2004 Review of Part X of the Trade Practices Act 1974

A Discussion Paper on Issues relating to Shipping Economics

A submission to the Productivity Commission

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Contents

Boxes, figures, tables and charts

1 Introduction

This economic discussion paper was commissioned by Shipping Australia, representing many of the shipping companies providing liner (ie scheduled non-bulk) services to and from Australia. It provides an independent assessment of the key practical and economic issues that arise in relation to the Productivity Commission's 2004 review of Part X of the Trade Practices Act 1974, concentrating especially on developments since the Commission's last review in 1999.

Although the review's timing was determined five years ago it has been brought forward a year, apparently because of controversy about liner shipping rates between China and Australia – an issue addressed in this paper.

The paper draws on the experience of the two companies that prepared it (ACIL Tasman, economic consultants, and Thompson Clarke, shipping consultants), papers prepared at the time of the last Productivity Commission review, papers (largely overseas) produced since that review, papers generated by the recent ACCC review, and discussions with Shipping Australia.

The structure of the paper is:

- background: the brief history of cooperative liner shipping arrangements, Australian policies covered by Part X of the Trade Practices Act, and the recent ACCC review;
- the current state of liner shipping: recent developments in trade volumes, shipping companies, scheduling, pricing and investment – generically and by trade;
- the economics of liner shipping (characteristics of the industry, and theoretical considerations); and
- future policies.

2 Background

2.1 Brief History

Early conferences or "shipping rings" were a response to the shipping glut caused by the opening of the Suez Canal in 1869 which shortened major shipping routes, and the development of steam power which added to capacity by increasing ships' speed, reliability and size. The glut had led to desperate commercial practices which undermined reliability, such as delaying ships to get more cargo[1]. By the early 20th century liner conferences had become widespread on main shipping routes and have remained the norm since, despite the disappearance of the initial excess-capacity trigger and the move to containerisation. As trade practices (or anti trust) policies developed, exemptions were provided to shipping conferences.

In Australia competition became fierce from1929 and rates declined to a point where services were potentially under threat unless rates increased substantially – to which shippers objected strongly. However, following a conference convened by the Prime Minister a formula evolved for freight rate increases – arguably a worse outcome for shippers because of the cost-plus aspect. This lasted until the late 1950s. More recently conferences have been exempt from competition legislation. The exemption was clarified in 1966 with the introduction of Part X of the Trade Practices Act legislating that all registered liner shipping conferences were exempt from the general competition rules. Since 1966, there have been four major reviews of Part X (1977, 1984, 1993 and 1999). The reviews have led to amendments to Part X in 1989 and 2000.

2.2 Previous Productivity Commission Review

The Productivity Commission's review in 1999 concluded that:

> The benefits to Australian shippers (and hence the community overall) of allowing conferences and other cooperative arrangements to operate exceed any costs … The Commission therefore concludes that … Part X should be retained.

The Commission's conclusions, which were firm and unequivocal, were based on analysis of the underlying economics which, as discussed later in this paper, are broadly similar today.

[1] Productivity Commission 1999.

The Commission recommended amendments to Part X and these were implemented in 2000. The amendments included:

- Providing Australian importers with similar but not exactly the same rights as Australian exporters in respect to negotiations with inward conferences (importers are restricted to negotiating rates for eligible contracts concluded in Australia only and not overseas);
- The increase in powers of the ACCC to initiate investigations;
- Limitations to the scope for closed conferences to exclude entry; and
- The introduction of more flexible penalties for breach of undertakings.

2.3 Part X, Trade Practices Act 1974

Part X of the Trade Practices Act provides an industry-specific regulatory regime for the operation of international liner cargo shipping in Australia. Under it, the providers of liner cargo shipping services to Australian exporters and importers are permitted to cooperate and form conferences, discussion agreements etc for the provision of those services. Through compliance under Part X, providers are exempt from some general provisions of the Trade Practices Act – notably on capacity, services and prices – which would otherwise apply to such potentially anti-competitive arrangements.

2.4 ACCC Inquiry

In October 2003, the ACCC announced that it would investigate the Asia – Australia Discussion Agreement (AADA) in response to several complaints by importers, freight forwarders and business associations about a rapid rise in southbound import container freight rates from East Asia to Australia.

The ACCC's main function in relation to international liner cargo shipping is to investigate complaints in the context of the exemption via Part X of the Trade Practices Act 1974 for Liner Shipping Conferences, Trade and Rate agreements.

The purpose of the 2004 ACCC investigation was to report to the Australian Minister for Transport and Regional Services whether or not there were sufficient grounds to recommend deregistration of the AADA.

An ACCC Issues Paper was published in November (ACCC, 2003) to which there were 11 public responses. In April 2004, ACCC published a Position Paper (ACCC, 2004a) with a preliminary conclusion that exemption under part X should be abolished. The Asia Australia Discussion Agreement (AADA), via SAL, responded to this paper in the same month together with 5 other parties (Shipping Australia, 2004) pointing out that much of the ACCC's argument

was based on supposition and that there was a range of facts and industry practices which were inconsistent with the Commission's assertions.

This response appears to have been effective: in July 2004 the ACCC released its report to the Minister for Transport and Regional Services (ACCC, 2004b), stating that it

> has been unable to separately establish the effect of the AADA agreement in delaying investment in additional shipping capacity… from the broader market conditions of a global dearth of supply and increased charter rates… [and] considers that recent entry and service expansion of the North East Asia - Australia liner trades will reduce the likelihood that the AADA could be used to constrain capacity or rapidly increase freight rates in the immediate future.

The Commission concluded that it could not recommend to the Minister that grounds existed for him to make a direction under section X to cancel registration of the AADA. However the chairman of the Commission suggested that the legislation be changed so that the onus of proof was on those seeking exemption [ie the shipping lines] rather than on those seeking to show anti-competitive conduct [ie the ACCC][2]. The chairman's suggestion is addressed later in this paper.

2.5 Current Productivity Commission Inquiry

Subsequently, and apparently in part response to importer concern on this issue, in June 2004 the Commonwealth Treasury directed the Productivity Commission to undertake, and complete within 6 months, a review of Part X of the Trade Practices Act (1974) and associated regulations (this review had originally been scheduled for 2005).

The Commission began the review process with the publication of an Issues Paper (Productivity Commission, 2004a) and the invitation for public submissions.

The issues paper outlines the background and scope of the inquiry and highlights issues on which the Commission seeks information and comment. It notes that there have been several significant changes in international competition policy in relation to liner shipping. Legislative changes have occurred in the United States, Canada, Japan, Korea and the European Union. The Commission asked what implications the recent international reforms have for Australia and the Part X exemption.

The Productivity Commission, sourcing from UNCTAD and the ACCC, noted that there have been "substantial increases" in freight rates, "in

[2] Lloyd's List Daily Commercial News 20 Jul 2004

December quarter 2003, increases ranged between 50 and 90 percent". (A fuller assessment of rates is provided later in this paper).

The Commission notes that, with the growing sophistication of financial markets, there has been a considerable increase in the contractual mechanisms available, such as hedging, to deal with operating in risky markets. The Commission asks whether the recent market and technological changes impact the argument for or against Part X exemptions.

The Commission has been asked to identify alternatives to Part X. The main alternative is utilisation of Part VII of the TPA, whereby each arrangement or conference would have to be reviewed on a case-by-case basis. The Productivity Commission asks whether there are any other alternatives to Part X (the main one being prior case by case approval under Part VII of the Act) or, if Part X is to be retained, there are any amendments that could be made to improve the regulation.

3 Liner shipping: recent developments and current position

Liner shipping services have developed since the Commission's last review in 1999. This chapter provides information on the main services to and from Australia – the trades, their volumes, the shipping companies involved, scheduling, pricing and capacity/investment – and related industry changes.

3.1 Trade volumes

In the latest fiscal year (2003/4) Australian ports handled 3.9m international TEUs. This represents less than 2.5% of the world marine container market, estimated by Drewry Shipping Consultants on a terminal throughput basis as about 273m TEUs in 2002 and likely to have been around 300m in 2003.

3.832m TEUs moved via the five major container ports of Melbourne, Sydney, Brisbane, Adelaide and Fremantle. These ports combined reported a growth of 8.8% on 2002/3 and since 1999 have recorded a compound growth p.a. of just over 8%. However of the outgoing containers some 36% or over 1 in 3 departed Australia empty. Of the full export containers refrigerated/chilled cargo accounted for nearly 14% of the total. This cargo, and therefore related equipment, inbalance and the relatively high proportion of reefer containers required for exports v. East West trades make it difficult to service economically.

Australia's container trade is dominated by 6 geographic areas, which in descending order of importance (2003/4 data from 5 main ports) are:

Table 1 **Geographic Areas**

Trade Route	Total TEUs 2003/4	% share of Total TEUs	5 yr % inc. p.a (cargo only)	Cargo Exp:Imp Ratio
East Asia	964,000	25	+11.7	0.32:1
SE Asia	743,000	19	+4.5	0.68:1
Japan/Korea	490,000	13	+2.5	1.74:1
Europe	463,000	12	+5.7	0.31:1
New Zealand	367,000	10	+6.7	1.07:1
N. America	247,250	7	+2.0	0.5:1

The volumes and percentage share above relate to total TEU movements (full and empty) while the growth rates and export/import ratios relate to full containers.

Details of the growth of full container traffic in these 6 trades, which account for 86% of Australia's overall international container movements, are given graphically in Annex 1. Setting aside yearly fluctuations, most trades have been steady or have had modest growth. East Asian cargo, largely driven by the development of China, has increased nearly 12% p.a. since 1999, and imports by 18% p.a. Last year China's total container trade with Australia (full and empty) grew 25% in a single year to some 532,000 TEUs, the largest single national trade partner in TEUs terms, some 40% greater than the next largest, New Zealand.

All but the New Zealand trade suffer from severe imbalances in cargo flows, with 3 full import TEUs moving for every one full export in the European and East Asian trades, and close to 2 full export boxes moving to Japan and Korea for every import to Australia. For the North American and SE Asian trades the imbalance is again in favour of imports, where in the case of the former the volume of full import containers is twice that of full exports, and for the latter it is about 50% higher inbound than outbound. These cargo imbalances impose cost penalties on the operators.

3.2 Shipping companies serving Australia

On each of the main trades there are a substantial number of shipping companies, some in consortia and/or cooperative arrangements (Discussion Agreements – defined later) and some independent. As seen in Table 2 below,

the two largest trades (East Asia and SE Asia) have direct services from no less than 10 and 7 consortia/independent operators respectively. The four smaller trades enjoy between 2 and 4 consortia/operators. These consortia exclude transshipment and wayport or crossover operators (who offer space on services transiting the trade route in question).

Despite its small share of world container trade, 19 of the top 25 container shipping companies (who account for 80% of the world's container fleet capacity) offer services to Australia. This is partly in response to the demand from major global shippers (such as Sony, Hewlett Packard, Philips and Nestles) for global capability from their ocean carriers. The table on the next page illustrates the involvement of these 19 carriers in Australia's top 6 container trades, in order of global fleet size.

Table 2 **Carriers in order of global fleet size**

Company	East Asia	SE Asia	Japan/ Korea	Europe	New Zealand	North America
Maersk-Sealand	C	C	C	T/S	O	C & O*
MSC	C	O	C	O	C	T/S
Evergreen	O~	O	O~	T/S		
P&ONL	C	C	C	C	C	C
CMA CGM/ANL	C	C	C	C	O	C
APL	O	C	O	T/S		T/S
Hanjin	O&C#	O&C#	O&C#	T/S		
NYK	C	C	C	T/S		
Cosco	C		C			
China Shipping.	C		C			
OOCL	O	C	O	T/S		
K Line	C	C	C	T/S		
CP Ships	O	O	O	C	C	C
Zim	C	C	C	T/S		
MOL	C	C	C	T/S		
Hapag Lloyd	O	O	O	C	O	C
Hamburg Sud	C	O	C	C	C	C
Hyundai	C	C	C	T/S		
PIL	O	C	O	T/S	C	
TOTAL	**19**	**17**	**19**	**17**	**8**	**8**
% Non Conf.	**34**	**32**	**34**	**71**	**38**	**38**
Trade Consortia	**10**	**7**	**3^**	**2**	**4**	**3**

Source: Shipping Australia: * discussion group member to/from USWC & USEC, non conference member to/from both. ~ Evergreen is a non participating member of AADA; # Hanjin is a member of AADA and the TFA Southbound but not Northbound. ^ combine with East Asia

(C = member of conference/discussion agreement; O = non-member; T/S = transshipment, non member) ** Evergreen is a non-participating member of AADA. *** Hanjin is a member of AADA/non-member of TFA

There are a number of other smaller carriers involved in Australia's direct container services either as ship providers or slot purchasers as follows:

Fesco (NE Asia, Tasman and US West Coast)

Marfret & CHL (Europe and SE Asia – non conference for the latter trade)

Djakarta Lloyd (SE Asia & Europe – non conference for the latter)

MISC (SE Asia and Tasman)

RCL (SE Asia Trade)

Swire Shipping (Tasman & SE Asia trades – non conference)

For each of these major trades at least two of the top ten global carriers are participants while not being members of the relevant conference or discussion agreement (and in some cases significantly more – i.e. up to six). As a result in all six key trades at least one third of operators are independents. Of the top 10 carriers only P&ONL is a conference/discussion agreement member in all six trades.

In the East Asian & Japan/Korea trades (nearly 40% of Australia's overseas container trades by box volume):

- The only operational grouping (out of 10 consortia/services) that has survived from 1999 is the standalone Cosco operation
- Since 1999 four lines have left these two trades (Blue Star, Yang Ming, Cho Yang and Wallenius Wilhelmsen) and six have entered (APL, PIL, Hapag Lloyd, Hamburg Sud, Hyundai, and Lykes Lines). All but one of the departures was in the period 1999/2000 when the trades were a financial basket case and all but one of the entries has been in 2003/4, when thanks to southbound volumes and rates ex PRC the financial outlook has improved substantially.
- In response to the sharp surge in PRC traffic in 2003/4 five new services have been launched this year (two of which are replace existing services). The incremental services have added some 25% or 210,000 net additional nominal slots to the capacity on the trade in each direction.

This operating environment is not one in which commercial terms in general and prices in particular could readily be managed to the disadvantage of exporters and importers. Nor is it an environment that enables collusive control of capacity to keep prices up – instead, increasing prices had the competitive market effect of leading to an increase in capacity.

3.3 Scheduling

The principal effect of the cooperative arrangements among shipping companies is that they collectively offer a frequent and regular service, which since the 1998 reform of the Australian waterfront, has resulted in fixed berth windows for weekly services, essential to customers operating JIT supply chains. Any one ocean carrier would have difficulty in providing this. As examples from Australia's 2 most important container trades in volume terms (accounting for almost 45% of total container trade), we reproduce below the current schedule for the Melbourne – Hong Kong route, which is repeated each week, and the Melbourne – Singapore route.

Table 3 **Indicative Weekly Schedule – Melbourne to Hong Kong (Aug 2004)**

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Direct Services							
COSCO						x	
NEAX			X				
NCA						x	
ACX					X		
Fesco/HMM/HSd						x	
Maersk/MSC		x					
ACX	x						
AANA			X				
Major Trans-shipment Operators (over Singapore)							
AAA		x					
AAX				X			
AAA				X			

Source: Daily Commercial News and Shipping Company websites

Table 4 **Indicative Weekly Schedule – Melbourne to Singapore (Aug 2004)**

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Direct Services							
AAX			x				
AAA		x					
ASA		x					
Major Wayport Operators (to Europe or North Asia via Singapore)							
Aela				X			
MSC				X			
Wallenius Wilhelmsen							x
Transhipment Operators (via Asia)							
Maersk			x				

Source: Lloyd's List/Daily Commercial News and Shipping Company websites

In both these trades there are effectively daily sailings to/from both Sydney and Melbourne, which ports account for about 2/3 of the relevant markets. For the other four major trades (Japan/Korea, Europe, Tasman and North America), there are at least 3 sailings a week (the equivalent of every other day).

The competitive importance in export markets of this berth coverage by the container services on offer is self evident for Australia's perishable or reefer exporters (meat, horticulture and dairy); it is no less critical for both general cargo exporters whose customers rely on a continuous pipeline of product (eg cereals in containers and aluminium), or importers of retail goods.

3.4 Pricing

The four graphs below detail the changes in average ocean (blue water) freight rates paid by exporters and importers (contract and other) per TEU in the six main Australian trades over the last five years. These are indexed on equivalent rates prevailing in 1999 (export dry and reefer, import dry – and in the case of New Zealand only reefer as well). The data source is Shipping Australia Ltd.

Chart 1 **Trade Rates PRC & Japan**

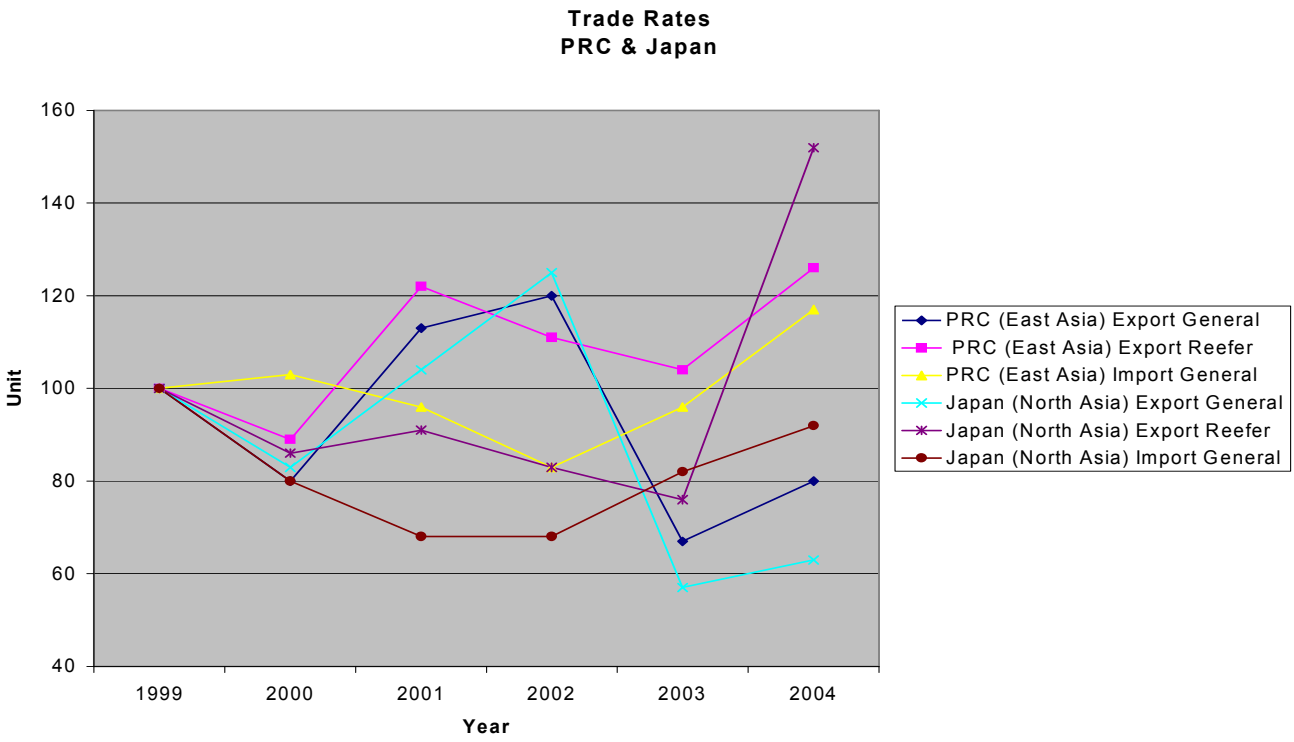


Chart 2 **Trade Rates – SE Asia & Europe**

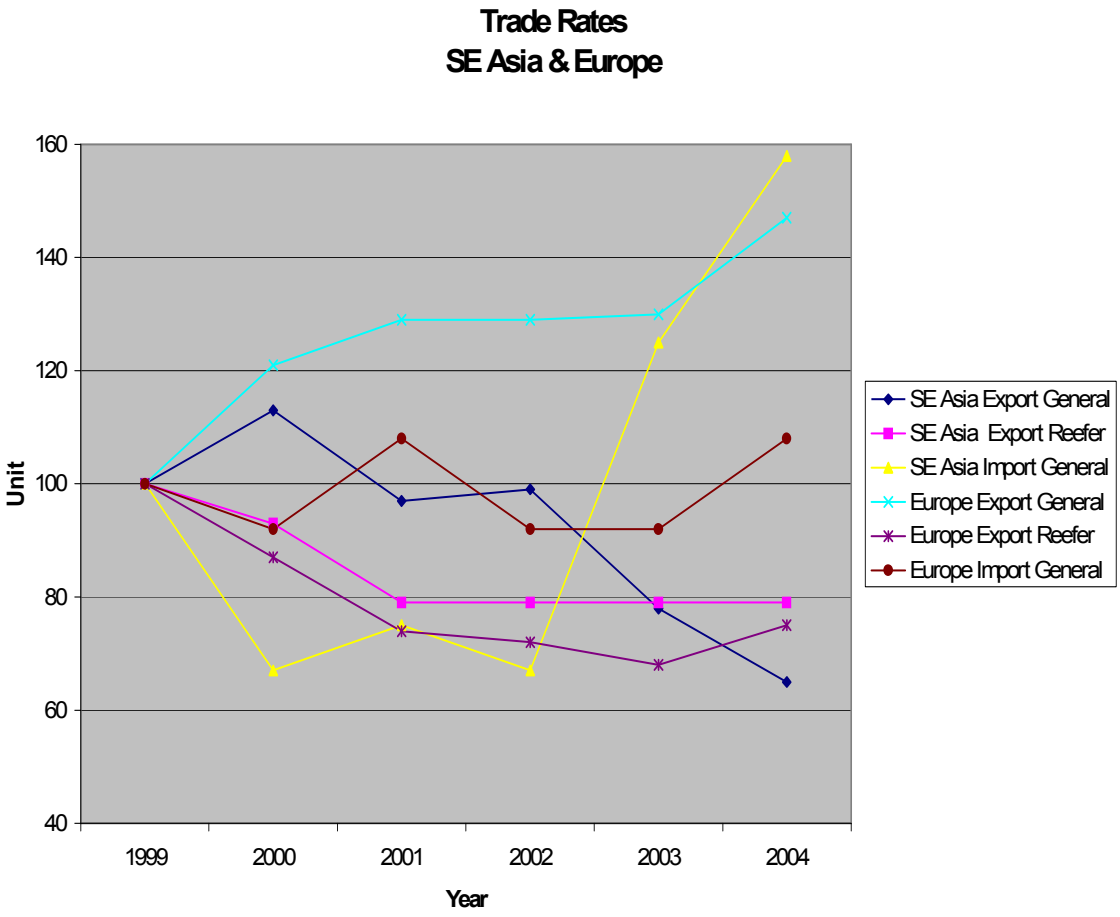


Chart 3 **Trade Rates – New Zealand**

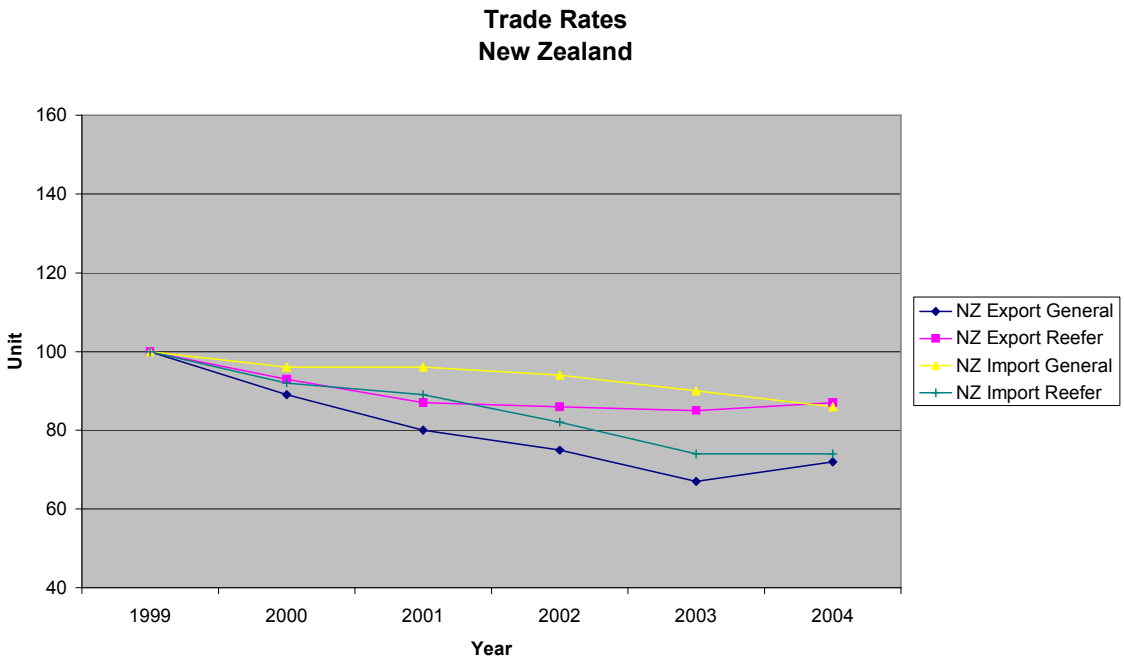
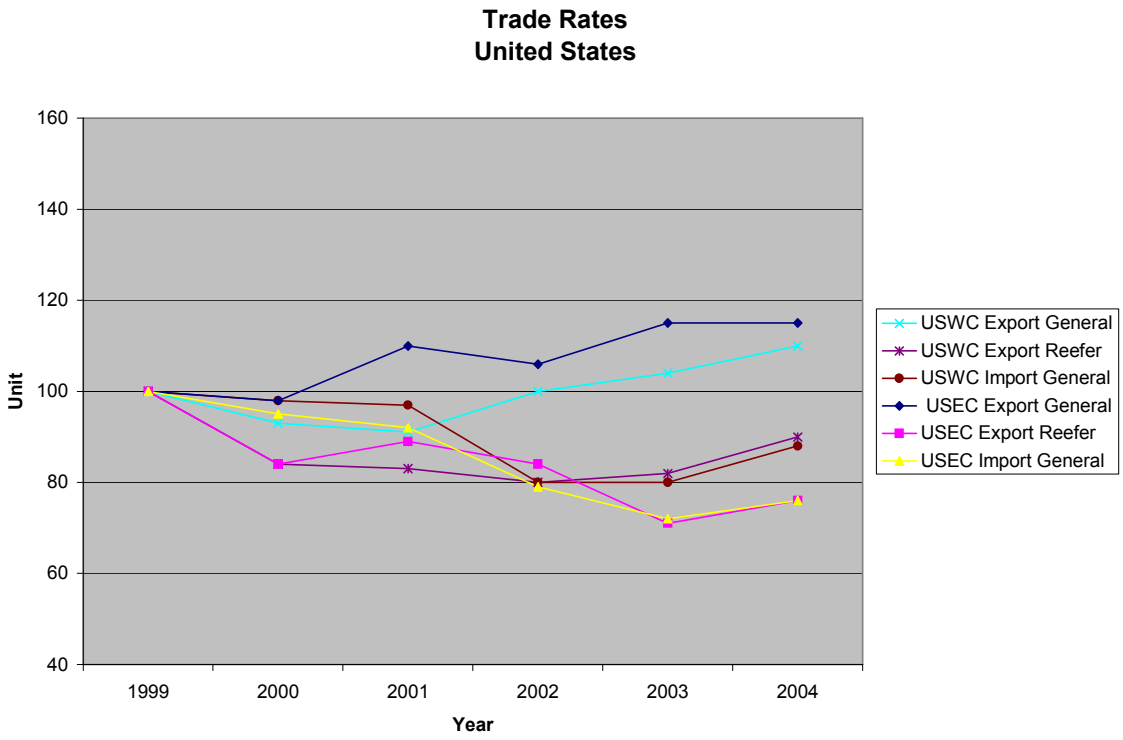


Chart 4 **Trade Rates – United States**



These indices are not based on headline rates, which, like hotel rack rates or official air cargo rates, are paid by very few customers. 12 out of the 22 different rates tracked declined in the period. A further four only escalated at a rate close to the targeted Australian annual inflation rates (2 – 3%). This included the inbound rates from East Asia that increased 3.2% compound over the period, in stark contrast to the ACCC reports of 100% increase over the last 12 months of headline rates from PRC. In excess of 80% of cargo on this route (as elsewhere) moves on contract, not at headline or official rates. Of the remaining 6 routes, only 3 advanced substantially:

- Imports from South-East Asia – 9.6% p.a. where volumes increased 43 % in the period (and all of this in the last 2 years), thus placing major pressure on capacity in a trade where exports, whose volume in 1999 was almost the same as imports, grew only 5% over 5 years to create a major trade imbalance.

- Refrigerated exports to Japan/Korea – 8.7% compound where rates actually declined until 2004. This sudden lift was due to the unexpectedly strong growth in meat exports to North Asia (in excess of 30% in 2004 to date to both Japan and Korea), where US meat imports were banned due to BSE contamination in its domestic herd. Export meat prices to this region increased similarly, as demand for Australian beef soared and again exacerbated what was already a serious equipment imbalance in the trade.
- General Cargo Exports to Europe – 8% p.a. over the last 5 years. These rates were substantially lower at the start of the period than other long haul rates, and the increase compensated in part for the major erosion over this period of the trade's critical export reefer rates (over 5% p.a. compound).

3.5 Capacity and Investment

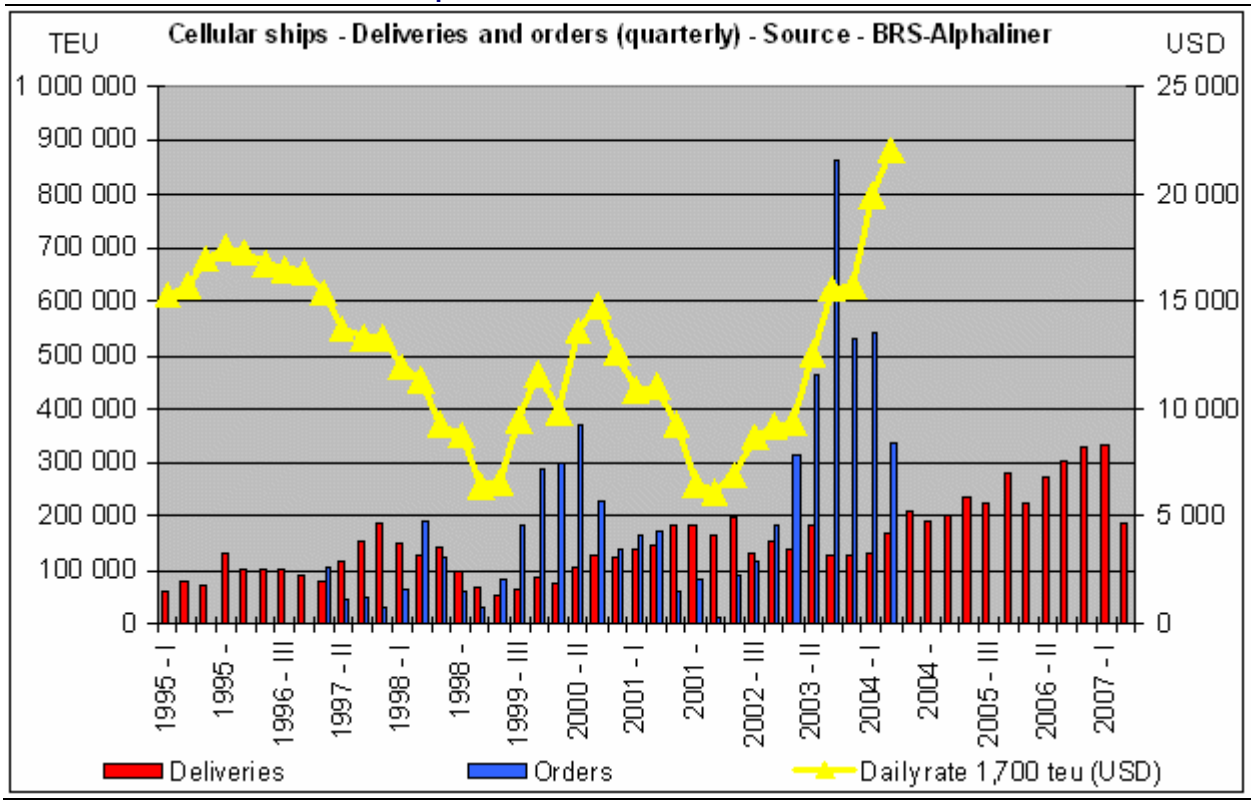
As this section discusses, the container ship charter market has been very tight for the last two years, but price signals have nevertheless led to increased capacity on the routes with strong growth in demand.

The major change in container capacity offered on Australian trade lanes in the last five years has been part of a rationalization of the US East Coast and European trades. In 2002, other than the services offered by MSC and the transshipment operators over SE Asia, all these services were organized into 2 counter-rotating Round the World services spearheaded by P&ONL, CP Ships & CMA/CGM. The Eastbound service has been provided by 10 dedicated newly built 4,100 TEUs Panamax vessels with some 1300 reefer plugs – a vessel investment of around US$0.5b, with a financial commitment on reefer containers (20 and 40 foot) adding a further $0.25b, since these vessels replaced the outmoded vessel porthole airblown refrigeration systems. At the time they boasted the largest reefer container capacity of any container vessel operating. This development was a quantum leap in size for vessels dedicated to the ANZ trades where the previous largest vessels were around 3,000 TEUs.

The Westbound service was provided by 12 smaller (2,500 TEUs) vessels of varying types and specifications, that were already in service with member carriers. This service poses major issues for the ports of Melbourne, Adelaide and Fremantle whose approach channels are inadequate to cater for the draft of the vessels deployed when fully laden and moving at low tide. The same is true for the Eastbound service in Melbourne.

In other trades, tonnage provision has been much more evolutionary and frequently with the use of chartered vessel (e.g. USWC 12 out of 13 or 92% of vessels deployed), whose availability and price has varied significantly as a result of world industry trends. Chart 1 shows ship orders and deliveries, and ship charter rates for typical ship sizes (1700 TEU is the traditional size serving Australia, but is now being progressively replaced by 2500 – 4000 TEU).

Chart 5 **Cellular ships**



Data source: BRS Alphaliner

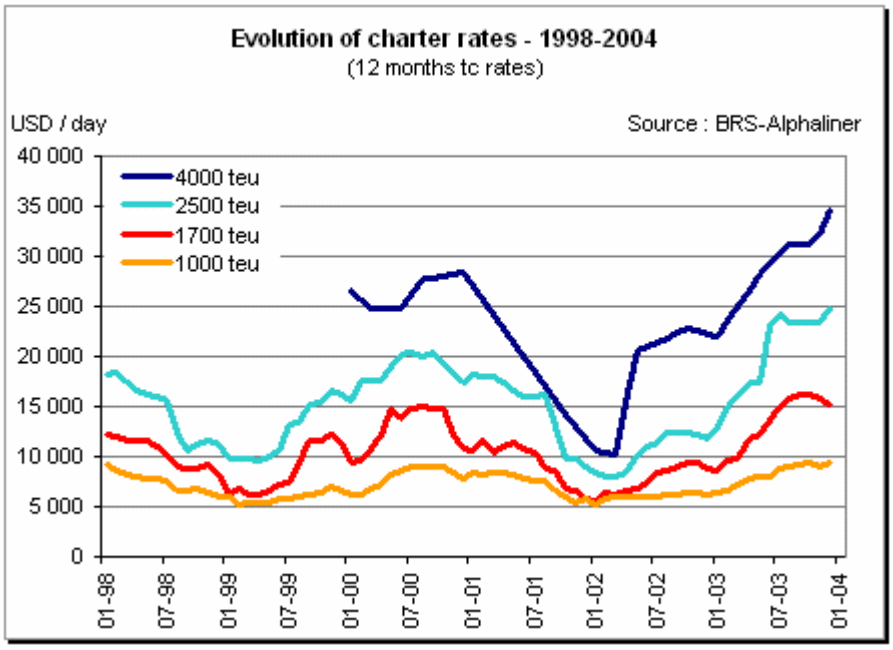
The following should be noted from Chart 1:

- In fiscal 2001/02, when freight rates worldwide were depressed, global orders for new vessels rarely exceeded 100,000 TEUs per quarter.
- However with the rise in trade in the second half of 2002 on the main East West container routes, particularly from East Asia, orders in the following five quarters soared to near 900,000 TEUs in Q3 2003, followed by over 500,000 TEUs of orders in the next 2 quarters and over 300,000 in Q2 2004.
- This trend has been accompanied by a dramatic rise in charter rates for container vessels of all sizes. The day rate for a traditional Australian

trade vessel size of around 1700 TEUs more than trebled in the last two and a half years, from just over US$5,000 per day to around $22,500 per day in Q2 2004. This implies a massive impact on costs – increasing vessel hire from under US$2m p.a. to over $7m per vessel. While most operators charter vessels for periods of more than 12 months, and so this impact is delayed, when their charter comes up for renewal there is no escape from such market forces.

Chart 2, which does not provide data beyond the end of 2003, demonstrates that this surge in charter rates was across all sizes of container vessel.

Chart 6 **Container Ship Charter Rates 1998 – 2004**



Data source: BRS Alphaliner

The trends on these charts are consistent with rising prices bringing forth increased supply but with a lag (during which prices can peak) – as would be expected in a competitive market.

However some 95% of the current world order book for container vessels (30/6/04) is for ships over 2,500 TEUs in size and 79% for ships over 4000 TEUs. In 2003 416 new containerships were ordered with a nominal capacity of 1.87m TEUs at a cost of US$23.7b. Clarksons estimate so far in 2004 a further US$10.6b of capacity has been ordered. This massive surge in containership capacity is bound to lead to a somewhat disorderly 'trickle

down' to Australia as the bulk of the new vessels will be placed in the major East – West trades between Asia and North America, Asia and Europe and Europe and North America. Some of the displaced vessels currently on those routes will be reallocated to the much smaller North South trades. MSC has already deployed 15 vessels in their European service with Australia/New Zealand in response to the two Round the World services introduced in late 2002, and has recently announced plans to progressively upgrade the vessel size in their service to as large as 6,700 TEUs, beginning with the progressive early introduction of vessels over 3,500 TEUs.

3.6 Industry Changes 1999 – 2004

This section reviews some of the key developments that have occurred in the liner container shipping industry since 1999, both globally and with particular application to Australia

3.6.1 Industry Consolidation

Since containerization in the 1970s liner shipping has rarely generated an attractive return on investment on a standalone basis. It is no accident that of the three US pioneering companies in this field (Sealand, Matson and APL) only Matson has not been taken over, primarily because of its near domestic monopoly in the Hawaiian trade. It was similar for the two British pioneering container consortia (OCL and ACTA)– the latter was absorbed into the former, and three of the founding partners in OCL progressively exited leaving P&O Containers as sole owner. It in turn merged with the Dutch group, Nedlloyd in 1995. All these consolidations were the result of inadequate financial performance.

In 1997 the ailing Singapore government owned group NOL acquired APL and the debt burden almost destroyed the combined Group in 2000. In 1999 the Danish container operations of Maersk acquired the US group, Sealand, at that time owned by CSX Corporation, to form the industry market leader. All these moves were inspired by the need for improved scale of operation and financial performance. The full impact of these mergers was still emerging in 1999 and with ongoing reports of further rationalization in the industry clearly did not resolve all the issues faced by a significant number of the leading operators.

CP Ships, which listed successfully in October 2001, after a steady program of niche acquisitions on a global basis, reported a 7.2% Return on Capital Employed (ROCE) for 2003, in a good year for the industry as a whole (and this before adjustments for accounting errors of some US$40m identified in the current year).

3.6.2 Ship Size & New Orders

Mention has been made in section 3.5 above of the trend to ever larger container ships. The majority of current orders with the world's shipyards are now post Panamax 4th generation container vessels in excess of 4000 TEUs.

The largest vessels now operating are 8,000 TEUs (OOCL and China Shipping), which have a 30 – 35% lower container slot cost than 4th generation 4,500 TEUs vessels, and on typical Transpacific trades (12 day transit @25 knots) can save up to US$4m per voyage in costs according to the American Association of Port Authorities (AAPA). However they require ever deeper port channels and berths (16m) and ever larger container terminals (the largest in Los Angeles when fully developed will be 196 hectares and gantry cranes with an outreach of 17 or 18 rows (capital cost US$5.5m – 6.5m each). And port stays are likely to increase to up to 4 or 5 days.

According to Clarksons container ship orders in TEUs terms as of June 2004 are the equivalent of 50% of current operating capacity. 5 years ago it was just 16%. It is estimated that 50 x 7,500 container ships (with a current price tag of around US$100m each) will be in service on the East West trades at the start of 2005 and this will have risen to 190 by the end of 2007. MSC alone has 29 on order out of a total order book of 291,000 TEUs of ship capacity, equivalent to 47% of its current fleet of 237 ships of 614,000 TEUs. In sheer vessel size Maersk heads the industry with its largest vessel (Adrian Maersk) 352m LOA, 43m beam, 109,000 DWT with a nominal capacity close to 10,000 TEUs.

3.6.3 Chartered v. Owned Tonnage

A byproduct of the jump in container ship size that has been in full cry for the last 2 years is the inability of carriers to take the full capital cost directly to their balance sheets. This has led to more and more of the current ship order book being generated by investors (often German KG companies[3]), against back to back charter agreements with operators. Clarksons, the UK shipbrokers, estimate that the percentage of container vessels chartered v. those owned by the top 30 operators, has shifted dramatically in recent years:

Early 1990s:	18%
2000:	40%

Their latest estimate is that it has risen to 45% currently and will be over 60% when the present container ship order book has all been delivered.

[3] German term for ships provided via tax loss driven investments by professionals – mainly doctors and dentists – under German tax law

Traditionally containership charters were for vessels of 2,500 TEUs or less and for periods up to 12 months. P&ONL, who is reported to have 80% of its fleet of 154 ships on charter, is understood to have one third of its charters for up to 2 years and the rest committed up to 10 years. The stakes in these contractual exposures are large and variable – Hapag Lloyd recently committed to US$32,000 per day for 6 year charters for 2 x 8,400 TEUs vessels, while P&ONL has committed US$38,500 per day for 3 sister ships over 10 years.

3.6.4 Transhipment Hubs

A further byproduct of this increase in vessel size is the fact that the operators of such tonnage will increasingly want to hub these extra large vessels on a minimum number of port calls. Singapore has for a number of years positioned itself as the premier hub port in SE Asia, with direct services to over 150 overseas ports and on major trade routes 2 or 3 sailings daily. 80% of its container throughput is transshipment traffic to/from regional services spanning Africa, the Middle East, South Asia, SE Asia, and Australasia. It handles either as local trade or transshipment some 25% of all Australia' s container imports and a typical mainline vessel will discharge and load containers to/from up to 50 different regional ports.

This capability, which is to a greater or lesser degree shared with other ports in the region (Port Klang, Tanjung Pelapas, HK, Kaohsiung and Busan) means that direct long haul services to/from Australia meet increasing intermittent competition from transshipment services when there is any short fall of cargo on their mainline services. This increases the volatility of demand for direct container services to/from Australia.

Equally long haul operators transiting such hub ports to/from Australia have the opportunity to compensate for any shortfall in their long haul cargo by picking up regional cargo – in turn generating increased volatility of demand for regional services such as Australia - SE Asia.

3.6.5 Fixed Day of the Week Services

It was mentioned in section 3.3 that since the major changes in employment conditions on the Australian waterfront arising from the Patrick dispute in 1998, berth availability at the major container terminals and cargo handling efficiency has improved dramatically – so that all the terminals are now achieving productivity normally in excess of 25 lifts per hour (the target adopted by the government of the day). As result in the intervening 6 years virtually every container service calling at Australia has effectively become fixed day of the week with specific berth windows allocated at each terminal.

This development has had major benefits for importers and exporters in efficient management of the international supply chain. However for carriers it has meant that the consequences of missing one's berth window are often a loss of priority and so serious delay, and there is heavy competition for prime time berth windows (loading exports late in the week and discharging imports early in the weekends for early subsequent week delivery). This situation is only sustainable with Australia's current port capacity and terminal utilization for rationalized consortia services, rather than a plethora of individual small ship operators, whose productivity alongside would be considerably lower – the larger the ship the higher the discharge/load rate – 1500 TEU ships struggle to achieve 40 ship lifts an hour with a crane intensity approaching 2. Larger 6,000 TEUs ships in major overseas ports can be handled at up to 100 lifts per ship hour and a crane intensity of 4 – 5.

3.6.6 China as the World's Manufacturing Centre

For the last 10 years China has achieved GDP growth of 8.9% p.a and an increase in industrial production of 13% p.a. (ABARE). It is rapidly emerging as the world's factory for a whole range of goods. This has major ramifications for the world economy, be it in terms of demand for and prices of raw materials and input goods, or in the volume of manufactures for export – as well as the pressures placed on and price of all the services supporting these dynamics. For example, between 1995 and 2003 China's output of TVs increased 3.5 times to 70m units, of air conditioners 7 times to 48m units and microcomputers from less than 1m to 30m units (ABARE). To support this growth its demand for steel more than doubled from 112m tons to 275m tons and for alumina from 5.8m to 11.7m tons between 2000 and 2004. The former was largely responsible for a doubling of world steel prices between early 2002 and mid 2004.

In this dynamic situation Australia is both winner and loser – exports to China (primarily bulk) rose in value from A$1.3b to $3b in the period 1997 to 2003. On the downside 12 month charter rates for dry bulk ships have risen from a low of around US$10,000 a day in early 2002 irrespective of size to $30,-$60,000 per day. And the demand for steel and the related price rises has led to a shortage of general cargo containers, for which PRC is the world's leading producer, and an escalation in cost from US$1400 to over US$2000 per unit in the last 9 months.

The recent ACCC examination of AADA southbound container freight pricing was critical of the headline rates reported to it by selected importers. However, it appeared to consider these increased freight rates in isolation, taking no account of the major upsurge in overall economic activity in PRC, which has

also in large part been responsible for the near fourfold surge in container ship charter rates since 2002 (refer section 3.5 above).

3.6.7 Maritime Security

In response to the events of 9/11 in overall terms and more particularly the terrorist attacks in the Middle East on the USS Cole and M/T Limburg, the International Maritime Organisation (IMO) introduce the International Ship and Port Security Code (ISPS) in December 2002, which became mandatory for all SOLAS signatory nations as of July 2004. This obliges all ship owners to undertake security risk assessments for their vessels, develop company and ship security plans and have a designated Ship Security Officer on each vessel.

Similar requirements are imposed on all ports and cargo terminals.

In addition every ship will possess a Ship Identity Number, have fitted Alert and Automatic Identification Systems, carry crew with standard international ID documentation, and report the last 10 ports of call at each new port of entry. In compliance with US Department of Homeland Security requirements, additionally details of all container shipments have to be submitted for clearance to US Customs 24 hours prior to loading at origin port – this applies to both destined and transit cargoes. Australia, in common with most IMO nations, is also progressively introducing scanning of containers (particularly inbound) at ports for security reasons.

The cost of implementing these new measures for ship operators has been estimated by the OECD to be of the order of US$1.3 billion in the first year and US$0.7 billion a year thereafter. A substantial part of this cost falls on container ship operators, particular those related to container information and scanning.

3.6.8 IT

In common with most other sectors of industry and commerce, IT applications in container shipping have intensified substantially beyond those primarily in use in the late 90s – largely related to terminal planning and ship stowage and maintenance. Today there is a very wide application of systems relating to cargo booking, documentation and tracking (particularly dangerous goods) that are part of a suite of global systems. Additionally container yield, logistics and maintenance management are the subject of sophisticated global IT systems required for the effective deployment of the estimated 18.8m TEUs of containers around the world – approximately 2.45 TEUs per container ship slot in operation.

3.6.9 Refrigerated Cargo

Advances in technology in refrigerated cargo carriage have been significant since 1999. Traditional reefer boxes controlled box temperature from chilled (+1C) through deep frozen (-20C). Current technology has generated applications of controlled atmosphere, whereby a combination (in some cases requiring variation during carriage) of gas injection/removal and temperature control can extend the shelf life of perishable products carried and widen the range of products that can stand sea transit times and arrive at end user in pristine condition. The economic implications of such developments for horticultural exporters are very significant as long as the ship operators can sustain the R&D costs to develop such services.

3.6.10 Summary

In summary, the container shipping industry over the last 5 years, both globally and to/from Australia, has been in dynamic mode, undergoing rapid growth, change and volatility in terms of markets, structure, hardware, systems and financial performance. The market has responded to demand signals, though with difficulty because of the tightness of the ship charter market. The supply situation should ease further as a surge in shipbuilding effects the major trades and frees up other ships for the Australian trades.

3.7 Summary of Key Australian Container Trades

The review in this section of Australia's key container trades (accounting for 86% of the total international box throughput of Australia's 5 main container ports) can be best summarized by highlighting the six key features as described in the following sub-section – the result is profiles of 6 very different container trades.

3.7.1 East Asia

- **Size –** Australia's largest container trade in total terms at slightly less than 1m TEUs in 2003/4 or 25% of the total.
- **Growth –** high, with full box growth nearly 12% compound p.a. since 1999
- **Balance –** 3 full Southbound (SB) boxes for every 1 Northbound (NB)
- **Operators & Organisation –** volatile with 10 different operating consortia or services, with substantial non conference participation (42% of operators)
- **Reefer** – importance growing for horticulture and dairy NB.

- **Freight Rates –** increases of actual rates 4 – 5% compound NB and 3-4 % southbound p.a. since 1999.
- **Other Factors –** imbalance NB is in part compensated by the fact the North Asian (Japan/Korea) services also dedicate space to the East Asian trade and has surplus boxes SB.

3.7.2 South East Asia

- **Size –** Australia's second largest container trade in total terms at nearly over 0.75m TEUs in 2003/4 or 19% of the total.
- **Growth –** moderate, with full box growth up 4.5% compound p.a. since 1999
- **Balance –** 3 full SB boxes for every 2 NB, a situation that has only developed since early 2003 (earlier it was in reasonable balance)
- **Operators & Organisation –** end to end trade reasonably stable with 3 national and 4 regional consortia or services, with substantial non conference participation (32% of operators)
- **Reefer** - important for NB horticulture and dairy products
- **Freight Rates –** in excess of 8% and 4% decline p.a. of export general cargo and reefer rates respectively; 9% increase p.a. of import rates, all in the last 2 years after 3 years of decline.
- **Other Factors –** the trade is significantly impacted by wayport operators in the European trade northbound and has substantial SB transshipment cargo from Europe.

3.7.3 Japan & Korea

- **Size –** Australia's third largest container trade in total terms at slightly less than 0.5m TEUs in 2003/4 or 13% of the total.
- **Growth –** low, with full box growth at 2.5% compound p.a. since 1999; this masks strong export growth (9.5%) and declining imports
- **Balance –** 1.75 full NB boxes for every 1 SB
- **Operators & Organisation –** reasonably stable with 3 different operating consortia or services, with substantial non conference participation (34% of operators)
- **Reefer** – critical NB reefer trade – currently Japan #1 export meat market, and important for dairy products

- **Freight Rates –** all rates in decline since 1999 until the surge in meat exports in 2004 reversed this trend for reefer exports.
- **Other Factors –** imbalance SB is in part compensated by the fact all the North Asian (Japan/Korea) services also dedicate space to the East Asian trade SB, where the imbalance is in the reverse direction.

3.7.4 Europe

- **Size –** Australia's fourth largest container trade in total terms at just over 0.46m TEUs p.a. in 2003/4 or 12% of the total.
- **Growth –** moderate, with SB imports relatively strong at nearly 7% p.a. and exports NB weak at 2.3% p.a.
- **Balance –** 3 full SB boxes for every 1 NB
- **Operators & Organisation –** 3 prime services operated by MSC and the RTW group with significant non conference participation (71% of operators when transshipment services are included)
- **Reefer** – important NB reefer trade for horticultural products
- **Freight Rates –** increase of actual dry cargo rates 8% compound, but in decline for reefer; little change southbound p.a. since 1999.
- **Other Factors –** imbalance NB is in part compensated by the fact there is wayport cargo to SE Asia on RTW Westbound services and the RTW Eastbound service also calls on the USEC. Heavy potential competition from transhipment operators over SE Asia, particularly SB.

3.7.5 New Zealand

- **Size –** Australia's 5th largest container trade in total terms at slightly less than 0.37m TEUs in 2003/4 or 10% of the total.
- **Growth –** moderate to high, with full box growth nearly 5% compound p.a. EB and 9% WB since 1999
- **Balance –** reasonably in balance
- **Operators & Organisation –** most services and operators part of the Forum Group, and relatively low non conference participation (38% of operators)
- **Reefer** – traffic in both directions, particularly westbound

- **Freight Rates –** all freight rates in decline since 1999 in both directions.
- **Other Factors –** end to end Tasman services are dovetailed with and in some cases in competition with wayport operators on the European, US and SE Asian trades. Forwarders and NVOCCs are major players in this trade.

3.7.6 North America

- **Size –** Australia's smallest key container trade in total terms at slightly less than 0.3m TEUs in 2003/4 or 7% of the total.
- **Growth –** relatively high NB until 2003 when the US$ weakened v. A$, and relatively weak SB until 2003 – again due to the change in the US:A$ exchange rate
- **Balance –** 2 full SB boxes for every 1 NB
- **Operators & Organisation –** highly structured to the USWC since the introduction of the VSA; effectively 2 operators to the USEC (RTW services & Maersk) – non-conference presence significant (38% of operators including transhipment).
- **Reefer** – critical for NB meat exports (traditionally #1 export market)
- **Freight Rates –** little change in effective rates to the USWC, with a slight increase in dry cargo exports and decline in the rest since 1999 – all more marked on the USEC.
- **Other Factors –** imbalance NB is in part compensated by the fact the USEC service is combined with the RTW European services; some T/S competition over Asia for USWC and South Africa for USEC. Forwarders and NVOCCs enjoy a major market

4 Economic assessment

This chapter, based in part on the previous one, assesses the economic characteristics of liner services to and from Australia and relates these to recent theoretical developments. Where possible there is focus on developments since the last Productivity Commission report in 1999.

4.1 Economic characteristics of liner shipping

4.1.1 Trade

The demand for shipping is a derived demand, depending on demand for products being shipped. Demand for products in turn depends on economic growth in Australia and its main trading partners, and geographical shifts in production - e.g. the rise in exports of manufactured goods from China to Australia and other countries. A consequence is that the price elasticity of demand for shipping services is low. Freight rates tend to move up and down with the business cycle, and to a greater extent than the economy.[4]

The period since the last Productivity Commission review has been one of strong economic growth in Australia and in many other countries that are significant to Australia. Trade has grown with GDP. Behind the trade-GDP relationship are forces moving in opposite directions: the increase in the service sector's share of GDP will have had a negative influence on shipping volumes as services are not physically traded, but the reduction in trade barriers will have had a positive influence.

Liner shipping volumes over the last few years, reported in the previous chapter, have been steady or rising depending on the trade, with the strongest growth being recorded in southbound trade to Australia from Southeast Asia and Northeast Asia (notably China). Changes in technology, comparative advantage and trade policy means that many manufactured goods consumed in Australia are now imported from that region.

There has also been an increased degree of imbalance between southbound and northbound trades on these routes -- Australia's exports by liner ships (in volume, ie TEU, terms) have been relatively steady but its imports have grown

[4] Mary R Brooks, *Sea Change in Liner Shipping*, p209.

strongly. The imbalance has an impact on shipping costs because of the need to operate with empty slots or empty containers in one direction. This effect is aggravated by a tendency to use 40 ft containers for southbound manufactured products, many of which have low density (low weight relative to volume), and 20 ft containers for northbound Australian exports which are often more dense (e.g. agricultural products).

World economic conditions have also had an indirect effect on some of the services to Australia. At times of low demand in the major East West trades, shipping companies seek to feed Australian traffic through Singapore and other Asian hubs, affecting the service balance as discussed in chapter 3..

The information in the previous chapter showed that Australia's main liner trades have many shipping companies or consortia, no one of which is dominant. Some of these are in discussion agreements and some are independent. The shipping companies and consortia have a range of nationalities, sizes (outright and in terms of network) and types of ownership (family companies, listed public companies, government owned companies etc). In addition a number of them sell container slots on a wholesale basis to other companies that are not ship providers in the trade in question. The ship providers often have little or no influence over these slot purchasers' marketing and retail pricing. 19 of the world's top 25 container shipping companies, representing 80% of global container ship capacity, are present on Australian trades, primarily with ships and in a few cases through slot charters.

Box 1 **Definition of types of shipping company coordination**

The definitions used in this paper are those used in Part X of the Trade Practices Act. The Act refers to conferences, which traditionally are associations of shipping companies that seek to rationalise schedules and capacity, and set common prices. However the act uses the term more broadly to also cover consortia, alliances, slot charters and discussion agreements (see Productivity Commission 1999 page xxv).

Our understanding is that coordination on Australia's main liner routes is now essentially of the discussion agreement type, providing for discussion but not binding agreement on schedules, port coverage, prices and capacity. Discussion agreements, at least on Australia's trades nowadays, do not control anything (eg capacity or prices) and do not have means of enforcement. These agreements discuss price adjustments (eg percentage changes, surcharges minimum rates), but not market rates for individual shippers (which are at many different levels, and often not known outside the parties directly involved). Discussion agreements apparently do not usually discuss individual customers. They act as information exchange forums on overall current and future demand.

The US Federal Maritime Commission considers that discussion agreements "make it possible for carriers to establish broad networks with more service routes and faster transit times, a very pro-shipper outcome" (Hsu 1998, quoted in Mary R Brooks p 256).

Barriers to entry and exit for Australian trades are low, at least for companies already in the shipping business somewhere[5] (the usual case), because:

- many ships are chartered, and there is a liquid (though currently tight) charter market
- container ships have become increasingly standardised
- the asset is mobile
- ports are multi-user
- shipping interests generally do not control ports
- liner services (unlike some bulk services) generally do not suffer from congestion.

The main entry cost -- and potential sunk cost if the enterprise fails -- is the establishment of market relationships. In addition, new entrants have to be substantial enough to place enough ships on a trade to provide at least a weekly service. This requires a minimum of four ships on the Australia Southeast Asia trade, five on the Australia and Northeast Asia trade, seven on the Australia North American trade and at least ten [on the Australia to Europe trade. The ease of entry and exit is confirmed by experience in the Asia Australia Discussion Agreement which, five years ago, consisted of nine consortia/operators only one of which is there now in the same configuration.

The low barriers mean that liner shipping is contestable (though not perfectly so) -- i.e. the threat of new entry, even if not put into practice, is sufficient to discipline incumbents' behaviour.

The low barriers, and the international competition already present within the trades, also force liner shipping companies to be technically efficient. The generally low profits[6] liner shipping means that efficiency is important for long run survival.

4.1.2 Scheduling and service

Australian maritime routes are, by Northern Hemisphere standards, "thin". However there is enough trade on the main routes to provide the basis for regular services and shippers -- especially since the reform of container terminal operations in the late 1990s which removed a frequent source of delay -- expect a weekly timetable of reliable services, examples of which were given

[5] "…[barriers to entry] can be relatively low for a well-known established carrier entering an additional market (new route)." Mary R Brooks p213, using a Canada – Europe example.

[6] This was the case at the time of the previous Productivity Commission review (1999 PC Inquiry Report p xxvi, is confirmed by Mary R Brooks (2003) and by Thompson Clarke's shipping industry contacts.

in the previous chapter. Shipping companies endeavour to provide a spread of regular services meeting shipper preferences (eg fewer departures on Tuesdays and Wednesdays than later in the week) within the constraints of port and stevedore capacity, overseas berthing windows, circular runs etc.

Frequent and predictable services are important to importers and exporters who seek to meet customer order deadlines while minimising inventory (e.g. just-in-time arrangements). Frequency, regularity and predictability are the main quality dimensions of liner shipping services. Containerisation has commodified the services as the content of each box is generally no longer relevant for pricing purposes (except for reefer containers), though knowledge of each box's weight remains important for safe loading and commodity details are now essential for security reasons.

All the ships on trades to and from Australia are of a certain minimum quality because of the safety requirements set and enforced by the Australian Maritime Safety Authority (AMSA). The enforcement of the International Maritime Organisation's ISPS Code as of July 2004 (refer Section 3.6.7 above) has imposed further significant requirements on ship operators as well as ports and terminals.

Subject to adequate frequency, there is an advantage in moving to bigger ships because of economies of scale (a 10 per cent increase in ship size in terms of slot capacity typically translates to a 3 to 4 per cent reduction in cost per container).[7] Competition provides pressure for cost savings to be passed on to customers.

Coordination of services between shipping companies, and slot charters/swapping among them, allows the best trade-off between frequency and ship size. It also allows greater exploitation of economies of scope (e.g. services to separate submarkets such as different ports) and network economies (e.g. consolidation of freight through transhipment and hubs – sometimes with reduced overall transit times because bigger faster ships can be used).

As the Productivity Commission said in its 1999 review

> The supply of regular, scheduled liner services provides a means of reducing transactions costs so that shippers with diverse demands are able to access (and afford) adequate liner shipping services. Liner shipping is characterised by a range of economies of scale and scope which suggest that low-cost supply of coordinated services is likely to require some form of industry integration. (page 35).
>
> The provision of a regular "bus service" is a way of accommodating shippers' diverse demands for frequency, reliability etc while allowing various production economies to

[7] Meyrick 1999.

> be captured by carriers. However a single shipping line may be left to commit several vessels… in order to provide a regular scheduled service where demand is uncertain… In order to reduce this risk, the operator may commit smaller vessels…[which] mean higher costs… Co-operation with potential rivals offers an alternative way of reducing demand uncertainty… larger ships can be utilised… (page B7).

The market definition used when considering competition policy aspects should, as usual, be based on substitutability. Generally any one market should be point to point in one direction (eg Melbourne to Shanghai) with care taken to allow for local transport changes (eg Melbourne tending to become a port for Adelaide) and fast transhipment times (service over Singapore sometimes being quicker than direct services, depending on the ships used and the specific port pairs involved).

4.1.3 Prices

As shown in the previous chapter, the trend in average shipping freight rates since the last Productivity Commission review has been steady or downwards except where there has been a large increase in demand (to Australia from Asia). Experience in liner shipping is that demand fluctuates more than supply; this is managed by operating with spare capacity at times.

Some importers and the ACCC have drawn attention to apparently coordinated headline prices which increased substantially over a short period[8]. However in practice these are similar to the official rates quoted by airlines and rack rates quoted by hotels -- the norm is to discount from them:

- we understand that 80 to 90% of freight on Australia's main liner trades is on periodic contracts, typically at less than the publicly quoted rate, and of one year duration
- the actual price paid is usually different from the headline rate -- this is confirmed by average price statistics moving less than the headline rate
- there is competition among shipping companies and consortia within discussion agreements, between those members and independents, and from the 14 companies serving New Zealand, many of which include Australia on their circuits
- there is countervailing pressure from freight forwarders and shipper groups
- conferences/discussion agreements applicable to Australia have no powers of enforcement over the freight rates charged by their members, although

[8] Mary R Brooks (p211) reports a similar development in the Asia – US run when demand was high in 1998.

in US trades the US Federal Maritime Commission (FMC) levies heavy fines on parties (carriers and cargo) who may breach filed contracts or rates

- the commodifying effect of containers has increased competition by removing a possibility for discrimination. Separate rates for different types of freight have generally been replaced by General Cargo rates
- surcharges (eg to cover fuel price increases) tend to stick, but as a percentage on a myriad of base rates which are usually known only by the particular shipping company and shipper. Bigger shippers can negotiate all-in rates, so surcharges blurr into an overall supply/demand result over time but there are transparency advantages in keeping such surcharges separate from the freight rate and making them public..

4.1.4 Investment and capacity

Liner trades to and from Australia are increasingly operated by chartered ships of 2500 – 4000 TEU capacity, some cascaded down from busier Northern Hemisphere East-West trades where much larger ships are being introduced (the impact of cascading is expected to increase as from next year). Traditional 1700 TEU ships are thus being replaced by ships with better economies of scale. For larger ships, fixed costs account for a larger percentage of total costs, and variable costs a smaller percentage of total costs, compared with smaller ships; overall unit costs (per TEU) are lower on the larger ships.

Increased demand will normally bring forth increased capacity unless there is collusion to prevent it. There has been evidence of such increased capacity: on the Northeast Asia-Australia route where southbound demand has increased substantially., Twelve new ships in three new services have been added in Q2 2004 which will provide a 25% increase in capacity[9]. This increase is inconsistent with the collusion hypothesis. However it has occurred with a lag of one to two years, because:

- low overall profitability in liner shipping has made investors cautious -- e.g. waiting to see that the demand increase is not just transitory
- the overall economics of the route are not as favourable as the southbound statistics suggest because there has been no increase in northbound trade
- five extra ships are needed to provide a weekly service on this run.

4.1.5 Risk management

The Productivity Commission Issues Paper for this inquiry raises the question of whether the development of more sophisticated financial instruments allows

[9] ACCC Position Paper, April 2004, page xv. In addition 2 of the previous consortia have changed shape and introduced replacement services, making 5 new services in all.

discussion agreements to be supplanted as a means of managing risks in liner shipping.

The risks inherent in liner shipping are to costs (eg changing fuel prices and ship charter rates) and revenues (eg the business cycle and the impact of new competitors who may enter a discussion agreement or operate outside it). Foreign exchange risks affect both cost and revenues.

A conclusion from the above discussion is that discussion agreements have little impact on these risks, and fulfil roles other than risk management.

It is not clear that new financial instruments provide more than a peripheral means of reducing risks in liner shipping. An aspect of shipping costs which might appear suitable for risk hedging is bunker fuel, but we understand that no such market has developed. Similarly a market has not developed in relation to ship charter rates; the necessary counterparties have not emerged, possibly because of multiple factors at play (business cycles in different markets, trade imbalances, spare capacity at times, delayed cascading effect of larger ships on northern hemisphere runs, order-delivery lag in shipbuilding).

4.1.6 Overall assessment

The evidence of the basic characteristics of this industry and of its performance over recent years is not consistent with a view that market power is being exercised. In particular the price increases reported during the ACCC investigation do not appear to be an accurate indicator of the broader picture. Instead it appears that market is working efficiently -- increased demand has put pressure on prices which gave the signal for investment in increased capacity, and competition within and outside discussion agreements appears to be disciplining actual (as opposed to headline) prices and ensuring efficiency.

We now discuss recent theoretical developments. They are consistent with these observations.

4.2 Economic theory

4.2.1 Introduction

Drawing from the above discussion, the economic characteristics of liner shipping may be listed as follows:

- economies of scale in ship size, fleet size and ports. Capital intensive – over 80% of costs can be fixed.[10]
- economies of scope

[10] Mary R Brooks p 197.

- economies of service coordination – shippers can switch carriers for less than $25 per Container
- low price elasticity of demand
- low switching costs
- limited scope to vary capacity in the short run because of the need for weekly schedules; lumpy investment to increase capacity (several ships minimum)
- modest profits.

The previous Productivity Commission report provided a sound summary of the economics of this industry (which are essentially unchanged now), especially in Appendix B. In short:

- liner shipping does not satisfy the conditions of perfect competition because of indivisibilities and economies of scale and scope
- its performance is not consistent with oligopoly or cartel theory because of low barriers to entry, modest profits and cost-related prices [11]
- there are (as discussed above) relevant insights from contestability theory – low barriers to entry mean that the threat of entry disciplines incumbents' conduct
- there were early indications, since confirmed, that game theory (ie theories of strategy) - in particular the theory of the empty core - would provide insights. It is in this latter field that there has been significant development since the 1999 Productivity Commission report.

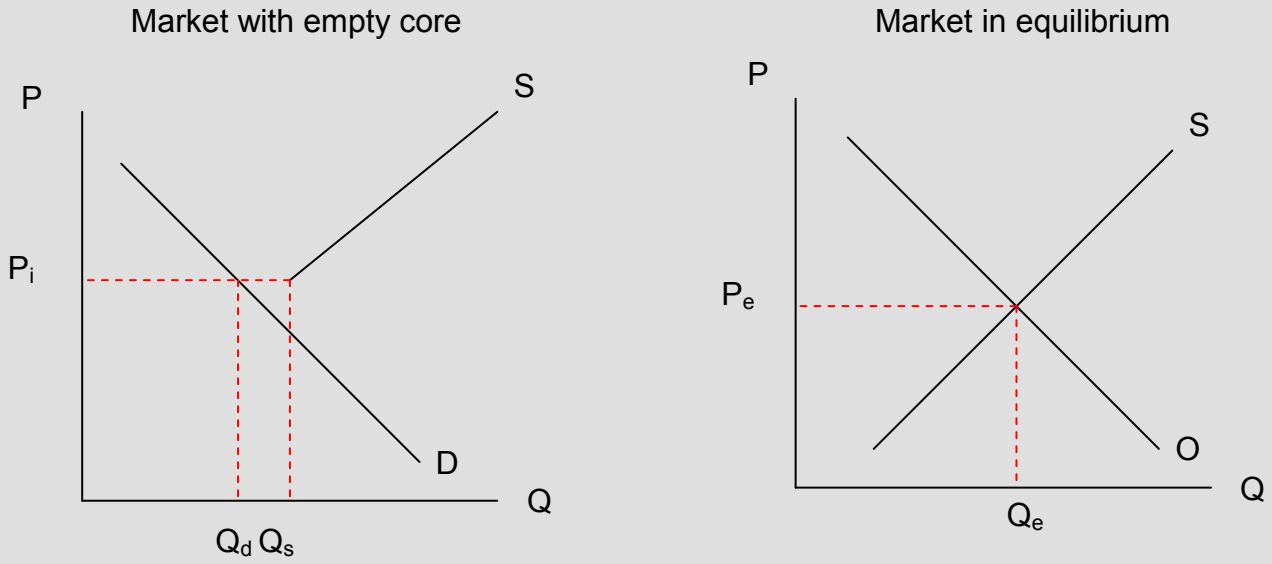
4.2.2 Theory of the core

This theory, summarised in the box, is not the only possible explanation for what is observed in liner shipping (the customer-driven need to coordinate schedules is itself an important factor). However the theory is consistent with what is observed; it does not prove what the forces at play are, but is valuable for its insights.

[11] As the Productivity Commission said in 1999 (page 35, "… the fact that conferences are common in liner shipping and that they have persisted for over a century despite massive market expansion and technological change (especially containerisation) and the absence of significant barriers to entry suggests that they are not just monopoly cartels. Indeed in the absence of regular barriers to entry, any entry restrictions must derive from the incumbency advantage of conferences themselves. In other words, any market power of conferences must arrive from the cost savings they generate…"

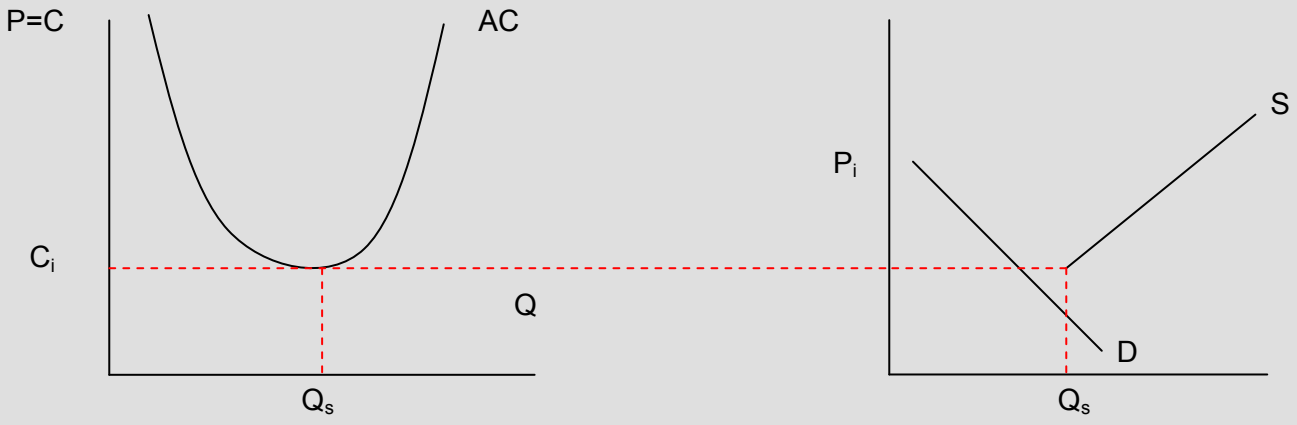
Box 2 **Empty Core Theory**

The theory of an empty core has been used to explain the lack of equilibrium in a market. That is, supply and demand conditions are such that the price at which consumers are demanding the product is not high enough for the producers to supply a single unit of the product. The supply and demand curves do not intersect. As shown in the graph below.



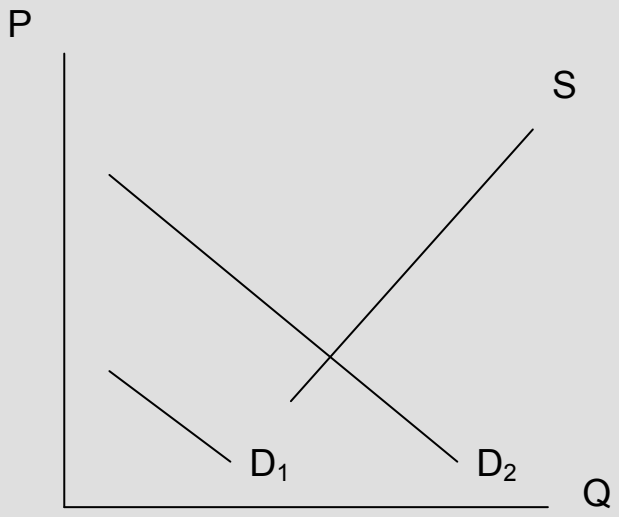
As can be seen in Figure 1, the supply and demand curves in the market with an empty core do not intersect. The producer will only start supplying at price = Pi and the minimum quantity supplied is equal to Qs. However, at this price (Pi) consumers only demand Qd. Thus there is excess capacity and the market cannot achieve equilibrium,

When producers are faced with avoidable fixed costs and rising marginal costs, they have a U-shaped average cost curve and no output will be produced at any price below the minimum average cost. (See graph below) Producers who face a downward sloping average cost curve have high costs for producing one unit of their product due to the fixed cost of starting up. The average cost declines as additional units are produced as the fixed costs can be spread over the additional units. (See graph below)



In an industry that has a U-shaped average cost curve, the producer only faces lower average costs of producing more units up until a certain point and then fixed costs become variable and must increase. That is, the first ship has reached capacity and another ship must be deployed.

If demand was to increase for reasons other than a change in price, the demand curve would shift outwards (e.g. an increase in exports), and the market would achieve an equilibrium, as shown in graph below.



Thus the empty core is more likely to occur when the demand for a product is low or variable.

Source for this box: Sjostrom (2002), who illustrates the theory with a taxi example from George Bittlingmayer. An empty core is found when demand is low.

As the Productivity Commission noted in 1999 (page B6), the theory of the core "suggests that industries [such as liner shipping] characterised by uncertain and or periodic demand, large plant capacity is relevant to demand, increasing returns to scale, fixed plant capacity, avoidable fixed costs and costly or zero storage, may have no stable competitive [price] equilibrium."

The Erasmus report commissioned by the European Commission in 2003 (listed under Haralambides in the bibliography to this paper) provides, in its appendix on theoretical issues, a more thorough application of empty core theory than was available to the Commission last time. Among its conclusions (subject to a range of caveats) are:

- there is a risk that in the absence of a method of imposing equilibrium in the market, liner companies will be too small and have costs that are unnecessarily high. With falling average costs, competition will produce too little capacity
- to ensure that there is an efficiently large amount of capacity (an economic sense) the industry must operate with excess capacity that would be unprofitable under perfect competition
- restrictions on competition, in the form of shipping conferences, are a low-cost way to ensure that the liner market is sustainable. The low costs are

shown in the low profitability of the industry, and the fact that there is no need for an independent regulatory body to control services and rates. In other words, conferences may look like, but do not act as if they are a price fixing cartel.

A subsequent appendix to the Erasmus report, on freight rate stability, draws a number of statistical conclusions (some stronger than others) which are consistent with the theory, including:

- increases in industry concentration lead to reductions in prices rather than the expected increase… the conference simply becomes an information source for individual members to gauge their efforts to undercut associates in pursuit of market share
- the impact of market concentration on freight rate instability may be to decrease it
- the US decision to allow carriers to engage in long-term and confidential contracts with shippers (as allowed on Australian routes) reduced average freight rates and increased their volatility
- conferences have little market power and, compared with a cartel, may actually heighten competition among both members and independent operators
- it is likely that the liner conference rate acts more as a benchmark that serves as a starting point for negotiations of service contracts… it is questionable whether this benchmark has any direct effect on the final price.

Although still a "work in progress" area, this early work is generally consistent with the more direct economic results discussed earlier in this chapter. Together, they suggest that there would be substantial risks in prohibiting coordination between liner shipping companies.

5 Future policies

As discussed in the previous Productivity Commission report, if Part X were abandoned the most likely alternative is Part VII (ad hoc ex ante ACCC approval of shipping company cooperation, trade by trade, for limited-duration periods, subject to normal regulatory processes). Thus removal of Part X would have the effect of introducing economic regulation to this industry.

In Australia basic principles of regulatory policy are that the objectives are sound and clear, the proposed regulation achieves the objectives, the costs of the regulation are less than the benefits, and there is not a better alternative. In other words, the onus of proof is on those who would expand economic regulation.

In our view these principles do not appear to be satisfied by proposals to increase the economic regulation of liner shipping. The objective of competitive liner shipping, with the quality dimensions sought by its customers (reliability and regular frequency), is already being achieved. It is not clear that the regulatory alternative would achieve this – it could deter some shipping companies by making the Australian trades less attractive than some others, by imposing new transaction costs and new uncertainties. In other words the costs could exceed the benefits (the costs would be higher than now, and the benefits could be negative). Thus it is not clear that the alternative of economic regulation is better than continuing with no economic regulation, and it is plausible that it would be worse.

There are also some practical considerations:

- The trades in greatest contention recently, southbound from North and Southeast Asia, generally have their rates set in Asia as do most inward trades, outside the jurisdiction of the Australian authorities.
- If Part X no longer applied and shipping companies could not cooperate as present, they could be encouraged to internalise the cooperation through mergers – which again would be outside the jurisdiction of Australian authorities.

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