vehicles and livestock commodities;
- ▶ a consolidated index has been constructed as a single indicator of how the overall level of prices in SA ports compares with the overall level of prices in interstate ports; and
- ▶ a similar index is used to track how SA port charges have changed over time (i.e. from 2006 to 2011) compared with changes in prices at interstate ports

1.2 Report structure

The structure of this report comprises the following sections:

- ▶ *Section 2 Methodology* – outlines the benchmarking approach used to estimate commodity group and overall price levels for SA and interstate ports. This is done with reference to the current trade commodity group mix at SA and interstate ports;
- ▶ *Section 3 Data and inputs* – presents the commodity groups, ports, EMS and non-EMS charges covered by the study, vessel size and loading rate assumptions required to undertake benchmarking and approaching to filling data gaps;
- ▶ *Section 4 Comparison of port charges by commodity cargo group* – outlines and compares port charges for SA and interstate ports by commodity group. Charges are broken down into the monitored (EMS) charges and non-monitored (non-EMS) charges;
- ▶ *Section 5 Comparison of overall port prices* – presents and compares a single weighted average measure of 2011 charges for SA and interstate ports, extent of increases in port charges between 2006 and 2011 for SA ports relative to interstate ports and the reasons explaining relative increases in port charges; and
- ▶ *Section 6 Conclusions* – summarises the key results of the benchmarking analysis and makes concluding observations about what the reasonableness of port charges at SA ports relative to interstate ports.

2. Methodology

2.1 Background

There are many complex factors that affect the level of comparative port prices; not all of these factors will fall within the control of either ESCOSA or the port service providers. These factors represent challenges for port price benchmarking. Some typical (largely) uncontrollable factors affecting the level of port costs are:

- ▶ Location;
- ▶ Scale; and
- ▶ Cargo mix.

The (largely) controllable factors are capacity utilisation and ship size. There are also factors affecting the relationship between the overall level of port prices and port costs concerning asset valuation policies and rates of return. Furthermore, there are factors affecting port charges incurred by specific port users, i.e. cost/profit centre structuring, cost allocation procedures and price structures.

Further explanation of the various factors outlined above is contained in Appendix A.

2.2 Approach used

To accommodate the challenges of meaningful port price benchmarking presented by the interaction of numerous complex factors, a four-staged approach to the study work has been used.

The four-staged approach comprises a consideration of overall price levels; a comparison of relative price levels; an assessment of the changes in price levels and the drivers behind these changes; and finally, general conclusions and inferences, which are drawn from the analysis. This four-staged approach is the same as the one adopted for the previous 2007 study and has been summarised below for ease of reference.

2.2.1 Stage 1: Benchmarking of charges for particular commodity types

The variability of charging structures and the lack of clear correspondence between specific costs and specific charges means that comparing individual elements in a port tariff is either impossible or meaningless.

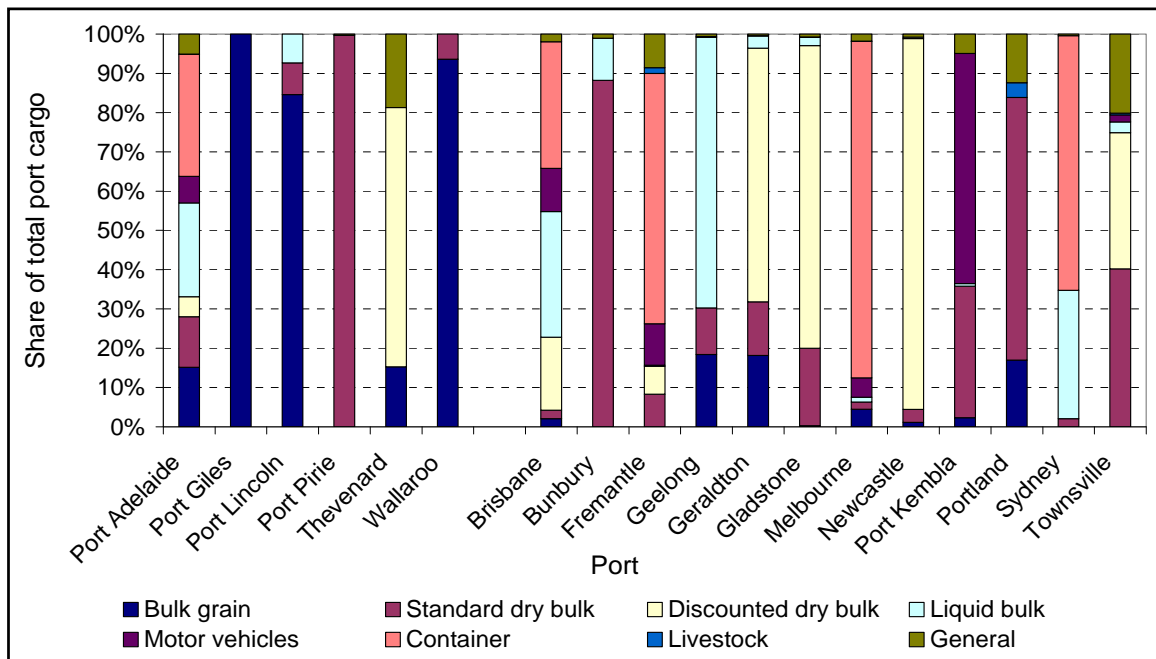
This study overcomes this problem by adopting a 'model ship' based approach, which is similar to that adopted by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) for its Port Interface Cost Index. This is used in BITRE's Waterline publications. However, unlike BITRE, this study uses a 'fixed cargo exchange' approach for each model ship to allow "like-with-like" comparisons when analysing port costs.

2.2.2 Stage 2: Benchmarking of overall port prices

The second stage of the analysis involves developing a single overall metric of 2011 price levels for the proclaimed SA ports as a whole and for the comparator interstate ports.

This would be straightforward if the composition of the trade was the same in each port. However, this is not the case when we compare individual ports, nor when SA ports as a group are compared with non-SA ports – see Figure 2.

Figure 2: Trade commodity composition by port, 2011



Source: Various port authority websites, Ports Australia

The approach in the benchmarking study is to use the actual shares of each commodity group (corresponding to the assumed model ship types) in the total SA trade and in the trade through the non-SA ports for 2011 as shown in Table 1.

Table 1 shows there is a considerable difference in the cargo composition between the two groups of ports. In particular, grain, which is a very important part of the total cargo base for South Australian ports, is a relatively small component of the cargo task outside of South Australia.

It is worth noting that the approach using commodity shares for a single year (i.e. 2011) is the same as the accepted approach in the previous 2007 study (i.e. using 2006 commodity shares). This is critical in that it allows an accurate 'like with like' comparison to be made for movements in port charges between 2011 and 2006.

One commodity group where the share of total trade in any single year can be markedly different to the share over a number of years is bulk grain. For example, the grain share of SA port trade volumes was high in 2011. This was due to an exceptional grain harvest following a number of years where grain harvests (and exports were very low or below average due to prolonged drought conditions). The upshot is if the estimation of an overall port charge were to key off a 4 year average grain share of total SA port trade volumes (rather than a single year's grain share of total SA port trade volumes) then grain charges would make a smaller contribution to the overall port charge. This is because grain has a

lower weight in the overall trade mix. The same logic applies to other commodities where the share of total port trade in a single year can be significantly different to that over a number of years.

Table 1: Commodity (cargo) group shares in SA and non-SA ports, 2011

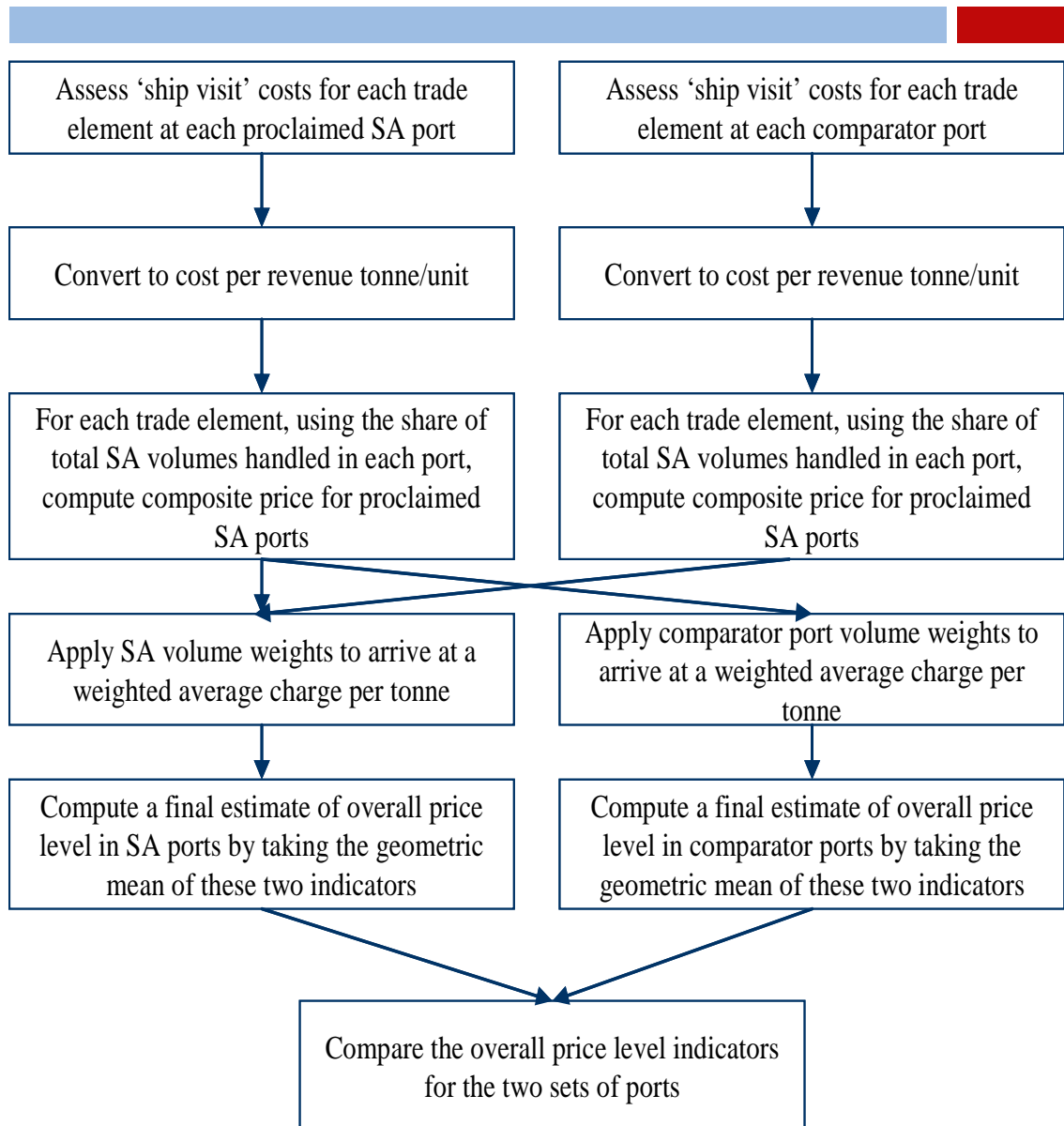
Cargo shares*	SA ports	Non-SA ports
Grain	30.0%	2.2%
Dry bulk – general	13.4%	15.0%
Dry bulk – concession	13.4%	41.7%
Liquid bulk	17.3%	9.2%
Motor vehicle	4.6%	11.0%
Container	21.3%	20.8%
Livestock	0.1%	0.1%

(*) Excludes non-containerised general cargo

Source: Various port authority websites, Ports Australia

Taking the commodity group shares into consideration allows a robust approach to be adopted with respect to estimating an overall port price indicator. This is shown diagrammatically in Figure 3. Conceptually, the approach is closely related to the computation of a Fisher ideal index that is commonly used in the analysis of time series data.

Figure 3: Approach to estimating overall price levels indicator



The main steps involved in the Figure 3 estimation process are:

- A weighted average cost per revenue tonne was estimated for SA and non-SA ports. This is done using the 2011 weights of the relative importance of different commodity groupings in trade of the non-SA ports in the sample. The weights used in this were obtained by simply adding, for each commodity group, the cargo volumes handled in each of the non-SA ports;

- ▶ This process was then repeated, using the 2011 weights of the relative importance of the different commodity groups in the trade handled in the SA ports; and
- ▶ The geometric mean of outcomes from these two estimates was taken as a 'central' estimate of relative prices.

The procedure is described mathematically in Appendix B.

This approach uses the construction of the index itself to internalise many of the uncontrollable factors affecting the level of port costs. The influence of the trade mix at the port on the comparison is minimised, as the weights used in the construction of the index take the trade mix into account. Similarly, the influence of a port's decision on how to allocate common costs between trades is minimised, since all relevant prices are included in a single measure.

A relatively common price schedule for EMS is currently in force at proclaimed SA ports, and all are managed by Flinders Ports (given Ardrossan is no-longer a proclaimed port for the purposes of the ESCOSA review). As a result, we have assumed a single composite index for the SA ports. There is little to be gained by producing separate indexes for each individual port as this is likely to obscure rather than clarify the answer to the question of how Flinders Ports' prices, taken as a whole, compare with those at interstate ports.

2.2.3 Stage 3: Further analysis based on composite indexes

The third stage of the analysis concerned the construction of further composite indexes, namely:

- ▶ *Five Year Inter-temporal analysis* – this compared the 2011 port prices with those of 2006 using the same approach described above to determine the 2006 levels (i.e. the 2011 commodity group mix has been applied to the 2006 price data), which allowed an assessment of how port prices have moved in SA ports compared with non-SA ports over the last five years.

2.2.4 Stage 4: Interpretation of the benchmarking results

The final stage of the study process consisted of interpreting the results of the benchmarking comparisons and their implications for an assessment of the effectiveness of current regulatory arrangements managed by ESCOSA.

In theory, further extensive quantitative economic analyses could be conducted to understand the reasons for the results of the benchmarking comparisons (ie, scale of operation effects for each port, cost allocations and rates of required return on capital adopted by each port, etc.). However, there is both limited data available and the time/budget of the study excludes the possibility.

Consequently, the scope of the interpretation of the benchmarking results is largely a qualitative assessment of the possible reasons for the observed differences, supported where possible by limited quantitative evidence.

3. Data and inputs

3.1 Commodities

The commodity groups covered by this study are the same as those in the 2007 study. They are as follows:

- ▶ Grain (in bulk);
- ▶ Dry bulk – general;
- ▶ Dry bulk – concession;
- ▶ Liquid bulk;
- ▶ Motor vehicles;
- ▶ Containers; and
- ▶ Livestock.

Importantly, the commodity groupings cover over 95% of the cargo passing through the selected ports with the remainder representing non-containerised general cargo. This type of cargo is by various ship types in different ways and is not clearly detailed in statistics in terms of shipment sizes and co-loading with other cargoes. As a result, this minor part of port throughput is excluded from the study analysis – this exclusion is most unlikely to materially affect the results and conclusions of the study.

3.2 Ports coverage

The ports included in the benchmarking study are grouped into SA proclaimed ports and selected non-SA ports, notably:

- ▶ *South Australian proclaimed ports* - Port Adelaide, Port Giles, Port Lincoln, Port Pirie, Thevenard and Wallaroo
- ▶ *Non-South Australian selected ports* – Brisbane, Bunbury, Fremantle, Geelong, Geraldton, Gladstone, Melbourne, Newcastle, Port Kembla, Portland, Sydney and Townsville.

The differences with the 2007 benchmarking study are that the SA port of Ardrossan is no longer a proclaimed port and so it has been dropped from the SA port group. In the 2012 benchmarking study, the non-SA comparator group of ports has been extended with the Port of Fremantle.

It is worth noting that the proclaimed SA ports, Geelong, Portland and Brisbane are all privately owned with the remaining ports operated by state government owned corporations.

3.3 Data collection process

The data collection process is both time-consuming and is unable to cover 100% of the required information due to the commercial in-confidence nature of some of the data. However, the majority of the required information has been successfully gathered from public domain sources (the various port corporations, pilotage associations, and other state

government agencies concerned with maritime services and safety) with standard tariff data obtained from commercial independent towage companies (i.e. Svitzer, Port Lincoln Tugs, SMIT, PB Towage). A list of the sources of data used in the analysis is contained in Appendix C.

3.4 Charges coverage

The port charges (or costs) included in the analysis comprise two groups:

- ▶ EMS charges; and,
- ▶ Non-EMS charges.

The various charges making up EMS and non-EMS charges are presented in more detail below.

3.4.1 EMS charges

Since the published charges schedules of non SA ports do not use a common classification, it is necessary to assign particular charges to one of the three EMS categories (navigation services, harbour services and cargo services charges) that are applicable to the proclaimed SA ports. This, at times, involved a degree of subjective judgement.

The assignment of individual non SA port charges to the equivalent EMS categories was guided by the nature and coverage of the EMS categories as outlined below.

Navigation services charges

Included in this category are charges levied on a ship on entry to port. They are generally regarded as a charge for the right to enter the port and the provision of navigational aids, maritime access channels and port traffic control.

Typically such charges vary according to the size of the vessel measured in gross registered tons (GT). Usually these charges do not vary with the time the ship spends in port.

Harbour services charges

Included in this category are charges that are levied against the ship when it is alongside a berth/wharf. They may take the form of a flat charge per hour that a berth is occupied by the ship, or they may take the size of the vessel as well as the duration of berth occupancy into account.

Cargo services charges

Included in this category are charges that are levied on the basis of the volume of cargo loaded or discharged in the port. In addition, fees charged to stevedores for the temporary occupancy of the land behind the berth are included in this category.

Not all of these charges apply to every port. Table 2 presents an overview or checklist matrix of EMS charges that are known to be levied in each of the comparator ports.

Table 2: Overview of EMS charges for the comparator ports, 2011

Port	Navigation charges				Harbour services			Wharf charges					
	Navigation Services	Tonnage	Deep vessel surcharge	Conservancy	Harbour Services	Berthage	Mooring	Cargo Service	Harbour improvement due	Port Infrastructure Charge	Wharfage	Harbour dues (cargo based)	Facility hire/Site occupancy
Adelaide	x		X		x			x					
Port Giles	x				x			x					
Port Lincoln	x				x			x					
Port Pirie	x				x			x					
Thevenard	x				x			x					
Wallaroo	x				x			x					
Brisbane				x		x	x				x	x	
Bunbury	x					x	x			x			
Fremantle		x				x	x		x		x		x
Geelong	x		X			x	x						x
Geraldton		x					x		x		x		
Gladstone				x		x	x					x	
Melbourne		x				x	x			x	x		
Newcastle		x					x				x		x
Port Kembla		x					x				x		x
Portland		x				x	x				x		
Sydney	x						x				x		x
Townsville		x		x			x				x		

3.4.2 Non-EMS charges

Although ESCOSA does not have any direct input on the magnitude of maritime charges outside of the EMS outlined above, for benchmarking purposes ESCOSA is interested in covering all port charges faced by users. This allows for a more complete picture and recognises that parts of port pricing are outside the control of ESCOSA.

The non-EMS charges included in this analysis were limited to pilotage, towage and conservancy. There is a range of other minor maritime services provided in each port, but collectively these constitute only a small fraction of the total cost of a port call. Omission of these minor charges from the analysis is most unlikely to materially affect any of the results or conclusions of the analysis.

3.5 Specifications of model vessels

For each of the commodity groups included in the analysis, a model ship was defined, and a reasonable assumption made on the quantity of cargo exchanged per vessel port visit. In the case of grain two model vessels were defined: a Handymax vessel and a Panamax vessel. This brought the total number of model ships analysed to eight.

3.5.1 Grain - Handymax and Panamax

The specifications for the two grain vessels are based on the model ship used in the 2007 analysis (see Table 3).

Table 3: Specifications of Grain Handymax and Panamax model ships

Specification	Grain-Handymax	Grain-Panamax
GT	28,500	30,300
NT	20,000	22,000
DWT	45,000	55,000
LOA	185	190
Summer draught	11.5	13
Actual draught	11.25	12
Cargo type	Bulk grain	Bulk grain
Cargo worked	40,000	48,000
Cargo unit	Tonne (T)	Tonne (T)
Default handling rates (T/hr.)	500	500
Non-working time (hrs)	6	6

3.5.2 Dry bulk – concession and general

The dry bulk-concession vessel is modelled on the ship specifications used in the 2007 analysis. It has the following characteristics: 17,900 GT, 23,500 DWT, a draught of 9.25m, length of 168m and has an assumed load of 20,000 tonnes. The dry bulk-general vessel is virtually identical to the grain Handymax vessel (see Table 4).

Table 4: Specifications of dry bulk – concession and general model ships

Specification	Dry Bulk- general	Dry Bulk - concession
GT	28,500	17,900
NT	20,000	12,700
DWT	45,000	23,500
LOA	185	168
Summer draught	11.5	10
Actual draught	11.25	9.25
Cargo type	Standard dry bulk	Discounted dry bulk
Cargo worked	40,000	20,000
Cargo unit	Tonne (T)	Tonne (T)
Default handling rates (T/hr.)	500	500
Non-working time (hrs)	6	6

3.5.3 Model ships for other commodity sectors

The gross tonnage of the liquid bulk carrier (or tanker) is based on the typical size of ships calling at the oil berth in Port Adelaide — its other dimensions are based on estimations using samples from the subscription on-line database maintained by Clarksons.

The motor vehicle carrier specifications are based on a sample of car carriers visiting the Port of Adelaide. The number of cars assumed to be discharged or loaded was based on inquiries to industry on a 'reasonable' assumption for a car carrier of these dimensions.

The containership specification is based on the larger of the two model ships used by the Bureau of Infrastructure Transport and Regional Economics (BITRE) in its Waterline publications. The BITRE defined gross tonnage (GT) is used with the other dimensions sourced from a sample of vessels with the same GT from the subscription on-line database maintained by Containerisation International. To allow a fixed cargo time-series comparison, the assumed container exchange of 740TEU is the same as the one used in the 2007 analysis (i.e. the average of the five major Australian container ports in June 2006 as reported by BITRE Waterline).

The livestock carrier is based on the actual dimensions of 'Danny F', a livestock carrier with a long history of operation in the Australian trade. On the basis of industry inquiries, it has an assumed load of 40,000 head of sheep.

Table 5: Specifications of the model ships for other commodity sectors

Specification	Liquid bulk	Motor vehicle	Container	Livestock
GT	30,000	42,215.5	37,394	24,731
NT	12,379		15,644	7,419
DWT	47,030	14,840.75	46,116	14,823
LOA	183	178.625	225	202
Summer draught	12.37	8.46375	12	8.53
Actual draught	12	8	11	8
Cargo type	Liquid bulk	Motor vehicle	Container	Sheep
Cargo worked	40,000	2,500	740	40,000
Cargo unit	Kl	no.	TEU	head
Default handling rates (/hr.)	600	200	15	500
Non-working time (hrs)	6	2	2	6

3.6 Assumptions and limitations

It was possible to source data on most of the factors needed to undertake the benchmarking from reliable sources. However, in some instances data gaps have been filled by assumption.

- ▶ Only limited information on the number of tugs used for each vessel type in each port could be obtained. On the basis of industry inquiries and an inspection of port operation manuals where these contained relevant information, a default assumption of two tugs in, two tugs out was made for all model ships. This assumption was applied whenever more specific information was not available.
- ▶ There is little compiled data available on typical times at berth. The exception to this is for container vessels, where information published by BITRE filled the gap. Otherwise, bulk cargo loading rates were normally estimated as 90% of the rated capacity of the relevant bulk loading facility where this information was available. Elsewhere, a default assumption of 500 tonnes per hour was made. For liquid bulk vessels, an average discharge rate of 600tonnes/hour was used, and for car carriers a working rate of 200 vehicles per hour was assumed. Livestock carriers were assumed to load at a rate of 500 sheep per hour.

Perhaps the biggest single limitation of the analysis is that it is based entirely on published/standard schedules of charges, and does not take into account privately negotiated discounts from these rates. However, as this information is, almost by definition, commercially confidential, it is not possible to obtain reliable information on discounts offered across the wide range of ports required for a satisfactory benchmarking process. Under these

circumstances it is better to rely entirely on formal tariffs than to attempt to incorporate information on discounting that is fragmentary and uncertain.

4. Comparison of port charges by commodity group

4.1 Grain

4.1.1 Handymax vessels

Grain is a significant commodity in seven of the twelve comparator ports.

The EMS charges that would be incurred by the model Handymax grain vessel in SA regional ports are in the range \$75,000 to \$100,000; the difference between the ports is due entirely to the effect of differing ship-loading speeds influencing the time spent at berth.

Figure 4: Grain-Handymax vessel ship visit costs - total, 2011

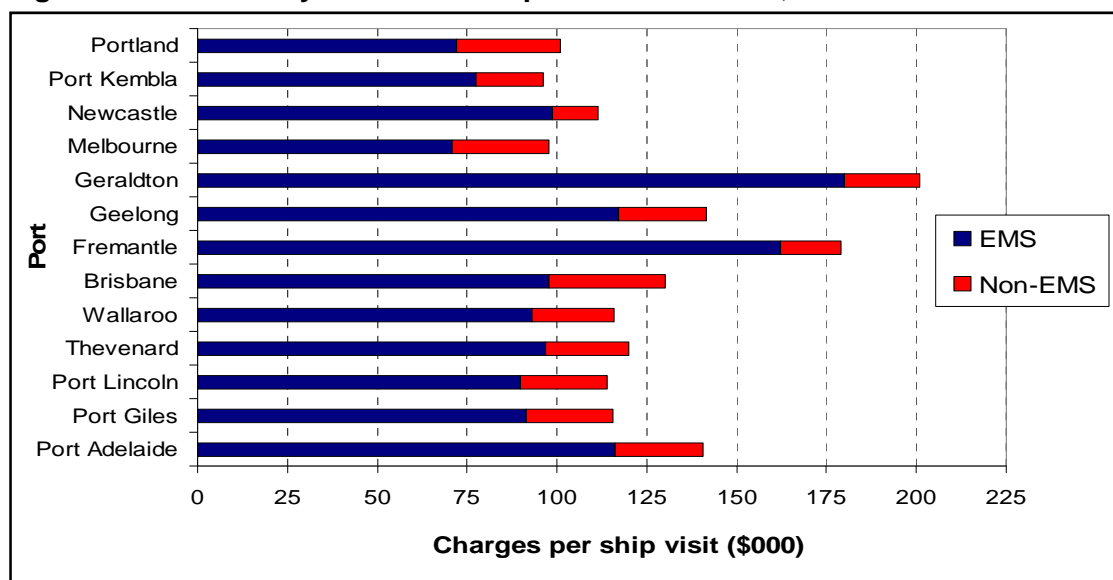


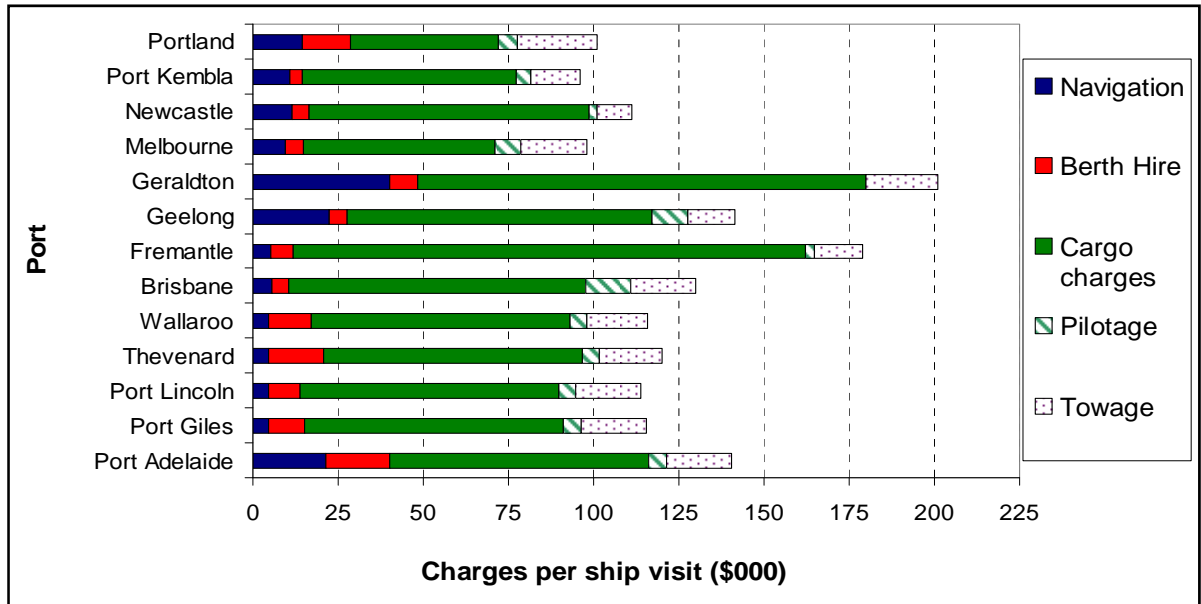
Figure 4 shows that total vessel ship visit costs are higher in Port Adelaide than in the regional SA ports because grain vessels are subject to the channel levy, introduced to fund the past channel deepening project. This is a cargo-based charge levied on specific commodities irrespective of the size of the vessel on which the cargo is carried.

Total charges for the SA ports fall in the higher end of the observed range. Total charges for Newcastle, Port Kembla, Portland, and Melbourne are lower than at any of the South Australian ports, but Geelong is higher than the regional SA ports.

On the other hand, total charges at Geraldton and Fremantle significantly exceed those at any SA port, while Brisbane is more expensive than any of the regional ports of SA. These comments remain true if only charges for the provision of EMS are considered.

The more detailed presentation of charges Figure 5 provides some insight into the breakdown of these costs.

Figure 5: Grain-Handymax vessel ship visit costs - detail, 2011

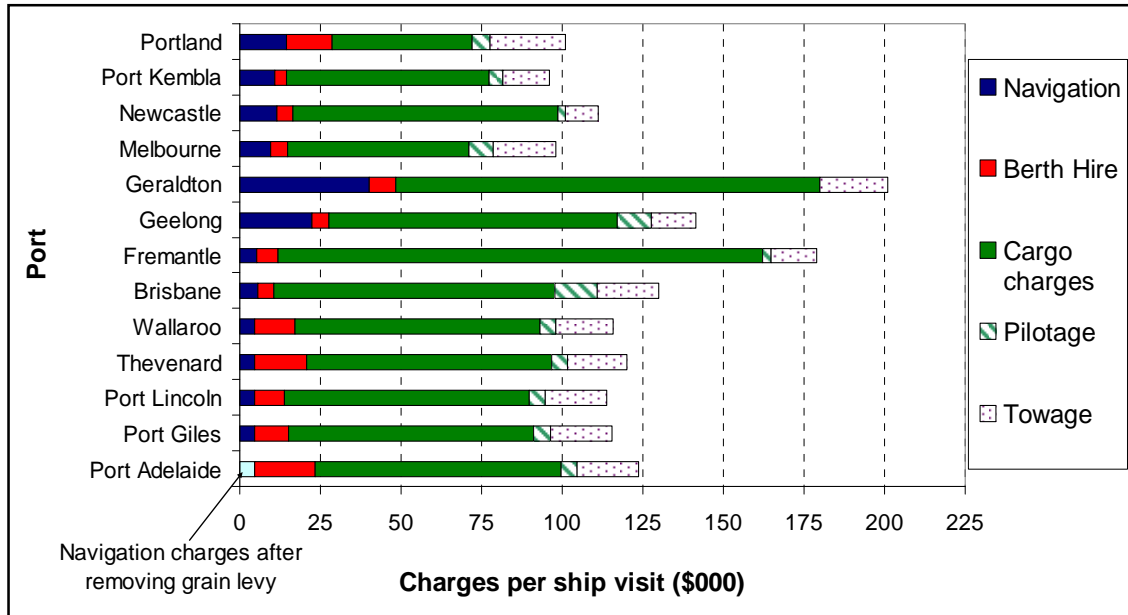


Since Port Adelaide is the only SA port to attract a grain levy, it is worth viewing how the results may differ if the grain levy is excluded from the benchmarking analysis.

Figure 6 shows a considerable narrowing of the gap between Port Adelaide and other SA ports, due to removing the grain levy and thereby reducing Port Adelaide navigation charges. The light blue coloured bar shows the lower navigation charges (after removing the grain levy) at Port Adelaide. However, Port Adelaide charges are still higher than the other four SA ports. For example, Port Adelaide charges are slightly higher than at Thevenard, and around 10% higher than charges at Port Giles and Port Lincoln. The reason for Port Adelaide recording relatively higher charges, even after abstracting from the influence of the grain levy, is because berth hire costs at Port Adelaide are higher than at other SA ports.

More generally, the impact of excluding the grain levy at Port Adelaide is to bring Port Adelaide charges to below those of the Port of Brisbane.

Figure 6: Grain-Handymax vessel ship visit costs - detail, 2011 (excluding grain levy at Port Adelaide)



4.1.2 Panamax vessels

Figure 7 and Figure 8 show the comparison between South Australian ports and the same set of comparator ports for slightly larger vessels being at the higher end of the Panamax size range.

The comparison for these larger vessels is very similar to that for Handymax vessels. As with the handymax charges, the grain levy at Port Adelaide means that charges for Panamax ships are notably higher at Port Adelaide compared to other SA ports. If the grain levy was excluded, the gap between Port Adelaide and other SA ports would narrow significantly.

Figure 7: Grain-Panamax vessel ship visit costs - total, 2011

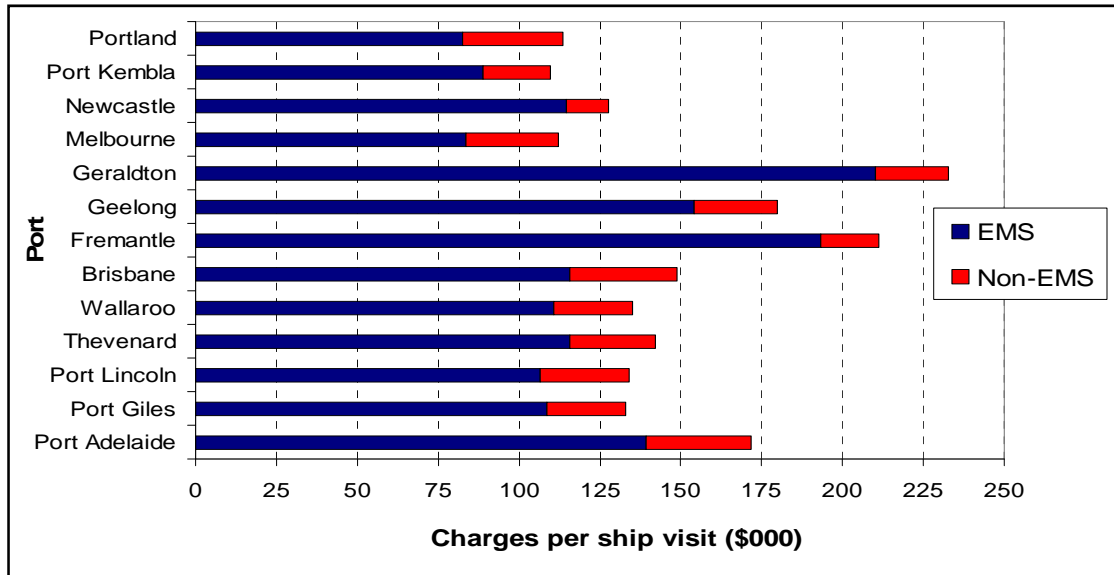
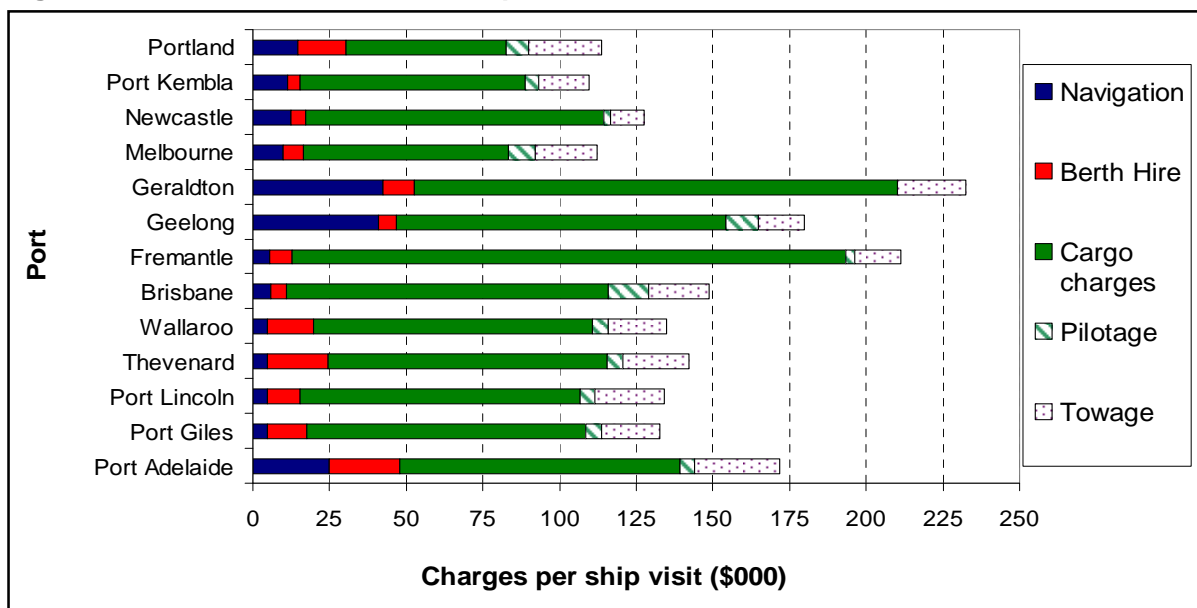


Figure 8: Grain-Panamax vessel ship visit costs - detail, 2011



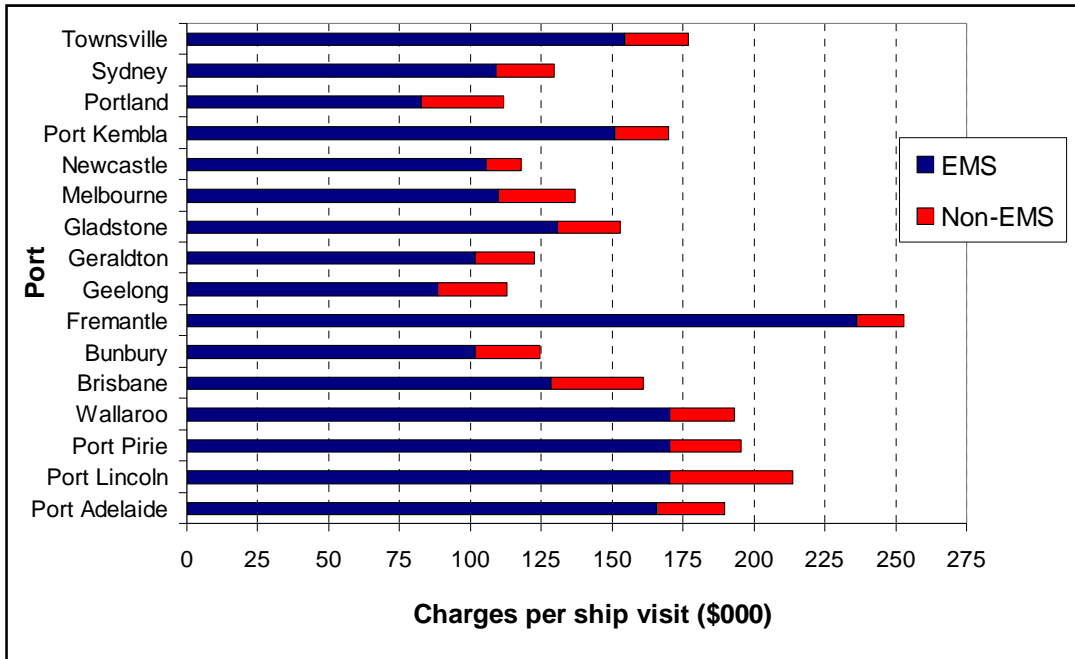
4.2 Dry bulk - general

The general dry bulk vessel classification covers a wide range of commodities including (but not limited to) bauxite, alumina, cement, fertiliser, woodchips, coal, iron ore, copper ore, limestone and sugar. Such a wide coverage implies that all the twelve comparator and most of the SA ports handle some cargoes that fall within this grouping.

Figure 9 shows that, with the exception of Fremantle, SA ports have the highest EMS charges for dry bulk commodities. This is also true for on a total charges basis. The main reason for

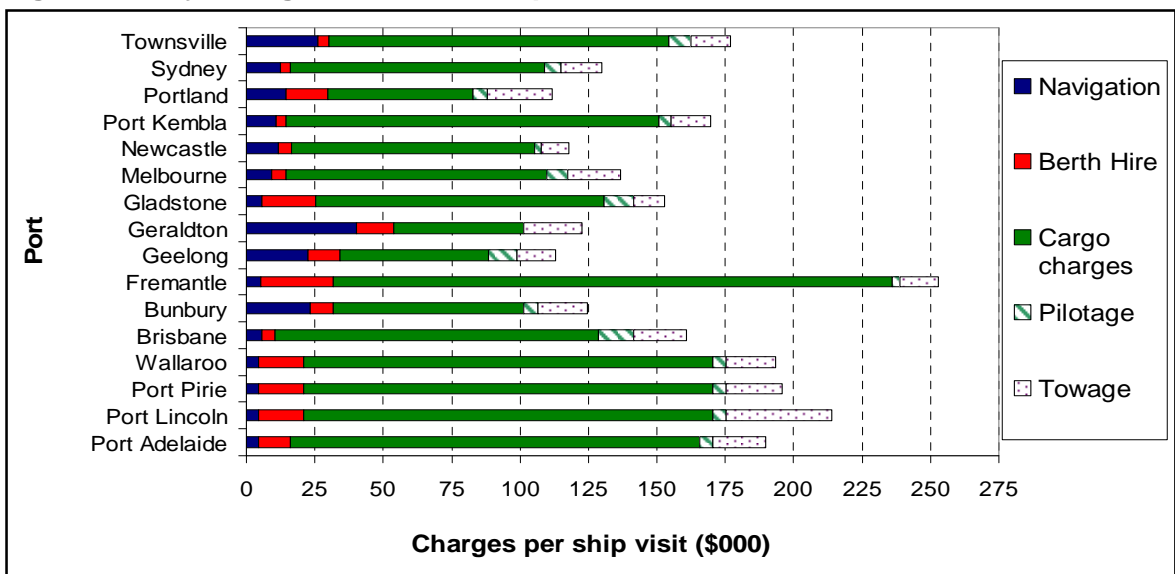
this is likely to be the smaller economies of scale for dry bulk cargoes at SA ports compared to non SA ports.

Figure 9: Dry bulk-general vessel ship visit costs - total, 2011



The composition of detailed vessel costs as shown in Figure 10 clearly demonstrates that cargo charges are the key parameter driving total dry bulk vessel visit charges at all the SA and non-SA comparator ports.

Figure 10: Dry bulk-general vessel ship visit costs - detail, 2011



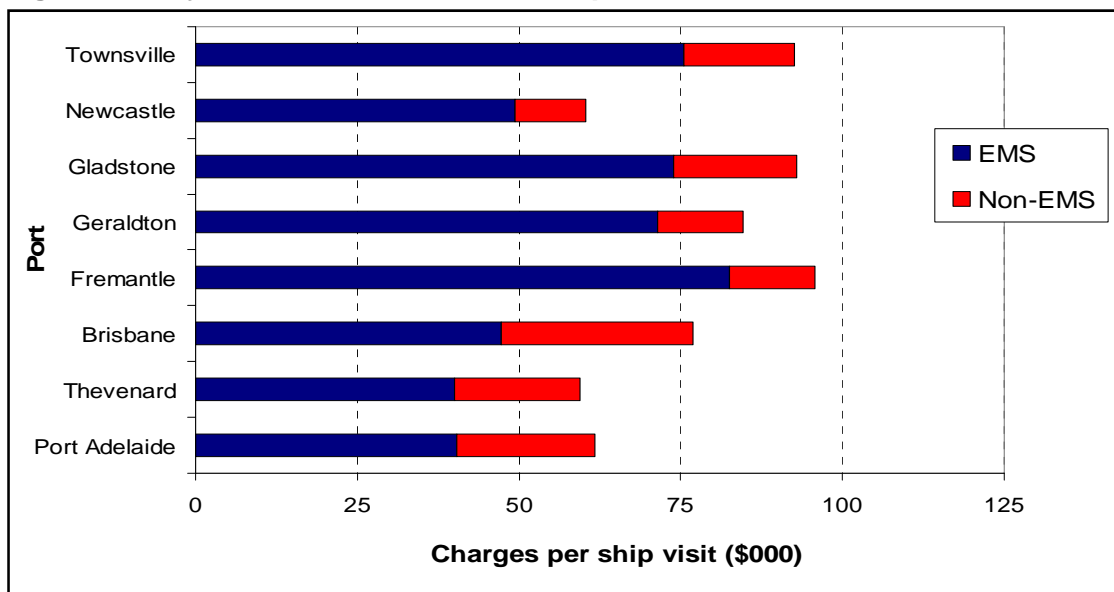
4.3 Dry bulk – concession

Many ports have some specific commodity rates — set lower than the general rate for dry bulk freight — for certain bulk commodities. The cargoes covered by these reduced rates are referred to in this report as concessional dry bulk cargoes

The specific commodities that are classified as concession dry bulk cargoes vary from port to port. Within the set of ports used for this analysis, these include coal, mineral sands, limestone, dolomite, gypsum, nickel ore, gypsum and salt. Port Adelaide accommodates vessels carrying limestone, and Thevenard handles gypsum and salt (the previously proclaimed port of Ardrossan would also be classed as handling a concessional dry bulk cargo, namely dolomite).

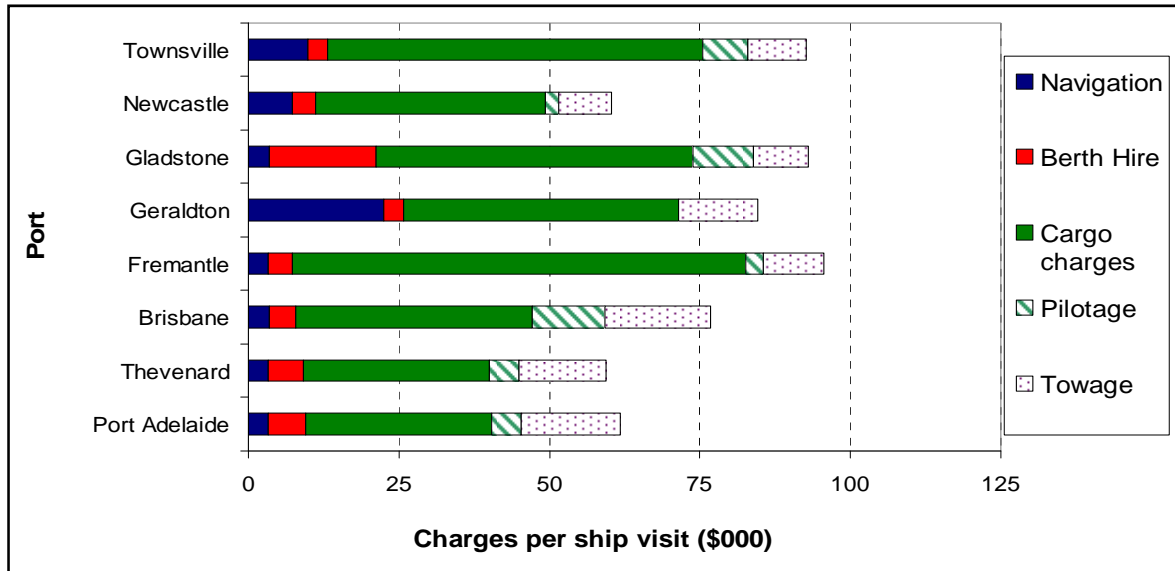
Figure 11 shows that the relevant SA ports are positioned around the lower end of sample range. This is attributable to a relatively lower unit cargo service charge at Port Adelaide and Thevenard. Unit charges for concessional dry bulk commodities at Port Adelaide is \$1.54 per tonne, while for the Queensland ports the relevant unit charge ranges from \$1.97 per tonne at Brisbane to \$3.11 per tonne at Townsville.

Figure 11: Dry bulk-concession vessel ship visit costs - total, 2011



The composition of detailed vessel costs as shown in Figure 12 indicates that while cargo charges are important in explaining the trends in total visit costs for vessels carrying concessional dry bulk products, they do not appear to be as significant as is the case for grains and general dry bulk cargo vessels. This is due to the fact that the discriminatory pricing practices adopted by ports (such as offering price discounts to certain commodities in a bid to stimulate additional port trade) are more effectively implemented via a specific cargo or wharfage based charge, rather than a ship based charge.

Figure 12: Dry bulk-concession vessel ship visit costs - detail, 2011



4.4 Liquid bulk

Figure 13 and Figure 14 show the total and detailed situation of the port visit costs for liquid bulk (tankers). The relevant SA ports of Port Adelaide and Port Lincoln are the most expensive liquid bulk ports compared to the comparator ports. The key reason behind the significantly higher charges at Port Adelaide and Port Lincoln is a materially higher cargo service unit charge. The unit charge for liquid bulk commodities at Port Adelaide and Port Lincoln is \$5.19 per kilolitre (or tonne). This compares with a unit charge for liquid bulk commodities of \$2.44, \$2.19 and \$2.05 per kilolitre at the ports of Melbourne, Sydney and Port Kembla, respectively.

Figure 13: Liquid bulk vessel ship visit costs - total, 2011

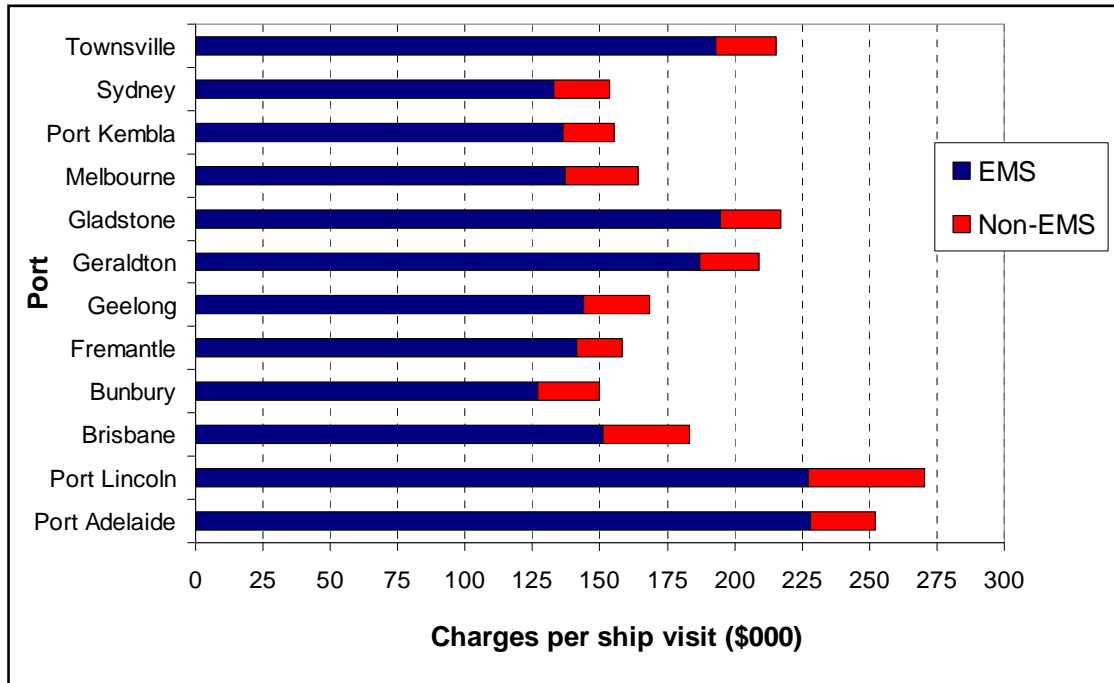
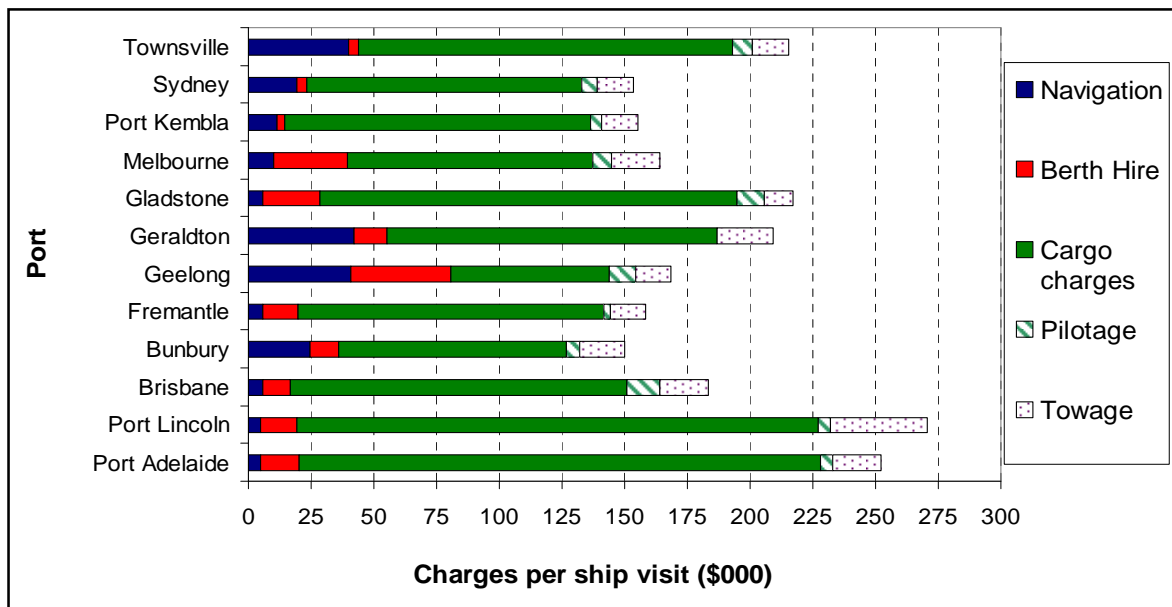


Figure 14: Liquid bulk vessel ship visit costs - detail, 2011



4.5 Motor vehicles

Unlike the grain, non-grain dry bulk and liquid bulk categories, there are only a handful of ports handling substantial volumes of motor vehicles. Port Adelaide is the only SA port accommodating motor vehicle cargoes.

It is worth noting that the motor vehicle shipping operations at Sydney Ports were transferred to Port Kembla after the 2007 benchmarking study such that Port Kembla is now the motor vehicle comparator for NSW.

Figure 15 and Figure 16 show the total and detailed port visit costs for motor vehicles vessels (which are known as Pure Car Carriers with roll-on/roll-off capability via side and stern ramps). EMS only charges at Port Adelaide are at the higher end of the comparator range.

Charges at Port Adelaide are markedly higher than those at Melbourne and Port Kembla. This primarily reflects the comparatively higher cargo services unit rate at Port Adelaide. The unit charge for motor vehicles at Port Adelaide is \$34.61 per vehicle, while the same charge is \$20.13 and \$23.25 per vehicle at Melbourne and Port Kembla, respectively.

Figure 15: Motor vehicle ship visit costs - total, 2011

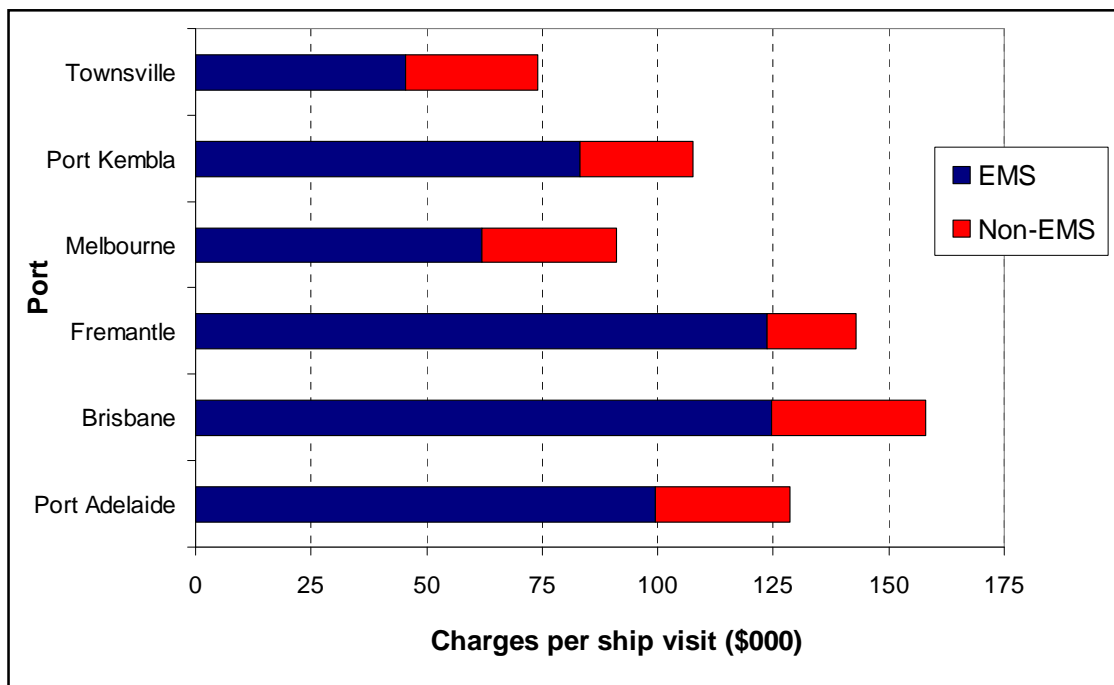
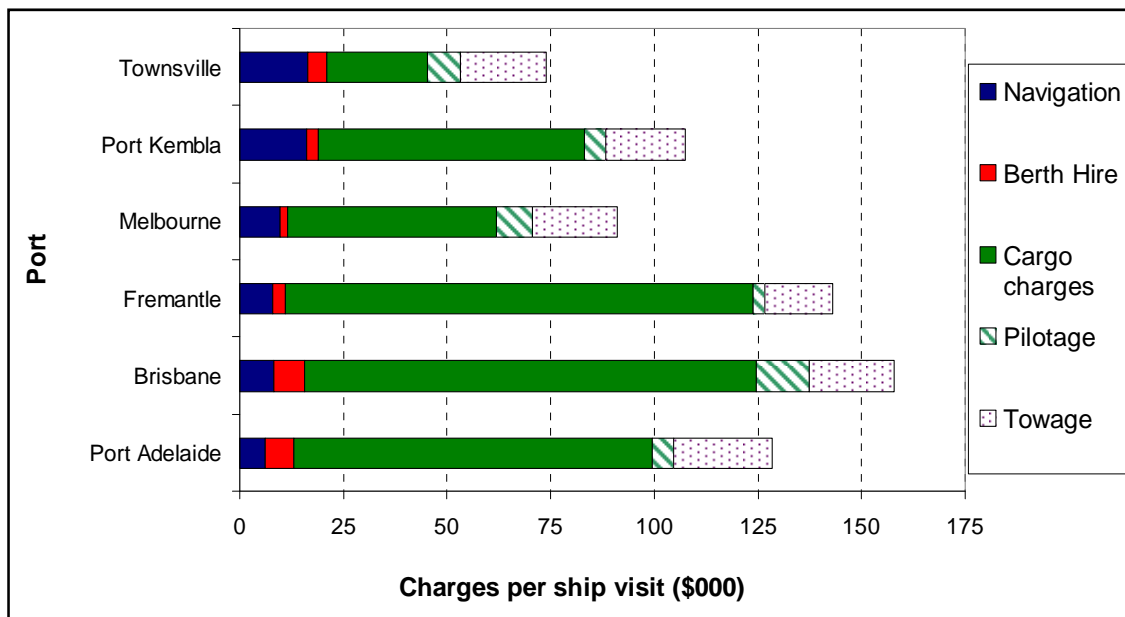


Figure 16: Motor vehicle ship visit costs - detail, 2011



4.6 Containers

There are only four comparator ports with significant container cargo shipping operations. Port Adelaide is the only SA port handling containerships.

Figure 17 shows Port Adelaide is the cheapest port for containership visits. Charges at Port Adelaide are slightly lower than at Fremantle. Total charges at the three eastern seaboard ports of Brisbane, Melbourne and Sydney are around 17% higher than at Port Adelaide. Sydney is the most expensive port for containership visits.

The breakdown of total charges shows cargo charges are the most significant component of total charges (see Figure 18).

It is worth noting that cargo charges at Melbourne include a port improvement fee. This fee is levied on containerships to recover the cost of significant channel deepening works undertaken between 2009 and 2011. As such, it is essentially a channel levy or deep water surcharge levied at the cargo (or wharfage) level rather than at the navigation charge level. Moreover, the introduction of the port improvement fee has resulted in Melbourne moving from being the cheapest port relative to the comparator ports (as was the case in the 2007 benchmarking analysis) to now being among the more expensive ports for containership visits.

Figure 17: Container ship visit costs - total, 2011

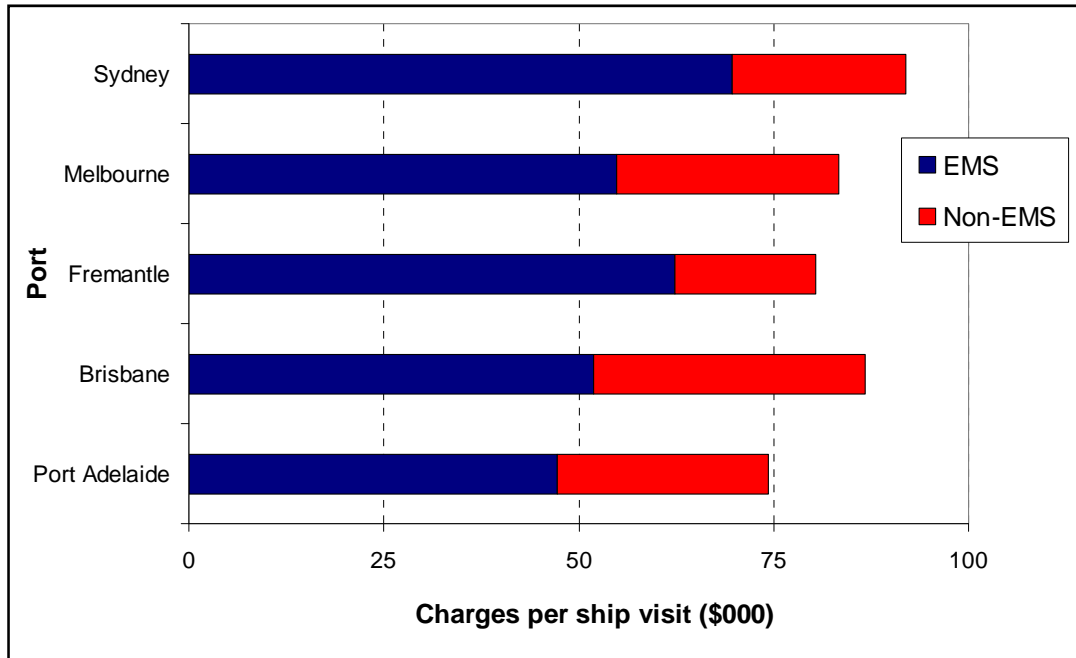
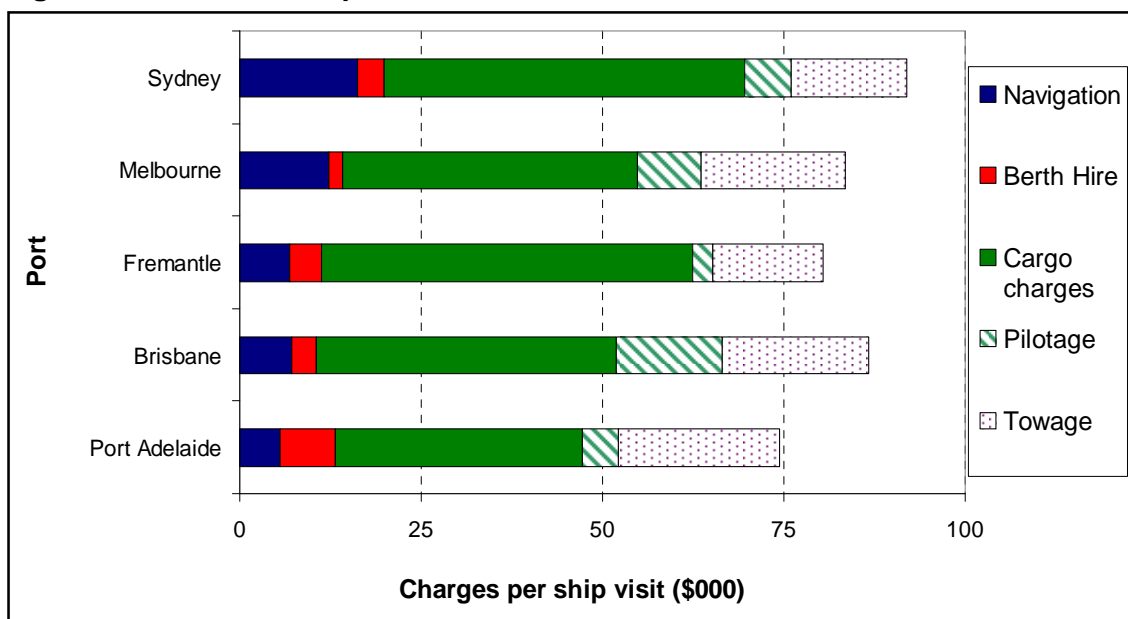


Figure 18: Container ship visit costs - detail, 2011



4.7 Livestock

There are only four comparator ports with sizeable livestock cargo shipping operations. Port Adelaide is the only SA port receiving and dispatching livestock cargoes using appropriate vessels.

Figure 19 and Figure 20 show Port Adelaide has the lowest port charges for livestock carriers across the comparator ports.

Figure 19: Livestock ship visit costs - total, 2011

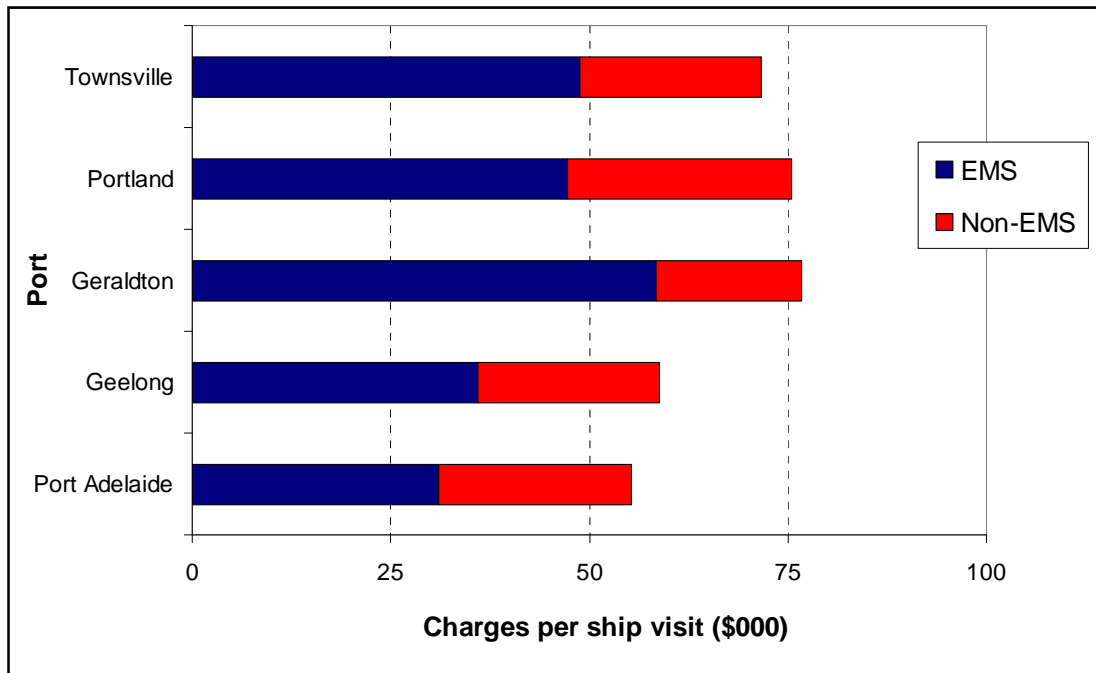
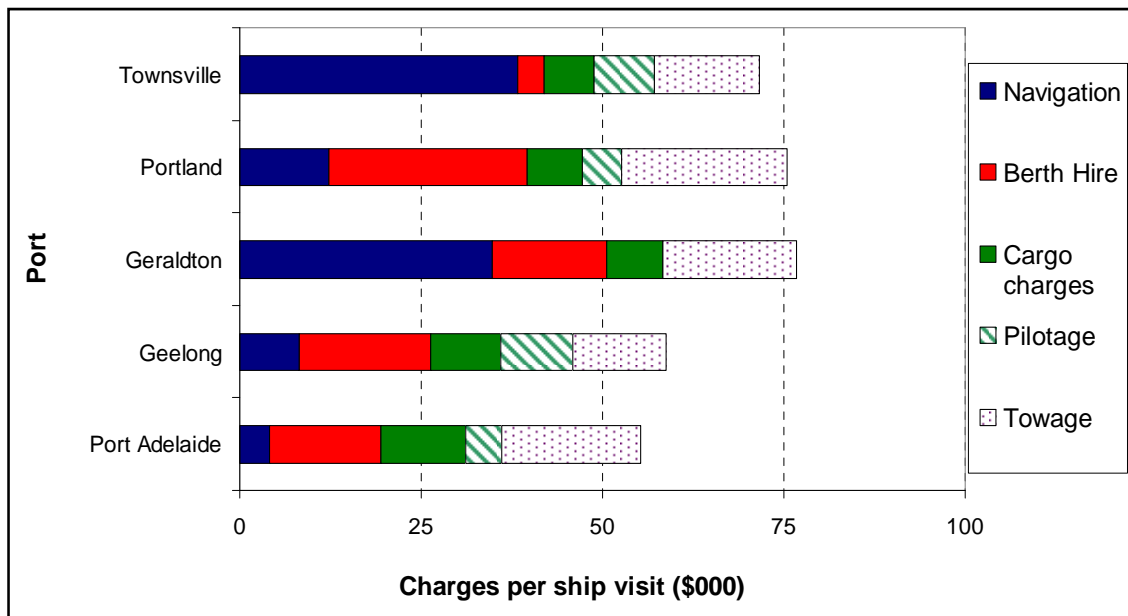


Figure 20: Livestock ship visit costs - detail, 2011



5. Comparison of overall port prices

5.1 Overall price comparison

5.1.1 Assembling and using trade data

As outlined in Figure 2 in Section 2, trade volume data for each individual port was assembled and each trade element assigned to one of the commodity groups.

In some instances, charges were expressed as prices per unit, while trade volume flows were expressed in mass or revenue tonnes. To deal with these cases, it was necessary to define some conversion factors. The conversion factors shown in Table 6 were used throughout the analysis.

Table 6: Conversion factors used in assigning weights

Commodity type	Unit	Mass tonnes	Revenue tonnes
Full containers	TEU	12	20
Empty containers	TEU	2	4
Liquid bulk products	Kilolitre	0.80	1.0
Motor vehicles	Unit	1.2	12.5
Livestock (sheep)	Head	0.06	0.06

The volumes for each commodity group at each port in the sample set are shown in Table 7 (non SA ports) and Table 8 (SA ports). It is clear that the composition of trade varies greatly from port to port. This variation, and the fact that, in a number of instances, a port's charges for one type of commodity may be high but for another commodity may be relatively low, make an overall evaluation of price levels difficult. Overcoming this difficulty requires weighting of prices for each commodity group in accordance with the relative importance of that component of the commodity mix.

5.1.2 Computing representative costs for each commodity group

Table 7 and Table 8 were used to develop representative costs per revenue tonne for each of the commodity groups. The representative cost per revenue tonne was obtained as the volume-weighted average of the cost at each individual port. This was done both for EMS charges only (see Table 9) and for the broader based cost measure that includes towage, pilotage and conservancy due (see Table 10).

The results of this process are shown in Figure 21 and Figure 22.

Table 7: Non-South Australia comparators: Revenue tonnes by port and commodity group, 2011 (000's)

Commodity group	Brisbane	Bunbury	Fremantle	Geelong	Geraldton	Gladstone	Melbourne	Newcastle	Port Kembla	Portland	Sydney	Townsville
Bulk grain	989	-	-	1,655	1,829	241	2,093	1,330	1,627	449	-	-
Discounted dry bulk	8,822	-	1,086	-	6,505	64,822	4	108,257	-	-	-	3,720
Standard dry bulk	1,028	12,623	1,280	1,069	1,373	16,601	843	3,754	23,904	1,765	1,012	4,308
Liquid bulk	15,209	1,529	40	6,199	318	1,778	570	466	445	-	15,826	292
Motor vehicles	5,217	-	1,626	-	-	75	2,312	-	41,787	-	0.6	193
Container	15,340	-	9,789	-	-	12	39,916	-	-	-	31,427	-
Livestock	-	-	227	20	4	-	20	-	-	98	-	48
General	928	151	1,316	54	41	600	838	862	3,496	327	198	2,156
Total	47,533	14,304	15,365	8,996	10,070	84,128	46,596	114,669	71,259	2,640	48,463	10,717

Table 8: South Australian proclaimed ports: Revenue tonnes by port and commodity group, 2011 (000's)

Commodity group	Port Adelaide	Port Giles	Port Lincoln	Port Pirie	Thevenard	Wallaroo
Bulk grain	1,865	521	1,938	-	413	658
Discounted dry bulk	626	-	-	-	1,786	-
Standard dry bulk	1,589	-	185	589	-	45
Liquid bulk	2,940	-	168	-	-	-
Motor vehicles	831	-	-	-	-	-
Container	3,824	-	-	-	-	-
Livestock	11	-	-	-	-	-
General	626	-	-	1	506	-
Total	12,313	521	2,291	590	2,705	703

Table 9: EMS charges per revenue tonne for each model ship visit (2011 charges)

	Grain - Handymax	Grain - Panamax	Dry bulk - general	Dry bulk – concession	Liquid bulk	Motor vehicle	Container	Livestock
Port Adelaide	\$2.91	\$2.90	\$4.14	\$2.02	\$5.70	\$3.19	\$3.48	\$12.95
Port Giles	\$2.28	\$2.26	-	-	-	-	-	-
Port Lincoln	\$2.24	\$2.22	\$4.26	-	\$5.68	-	-	-
Port Pirie	-	-	\$4.26	-	-	-	-	-
Thevenard	\$2.42	\$2.41	-	\$2.00	-	-	-	-
Wallaroo	\$2.32	\$2.31	\$4.26	-	-	-	-	-
Brisbane	\$2.44	\$2.41	\$3.21	\$2.36	\$3.77	\$3.99	\$3.51	-
Bunbury	-	-	\$2.54	-	\$3.17	-	-	-
Fremantle	\$4.05	\$4.03	\$5.90	-	\$3.54	\$3.96	\$4.22	-
Geelong	\$2.93	\$3.21	\$2.21	-	\$3.60	-	-	\$14.97
Geraldton	\$4.50	\$4.38	\$2.54	\$3.57	\$4.67	-	-	\$24.33
Gladstone	-	-	\$3.26	\$3.69	\$4.87	-	-	-
Melbourne	\$1.77	\$1.74	\$2.75	-	\$3.43	\$1.98	\$3.71	-
Newcastle	\$2.47	\$2.39	\$2.63	\$2.47	-	-	-	-
Port Kembla	\$1.93	\$1.85	\$3.77	-	\$3.41	\$2.66	-	-
Portland	\$1.80	\$1.72	\$2.07	-	-	-	-	\$19.69
Sydney	-	-	\$2.73	-	\$3.32	-	\$4.71	-
Townsville	-	-	\$3.86	\$3.77	\$4.82	\$1.02	-	\$20.33

Note: The blank cells indicate that the port handled little or no cargo in that vessel category during 2011, and therefore no meaningful charge for that category is included in the analysis.

Table 10: Total charges per revenue tonne for each model ship visit (2011 charges)

	Grain - Handymax	Grain - Panamax	Dry bulk - general	Dry bulk - concession	Liquid bulk	Motor vehicle	Container	Livestock
Port Adelaide	\$3.51	\$3.58	\$4.75	\$3.08	\$6.30	\$4.11	\$5.32	\$23.04
Port Giles	\$2.89	\$2.77	-	-	-	-	-	-
Port Lincoln	\$2.85	\$2.79	\$5.35	-	\$6.76	-	-	-
Port Pirie	-	-	\$4.89	-	-	-	-	-
Thevenard	\$2.00	\$2.96	-	\$2.97	-	-	-	-
Wallaroo	\$2.90	\$2.81	\$4.83	-	-	-	-	-
Brisbane	\$3.25	\$3.10	\$4.02	\$3.84	\$4.58	\$5.05	\$5.86	-
Bunbury	-	-	\$3.11	-	\$3.75	-	-	-
Fremantle	\$4.48	\$4.40	\$6.33	\$4.78	\$3.96	\$4.57	\$5.44	-
Geelong	\$3.54	\$3.75	\$2.82	-	\$4.21	-	-	\$24.50
Geraldton	\$5.02	\$4.85	\$3.07	\$4.23	\$5.23	-	-	\$31.96
Gladstone	-	-	\$3.82	\$4.65	\$5.43	-	-	-
Melbourne	\$2.45	\$2.33	\$3.42	-	\$4.11	\$2.91	\$5.64	-
Newcastle	\$2.78	\$2.66	\$2.95	\$3.02	-	-	-	-
Port Kembla	\$2.40	\$2.28	\$4.24	-	\$3.88	\$3.44	-	-
Portland	\$2.52	\$2.37	\$2.79	-		-	-	\$31.45
Sydney	-	-	\$3.24	-	\$3.84		\$6.22	-
Townsville	-	-	\$4.42	\$4.63	\$5.38	\$2.37		\$29.84

Note: The blank cells indicate that the port handled little or no cargo in that vessel category during 2011, and therefore no meaningful charge for that category is included in the analysis.

Figure 21: Average EMS charges per revenue tonne of cargo loaded/discharged for various ship models, 2011

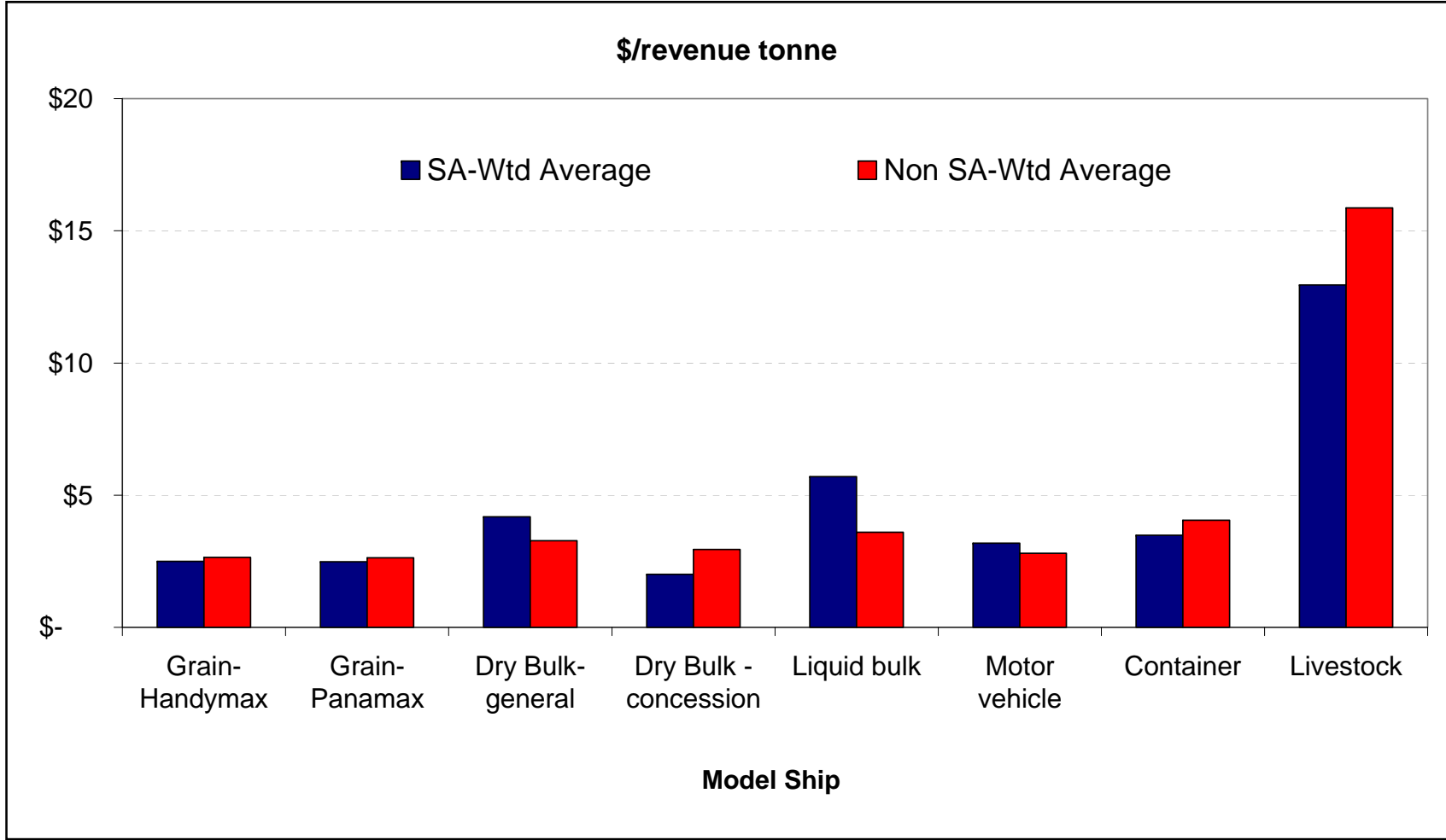
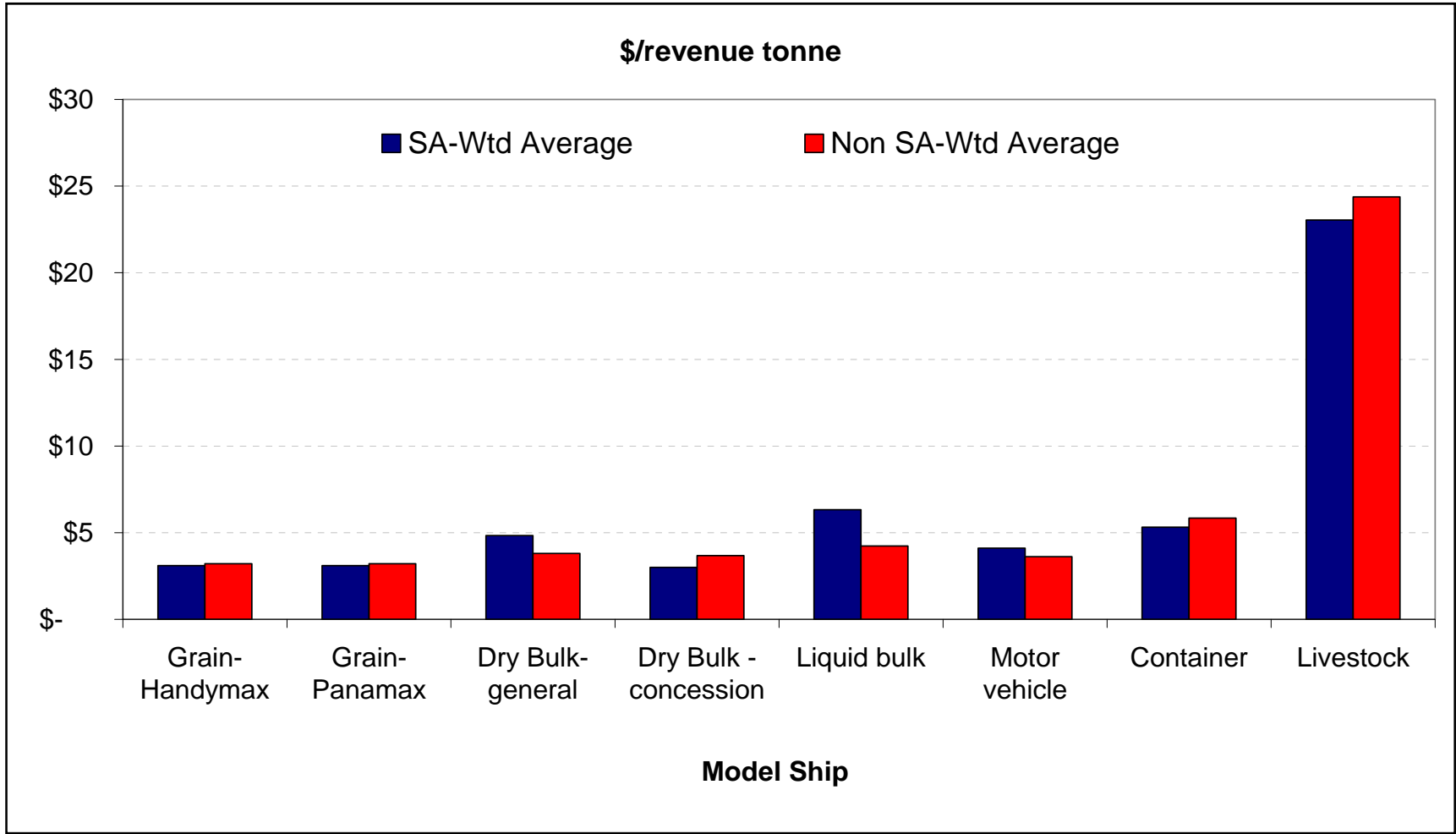


Figure 22: Average total charges per revenue tonne of cargo loaded/discharged for various ship models, 2011



5.1.3 Producing a single measure of relative prices

Building on these foundations, a single measure of relative prices as at 2011 was subsequently constructed by weighting the representative price for each commodity group according to the relative importance of that particular cargo group in the overall trade mix. The results of this analysis are displayed in Table 11.

Table 11 shows that in 2011 the cost of using SA ports is marginally higher than the cost of using the non-SA ports in the sample set. If EMS charges alone are considered, the difference is approximately 0.8%, with a range of -4.5% to 6.4% depending on which set of weights is applied. On a total charges basis, the difference is somewhat greater, with the costs of using SA ports approximately 3.4% higher than the comparator ports.

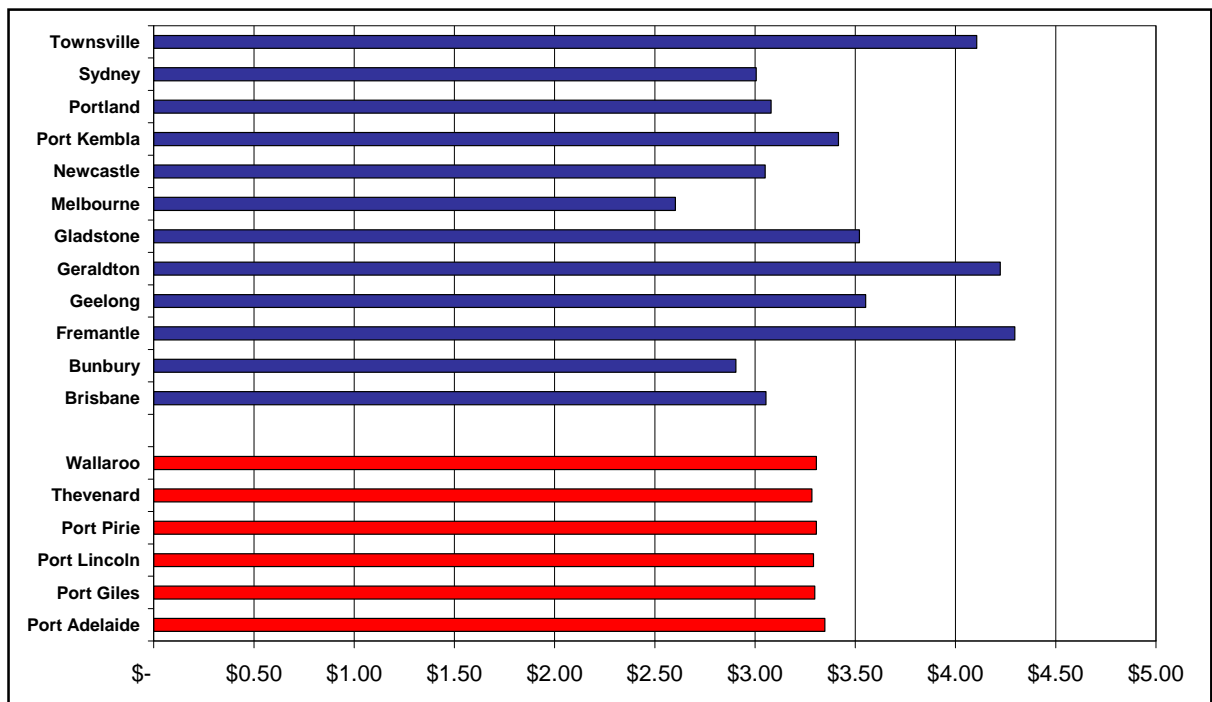
Table 11: Summary measures of relative prices, 2011

Weighted average port costs - EMS Charges 2011			
	Non SA Ports	SA Ports	Difference
Use Non-SA weights	\$3.28	\$3.13	-4.5%
Use SA Weights	\$3.25	\$3.46	6.4%
Mean (geometric)	\$3.26	\$3.29	0.8%
Weighted average port costs - Total Charges 2011			
	Non SA Ports	SA Ports	Difference
Use Non-SA weights	\$4.20	\$4.21	0.1%
Use SA Weights	\$4.12	\$4.41	6.8%
Mean (geometric)	\$4.16	\$4.30	3.4%

In Figure 23, the weighting technique outlined above was applied to the prices charged by each port individually, rather than to the two groups of ports. It is worth noting that this is somewhat artificial, as it puts some weight on the process that would be charged in a particular port if certain cargoes that are not at present handled in the port were to use it. However, this is unlikely to greatly distort the outcomes.

Figure 23 displays how the 2011 level of EMS charges at the proclaimed SA ports compares with the non SA ports.

Figure 23: Comparison of weighted average charges for individual ports (\$/revenue tonne, 2011)



The key observations of Figure 23 include:

- There is a high degree of similarity in the level of EMS charges across the SA ports. This is to be expected given the largely uniform tariff structure applied to Port Adelaide and regional SA ports by Flinders Ports.
- As at 2011, EMS charges at SA ports were slightly above the middle of the comparator range.
- The level of 2011 EMS charges in SA ports is below the level observed in five of the twelve comparator ports. These are Fremantle, Geraldton, Townsville, Gladstone and Geelong. It is worth noting that for the 2007 benchmarking study EMS charges in SA ports at that time were lower than four of the comparator ports.
- EMS charges in SA ports are currently at around the same levels as those prevailing at Port Kembla in NSW.
- There are currently six non SA ports which have lower EMS charges than the SA ports. These are Melbourne, Bunbury, Sydney, Portland, Newcastle and Brisbane. Of particular note here is the port of Melbourne, where EMS charges are significantly lower than those at SA ports. This was also the case in the 2007 benchmarking study, where the Port of Melbourne not only had substantially lower EMS charges than the SA ports but it also had the lowest charges of all the surveyed ports.

Expanding on the above point, there are a few factors that are likely to explain why port charges at SA ports are higher than those prevailing at some of other ports, particularly the large capital city ports of Melbourne, Sydney and Brisbane.

- SA ports do not have the benefits of economies of scale effects and geographic advantages of some of the non SA ports. In terms of geography, Flinders Ports in SA is unusual in that it is a single port corporation whose operations cover a number of geographically dispersed sites. (TasPorts operates in a similar manner in Tasmania).

While operating several small ports under a single ownership structure eliminates some of the disadvantages of small scale, it cannot eliminate them all. For example, it cannot eliminate low physical asset utilisation rates at remote ports. The narrow and cyclical trade base of remote SA ports can present pricing challenges, particularly during downturn period (i.e. very low or zero volumes for cyclical or highly variable commodity cargoes like grain) because the port operator is still required to maintain charges to cover the fixed costs of port infrastructure operations.

- ▶ Related to the above is that the volume throughput of the South Australian ports is not high. Port Adelaide does not have the large container throughput of the other capital city ports of Melbourne, Sydney and Brisbane; and the SA regional ports do not enjoy the large scale mining exports that characterise ports like Newcastle, Gladstone and Bunbury. This means per unit tonnage charges at SA ports will necessarily need to be higher (than these SA ports) to cover for the costs of non-scalable port infrastructure facilities.
- ▶ It is acknowledged that there is, to a greater or lesser degree, an element of under-pricing across most government-owned Australian ports. These ports generally do not earn a commercial rate of return on the capital funds invested in them. In contrast, Flinders Ports is a privately owned port operating company, which is required to set their SA port service charges at levels consistent with attaining a commercial or market style rate of return. The implication is that the port prices set by a publicly owned port authority like the Port of Melbourne Corporation are likely to be lower than port prices set by Flinders Ports.
- ▶ Appendix A provides includes detail on some of the other factors that explain differences in charges across ports.

5.2 Changes over time

The 2011 level of EMS and total charges for SA and non SA ports (as outlined in the above section) is a snapshot in time – i.e. for the single year of 2011. This is also the case for the port ship visit costs by commodity group in Section 4. It does not convey information about how much charges have changed over time and yet this is the aspect that is likely to be of most interest to regulators. This is because the extent to which charges change over time provides regulators with insights into what factors beyond CPI inflation could be having an influence on the level of charges. For example, strong growth in trade volumes over time may require substantial capital investment in new berth infrastructure and ship loading equipment. This may need to be funded by increases in unit charges that are materially higher than a CPI-based increase in charges which is based on a business as usual or trend increase in trade volumes (i.e. no higher than 3% per year).

Since this benchmarking analysis was last undertaken for 2006 charges, it is possible to gauge whether ship visit charges at SA ports have increased at a higher or lower rate relative to equivalent ship visit charges at non SA ports over a five year period between 2006 and 2011.

Table 12 and Table 13 outline how charges at SA ports have tracked relative to non SA ports on an EMS and total charges basis, respectively.

Table 12 shows that SA port charges are currently around 1% higher than those at non SA ports. This represents a virtual closing of the previous gap that existed in 2006, where SA port charges were 17% higher than non SA port charges. EMS charges for SA ports have increased by 17% over the five year period, while EMS charges for non SA ports have increased by 36% over the same period.

Annual EMS charges at SA ports have moved up at a little more than the annual rate of inflation rate over the past five years. This is in contrast with annual EMS charges at non SA ports, which have grown at approximately double the rate of inflation, on average, over each of the five year period.

Table 13 conveys a similar message to Table 12, with total charges for SA ports now being 3½% higher than total charges at non SA ports. This is down from a 15% premium paid by shipping lines to visit SA ports (compared to ships visiting non SA ports) back in 2006.

Table 12: Changes in EMS charges from 2006 to 2011

Weighted average port costs – EMS Charges			
	Non SA Ports	SA Ports	Difference
Use Non-SA weights	\$3.28	\$3.13	-4.5%
Use SA Weights	\$3.25	\$3.46	6.4%
Mean (geometric) 2011	\$3.26	\$3.29	0.8%
<hr/>			
Use Non-SA weights	\$2.42	\$2.86	15.9%
Use SA Weights	\$2.38	\$2.76	17.6%
Mean (geometric) 2006	\$2.40	\$2.81	17.2%
Percentage point reduction in gap between SA and non SA port EMS charges over the past 5 years			16.4

Table 13: Changes in Total Charges from 2006 to 2011

Weighted average port costs – Total Charges			
	Non SA Ports	SA Ports	Difference
Use Non-SA weights	\$4.20	\$4.21	0.1%
Use SA Weights	\$4.12	\$4.41	6.8%
Mean (geometric) 2011	\$4.16	\$4.30	3.4%
<hr/>			
Use Non-SA weights	\$3.36	\$3.87	15.2%
Use SA Weights	\$3.16	\$3.63	14.9%
Mean (geometric) 2006	\$3.26	\$3.75	15.0%
Percentage point reduction in gap between SA and non SA port total charges over the past 5 years			11.6

Overall, while total ship visit costs are still higher at SA ports compared to non SA ports, the results clearly suggest that the notable gap has closed substantially over the past five years. This is an important finding that is investigated and explained in more detail below.

5.2.1 Factors behind the closing of the gap between SA and non SA port prices

In attempting to explain what may be the key drivers of the results (shown in Table 12 and Table 13), it is important to appreciate that there are limits to the type of detailed insights that one would ideally like to obtain from this benchmarking analysis. These limits primarily reflect the level at which this analysis is being undertaken, i.e. it is a desktop analysis that relies solely on publicly available ship visit charges schedules that for the most part do not provide information on the rationale/justifications behind an increase in a particular charge (whether it be a wharfage, berth hire or navigation charge) over the previous year or over a five year period. Consultation with port owners/operators on the rationale/justifications for annual changes to charges is outside of the scope of this study. For this reason, it is not possible to be definitive in this analysis.

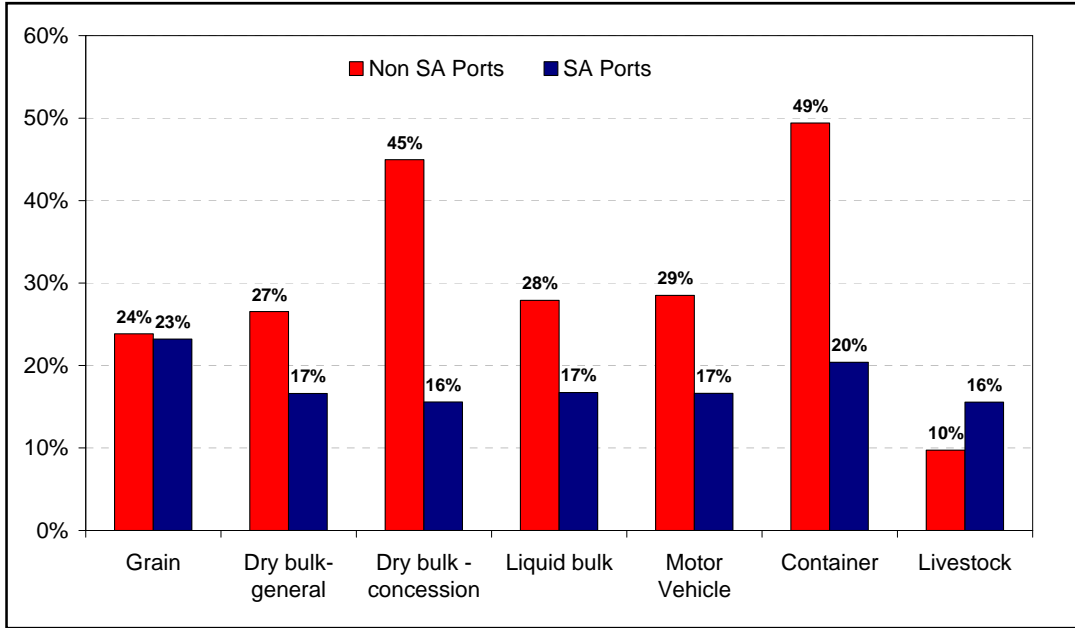
Having said this, one can make some informed judgements by drilling down on the commodity specific results to check whether it is broadly consistent with known developments across the port operating landscape more generally over the past five years. These known developments include exceptional growth in demand for dry bulk export volumes which in some cases has necessitated increases in port charges to fund investments in port capacity and infrastructure. Given this, one way of explaining what may be behind the significant closing the gap between SA and non SA port charges over the past five years is to focus on:

- ▶ which specific commodity group charges have recorded the largest increases at non SA ports relative to SA ports; and,
- ▶ whether these specific cargo charges attract a high weighting in the trade volume base that is used to generate the single weighted measure of charges for SA and non SA ports.

Figure 24 outlines the rate of increase between 2006 and 2011 for SA and non SA EMS charges across the seven commodity groups. The commodity groups where the non SA ports have recorded the highest rate of increase in charges over and above that of SA port charges are containers, dry bulk (concession), motor vehicles and dry bulk (general).

- ▶ Container vessels experienced an increase of 49% in EMS charges at non SA ports between 2006 and 2011. This compares with an increase of 20% in EMS charges at SA ports over the same period.
- ▶ Dry bulk (concession) vessels experienced an increase of 45% in EMS charges at non SA ports between 2006 and 2011. This compares with an increase of 16% in EMS charges at SA ports over the same period.

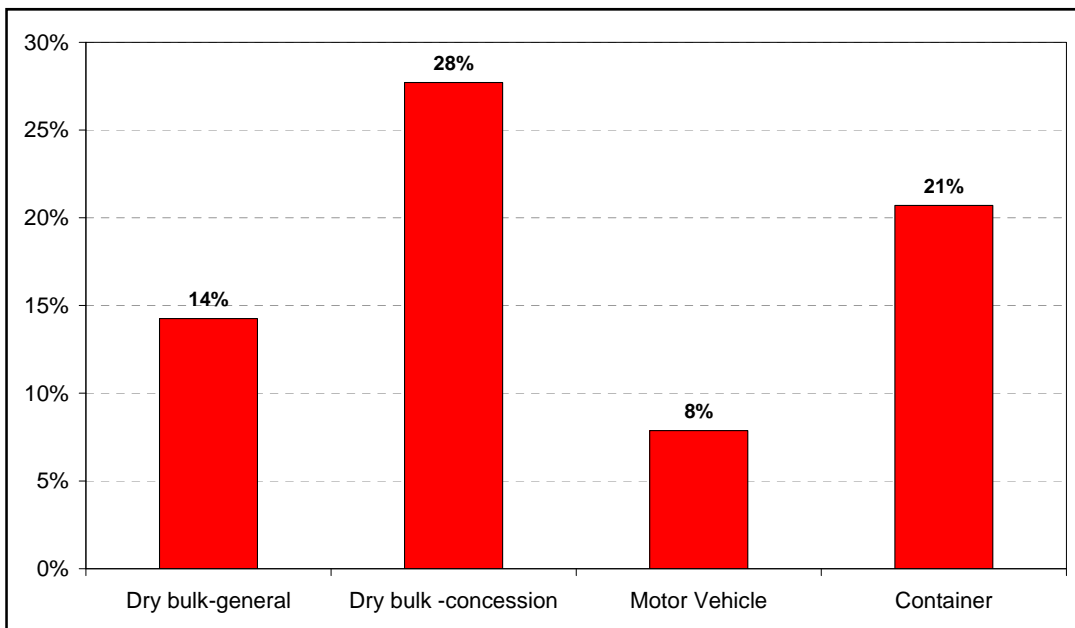
Figure 24: Increases in EMS charges by cargo sector, 2006 to 2011



Having established the commodity groups that appear to have underpinned the significant increase in non SA port charges (relative to increases in SA port charges) over the past five years, the question is do these commodity groups have a significant weighting in their contribution to the overall increase in charges at non SA ports? If the answer is yes then this provides indicative evidence in support of the argument that berth infrastructure and ship loading investments at non SA ports may provide a reasonable explanation to why charges at non SA ports have grown at a substantially faster pace than SA ports over the past five years.

Figure 25 sheds some light on this question. It displays the volume weights for those commodity groups which recorded the highest increases in charges between 2006 and 2011. The average volume weight is shown, i.e. average of SA and non SA ports.

Figure 25: Selected cargo shares of total trade across SA and non SA ports, 2011



Taken together, the sum of the dry bulk (general and concession), container and motor vehicle weights in Figure 25 is approximately 70% of total port volumes. This suggests that substantial increases in unit charges (to cover for port investments/expenditures on bulk, container and motor vehicle berthing infrastructure and ship loading equipment at non SA ports) are important because they translate into substantial increases in overall charges at non SA ports.

This hypothesis is generally consistent with the evidence pointing to a number of non SA ports having undertaken substantial upgrades and expansions to port capacity (to cope to above trend growth in volumes) over the past five years. In the cases of dry bulk (both concessional and general) cargoes, these upgrades/expansions are likely to have been funded with above annual CPI increases in unit charges for the use of port facilities at Gladstone, Townsville, Fremantle and Geraldton, while Port Kembla is likely to recorded above annual CPI growth in charges to recover the cost of constructing a new motor vehicle berth.

At the same time as a number of non SA ports have needed to fund their capacity expansions through higher charges in order to meet strong trade volume growth, SA ports do not appear to have undertaken capacity expansions to the same extent as non SA ports. This fundamentally reflects softer growth in total SA trade volumes relative to non SA ports. This, in turn, has meant that SA port charges have moved broadly in line with inflation over the past five years.

- ▶ This is an important point since this analysis does not imply that Flinders Ports may be using its position (as the only operator of proclaimed ports in SA) to run down its infrastructure asset base by not undertaking capital upgrades. Rather, it is a case of differences in magnitude, with Flinders Ports likely to have adopted a more modest capital investment program at its ports over the past five years compared to the operators of non SA ports. This is quite a reasonable and sensible approach by Flinders Ports because its level of capital expenditure (and its flow-through impact to SA port charges) should fundamentally be determined by actual and forecast growth in SA trade volumes.
- ▶ To this end, Flinders Ports has published a Masterplan for its Port Adelaide facility. This Masterplan lists the progressive and gradual nature of infrastructure upgrades that it plans to undertake in response to forecast growth in trade volumes. The scale and construction cost of these upgrades will determine the rate at which Port Adelaide ship visit charges Adelaide will increase vis-à-vis inflation.

Overall, the results of this benchmarking analysis suggest that the bulk commodities boom (which has primarily occurred in Queensland and Western Australia) over the second half of the 2000s appears to have contributed markedly to the above-CPI rate of increase in ship visit charges experienced at non SA ports over the past five years, while increases in ship visit charges at SA ports have exhibited broadly benign behaviour over the same period.

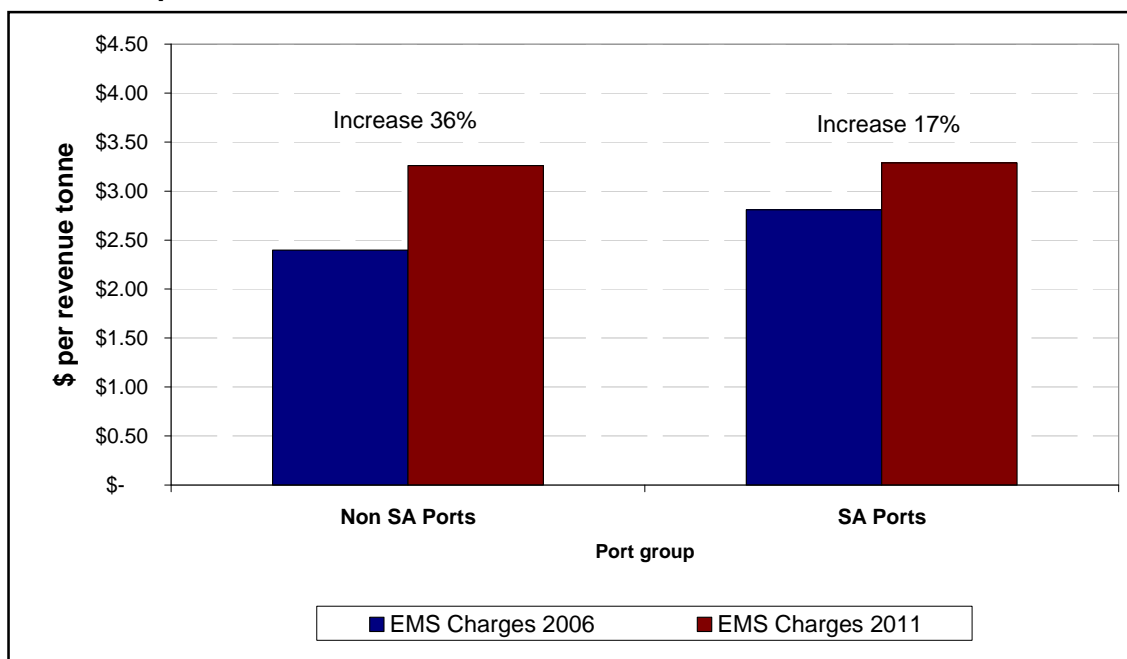
6. Conclusions

There are two important findings to come out of this 2012 benchmarking study of SA port charges against those of 12 non SA ports.

The first finding is that SA port prices were moderately higher than non SA port prices in 2011. Over seven commodity cargo groups, weighted average SA total port prices were 3.4% higher than weighted average total non SA port prices. On an EMS charges basis, SA port prices were marginally (around 1%) higher than non SA port prices in 2011. While SA port prices are slightly higher than average they are within the reasonable range as inferred from the spread of prices charged at other Australian ports. The reasons for port prices being higher at SA ports are likely to be lower economies of scale relative to certain non SA ports, challenges posed by operating a number of remote regional SA ports that have narrower trade bases and stronger rate of return considerations at SA ports.

The second finding is the analysis indicates a substantial narrowing of the gap between SA and non SA total port prices over the five year period from 2006 to 2011. On an EMS charges basis, SA total port prices were around 17% higher than non SA port prices. This differential narrowed to only 1% in 2011. This is highlighted in Figure 26, which shows non SA port prices increasing by 36% over the five year period, while SA port prices only increased by 17% (or at around the same rate of general inflation) over the same period. The significant reduction in the SA port price premium over non SA port prices over the past five years is likely to be attributable to the impact of stronger trade volume growth at non SA ports compared to that experienced at SA ports. This has required a greater degree of capital expenditure at non SA ports relative to SA ports, which in turn, is likely to have translated into greater increases in port charges (in order to recover the capital expenditure) at non SA ports compared to SA ports.

Figure 26: Level and changes in EMS port charges from 2006 to 2011, SA and non SA ports



In summary, the benchmarking results indicate that the combination of market pressures and current regulatory arrangements appears to have been effective in protecting the interests of South Australian port users. There is no evidence of excessive price increases at SA ports.

Appendix A

Factors affecting port price levels

Factors affecting the level of port costs:

Category	Factor	Description
(Largely) uncontrollable factors affecting the level of port costs	Location factors	The specific geographical characteristics of a port location exercise an important influence on port costs. The most obvious example is whether the port is sited close to natural deep water, but there are many others, including the proximity to major urban areas.
	Scale factors	It is generally accepted (though surprisingly hard to demonstrate empirically) that there are important economies of scale in ports, and particularly in the provision of the basic infrastructure services that comprise the bulk of the Essential Maritime Services defined by the MSA Act.
	Cargo mix factors	The mix of cargoes handled by the port also has an important influence of port prices. Some cargoes require much more sophisticated berth infrastructure than others.
(Largely) controllable factors affecting the level of port costs	Capacity utilisation	There are high fixed costs involved in the provision of essential maritime services. Port operators make choices about how much capacity to provide in the face of a certain level of demand, and the level of utilisation of major port assets has a very significant impact on port costs.
	Ship size	Port operators also make choices about the size of ship for which they will cater. Catering for larger vessels involves higher port costs, but may provide significant benefits for port users.
Factors affecting the relationship between the overall level of port prices and port costs	Asset valuation policies	Asset valuation practices do not affect the cost of providing the port assets, but they do have a very marked effect on pricing targets. The approaches taken by different ports vary significantly. In the case of the SA ports, a discontinuity was introduced by the sale process, at which time the port assets were transferred at a price that differed significantly from the book value.
	Rates of return	Most publicly owned Australian ports, most of the time, achieve rates of return on assets that are below those that would normally be considered commercially acceptable.

Category	Factor	Description
Factors affecting charges incurred by specific port users	Cost/profit centre structuring	Some models of port pricing — perhaps the best known of which is the UN ESCAP Model Port Tariff, the influence of which is muted but perceptible in the pricing structure inherited by Flinders Ports from South Australian Port Corporation — propose the recovery of certain identifiable costs from specific charges. In practice, there is very little consistency between ports in this regard.
	Cost allocation procedures	Particularly in complex urban ports, a significant share of total costs —commonly up to 50% of total costs — cannot be directly attributed to any particular trade passing through the port. The allocation of these costs to particular users is therefore essentially discretionary. Some ports go about this differently, and many do not do it systematically at all. The choices that are made in this regard by the port operator can significantly influence the prices charged to particular users.
	Price structures	For cargo-based charges, the charging unit is generally common across most ports: the revenue (or freight) tonne for non-unitised cargoes, per TEU for containerised cargo or per unit for cargoes such as vehicles and livestock. But the relationship between charges for different cargo types, even where these may pass across the same wharf, can vary significantly. Specific cargoes may enjoy advantageous rates in a particular port because of specific agreements arrived at with individual shippers but incorporated in the port tariff, or for a number of other reasons. Ship-based charging structures also differ. Sometimes they are very simple (e.g. Melbourne, Geelong), with a flat rate per GT; sometimes they are simple, but vary between locations in the port (e.g. Fremantle). Alternatively they follow a complex profile that reflects certain historical breakpoints and agreements (e.g. Newcastle); sometimes they include an element that reflects the time a vessel spends in port (e.g. Darwin); sometimes they cover the ship for several visits during a defined period (e.g. South Australia).

Appendix B

Computing overall price indicators

The computing of the overall price indicators (composite indices) in the modelling work was undertaken as follows:

Step 1: Notation

Let v_{ij} be the volume, in revenue tonnes, of cargo of type 'i' through port 'j'. Let p_{ij} be the port charges, per revenue ton, incurred in shipping cargo of type 'i' through port 'j'.

Define two sets of ports, S and O, where S is the set of South Australian ports, and O is the set of other ports. That is, if $j \in S$, then j is a South Australian port, and if $j \in O$, then j is a non-South Australian port.

Let P_{iS} be the representative price of moving cargo of type 'i' through South Australian ports, and P_{iO} be the representative price of moving cargo of type 'i' through non-South Australian ports.

Let V_{iS} be the total volume of cargo of type 'i' through South Australian ports, and V_{iO} be the total volume of cargo of type 'i' through non-South Australian ports.

Let W_{iS} be the share of cargo of type 'i' in the total cargo through South Australian ports, and W_{iO} be the share of cargo of type 'i' in the total cargo through non-South Australian ports.

Let P_S be estimator of overall price levels in South Australian ports, and P_O the estimator of overall price levels in non-South Australian ports.

Step 2: Computing the estimators of overall price levels

$$\text{Compute } P_{iS} = \frac{\sum_{j \in S} v_{ij} p_{ij}}{\sum_{j \in S} v_{ij}} \quad \text{and} \quad P_{iO} = \frac{\sum_{j \in O} v_{ij} p_{ij}}{\sum_{j \in O} v_{ij}}$$

$$\text{Compute } W_{iS} = \frac{\sum_{j \in S} v_{ij}}{\sum_{j \in S} \sum_i v_{ij}} \quad \text{and} \quad W_{iO} = \frac{\sum_{j \in O} v_{ij}}{\sum_{j \in O} \sum_i v_{ij}}$$

The overall price indicators are then constructed as the geometric mean of two estimators calculated using these P_{iS} , W_{iS} , P_{iO} , W_{iO} values. One of these estimators is calculated by applying the W_{iS} weights to both sets of prices; the other is calculated by applying the W_{iO} weights to both sets of prices.

$$P_S = \sqrt{\left(\sum_i W_{iS} P_{iS}\right) \left(\sum_i W_{iO} P_{iS}\right)}$$

$$P_O = \sqrt{\left(\sum_i W_{iS} P_{iO}\right) \left(\sum_i W_{iO} P_{iO}\right)}$$

Appendix C

List of data sources used

The following is a list of data sources used in the benchmarking analysis

Port charges data sources (from ESCOSA and port authority websites)

Port Name	Source
SA ports	
- Port Adelaide	<u>Provided by ESCOSA</u>
- Port Giles	<u>Provided by ESCOSA</u>
- Port Pirie	<u>Provided by ESCOSA</u>
- Port Lincoln	<u>Provided by ESCOSA</u>
- Thevenard	<u>Provided by ESCOSA</u>
- Wallaroo	<u>Provided by ESCOSA</u>
Non SA ports	
- Brisbane	<u>http://www.portbris.com.au/ShippingOperations/PortCharges</u>
- Bunbury	<u>http://www.byport.com.au/</u>
- Fremantle	<u>http://www.fremantleports.com.au/Operations/Pages/Rates-and-Charges.aspx</u>
- Geelong	<u>http://www.geelongport.com.au/downloads/Final%20GeelongPort%20Tariff_Effective%201st%20July%202011.pdf</u>
- Geraldton	<u>http://gpa.wa.gov.au/Port_Fees_Charges.aspx</u>
- Gladstone	<u>http://www.gpcl.com.au/OperationsDevelopment/Shipping.aspx</u>
- Melbourne	<u>http://www.portofmelbourne.com/shipping/tariffsandcharges.aspx</u>
- Newcastle	<u>http://www.newportcorp.com.au/site/index.cfm?display=111639</u>
- Port Kembla	<u>http://www.portkembla.com.au/page/port-business/price-schedule/</u>
- Sydney	<u>http://www.sydneyports.com.au/data/assets/pdf_file/0016/16036/Schedule of Port Charges Including Pilotage From 1 July 2011.pdf</u>
- Portland	<u>http://www.portofportland.com.au/2011-12-port-charges.html</u>
- Townsville	<u>http://www.townsville-port.com.au/account_enquiries</u>

Other port charges sources (primarily from private towage, pilotage and mooring service operators)

Port Name	Source
SA ports	
- Port Adelaide	Svitzer Australasia
- Port Giles	Svitzer Australasia
- Port Pirie	Port Lincoln Tugs Pty Ltd
- Port Lincoln	Port Lincoln Tugs Pty Ltd
- Thevenard	Port Lincoln Tugs Pty Ltd
- Wallaroo	Port Lincoln Tugs Pty Ltd
Non SA ports	
- Brisbane	Transport Operations (Marine Safety) Regulation, pg 265 (Maritime Safety Queensland), Svitzer Australasia
- Bunbury	http://www.byport.com.au/
- Fremantle	Svitzer Australasia
- Geelong	Svitzer Australasia
- Geraldton	http://gpa.wa.gov.au/Port_Fees_Charges.aspx
- Gladstone	SMIT Marine Australia
- Melbourne	Svitzer Australasia
- Newcastle	Svitzer Australasia
- Port Kembla	Svitzer Australasia
- Sydney	Svitzer Australasia
- Portland	http://www.portofportland.com.au/2011-12-port-charges.html
- Townsville	PB Towage

Port trade volumes data sources (from port authority and Ports Australia websites)

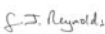
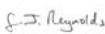

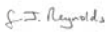

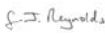
Port Name	Source
SA ports	
- Port Adelaide	http://www.flindersports.com.au/portstatistics2.html
- Port Giles	http://www.flindersports.com.au/portstatistics2.html
- Port Pirie	http://www.flindersports.com.au/portstatistics2.html
- Port Lincoln	http://www.flindersports.com.au/portstatistics2.html
- Thevenard	http://www.flindersports.com.au/portstatistics2.html
Non SA ports	
- Brisbane	http://www.portbris.com.au/LinkClick.aspx?fileticket=uPWfHdYz6rE%3d&tabid=146
- Bunbury	http://www.byport.com.au/
- Fremantle	http://www.fremantleports.com.au/Operations/Trade/Statistics/Documents/Statistical%20Information%202010-2011.pdf
- Geelong	http://www.portsaustralia.com.au/tradestats/
- Geraldton	http://gpa.wa.gov.au/comparative_trade_statistics.aspx
- Gladstone	http://www.cqpa.com.au/viewcontent/ShippingStatistics/CargoComparisonsSelection.aspx
- Melbourne	http://www.portofmelbourne.com/shipping/tariffsandcharges.aspx , http://www.portsaustralia.com.au/tradestats/
- Newcastle	http://www.newportcorp.com.au/site/index.cfm?display=111694
- Port Kembla	http://www.kemblaport.com.au/page/port-operations/trade---cargo/
- Sydney	http://www.sydneyports.com.au/data/assets/pdf_file/0003/16167/June_2011_Trade_Stats_Bulletin_v1_0_25_July_2011.pdf
- Portland	http://www.portsaustralia.com.au/tradestats/
- Townsville	http://www.townsville-port.com.au/files/webstats/1011/WebStats%20Trade%202001_2002%20to%202010_2011.pdf

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