BENCHMARKING AND REFORM IN THE AUSTRALIAN MARITIME SECTOR

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ABSTRACT

This paper illustrates the role of international benchmarking in the process of microeconomic reform in Australia. After discussing the process of international benchmarking and the role of external monitoring agencies, the paper summarises findings published in the Bureau of Industry Economics' International Benchmarking - Waterfront 1995 report published in August 1995. It compares the performance of Australian and overseas container, break bulk and coal ports. The performance indicators reported cover waterfront changes, the timeliness and reliability of services and productivity. The analysis draws on 1995 data for price comparisons and 1994 data for timeliness and productivity comparisons. The results show that the productivity gains achieved during the WIRA process need to be consistently maintained over long periods before they can be expected to be reflected in revised ship schedules and further reductions in freight rates. It will be difficult for Australia to develop a reputation as a reliable supplier of elaborately transformed manufactures if the timeliness and reliability deficiencies of container and break bulk operations are not urgently addressed.

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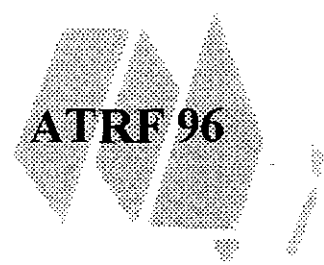


Benchmarking and reform in the Australian maritime sector

1. Introduction

Over the past decade governments in Australia and overseas have embarked on microeconomic reform programs aimed at lifting the performance of their economies. A common feature of these programs has been the concerted efforts to improve the performance of infrastructure service industries.

A major reason for the focus on infrastructure industries in reform programs is the important role government has traditionally played in their ownership and regulation. Moreover, there has been a widespread perception that infrastructure industries have under performed.

The introduction of increased competitive pressures in infrastructure industries, through deregulation, corporatisation and sometimes privatisation, has been a key element of many microeconomic reform programs. Changes in technology and in the corporate culture within infrastructure industries have also been instrumental in raising their performance. While governments have relied upon market forces to lift the performance of infrastructure industries, they have also kept a keen interest in their performance. Continued government ownership and regulation of infrastructure industries remains important where significant levels of monopoly power exist.

It is within this context that performance monitoring of infrastructure industries has been introduced. The broad objectives of performance monitoring are to:

- provide information to allow government to fine tune and identify priorities within their microeconomic reform programs;
- enable governments to monitor the activities of those trading enterprises in which they possess a major share holding;
- ensure that the benefits of reform are passed on to users; and
- introduce competitive pressures indirectly through performance targets or 'yardsticks' in those industries where competitive forces are weak.

In the Prime Minister's statement of 12 March 1991, *Building a Competitive Australia*, the Bureau of Industry Economics (BIE) was directed to identify the contribution of infrastructure services to industry costs, develop relevant performance measures, and to publish these on a regular basis. In the 1994 *Working Nation* White Paper the project was extended for another 4 years and broadened to encompass

government services. However, the incoming government has recently disbanded the BIE and its benchmarking teams.

The international benchmarking project was an explicit recognition by the Commonwealth that the competitiveness of Australian enterprises in international markets is determined, in part, by the costs of infrastructure inputs and services. These infrastructure services are provided by enterprises that may not themselves be exposed to international competition. In the case of some infrastructure services they may not even be exposed to competition in the domestic market. This may be due to either the nature of the industry itself or as a result of regulatory and institutional barriers to competition.

A focus on international performance indicators for the various infrastructure service industries raised the awareness of both relative performance and, importantly, of the key drivers of performance in that industry. In this way performance monitoring identified whether reform in Australia was keeping pace with improvements overseas. It also identified priority areas for future reform initiatives.

2. Performance indicators used by the BIE

The performance measures developed for the international benchmarking project fell into two broad categories:

- price and timeliness indicators; and
- productivity indicators.

The price and timeliness indicators compare the performance of Australia's infrastructure services against that of our international competitors from the perspective of business users. In particular, they show whether Australia's traded goods sector is disadvantaged by the performance of domestic infrastructure industries. The international comparisons developed for this part of the study focus on indicators such as port and terminal charges and ship turnaround times. The results show Australia's competitive position in relation to other countries.

While the price and timeliness indicators are useful in identifying the impact of infrastructure services on users, they do not explain the cause of differences. For instance, some of the performance gaps will be due to the nature of providing infrastructure services in the Australian environment and may not be easily amenable to remedial action by management or government (eg availability of natural harbours and trade volumes).

Some of the differences in the price and timeliness indicators, however, can be influenced by government and management action (eg dividend policy, work practices and capital investment). Comparisons of productivity indicators attempt to indicate the

extent of potential efficiency improvements. The key questions are how do we rate against world best practice and to what extent can we improve our performance?

The selection of performance indicators and the identification of world best practice are difficult tasks. The process followed by the BIE was to involve infrastructure service suppliers and industrial consumers in the selection of the performance indicators and the determination of appropriate international comparisons. The intention was to develop credible and relevant measures which both suppliers and users could use to assess performance changes. The selection was consistent with the guidelines for effective performance monitoring identified by Hilmer (1991). According to Hilmer measures should:

- deal with relatively few factors;
- highlight tangible factors;
- encourage improved performance; and
- relate to credible goals.

In other words, a few outputs and inputs are critical and the aim is to focus on the key drivers of performance.

There are four key stages in the benchmarking process when this is being undertaken by an individual enterprise. Firstly, a thorough understanding of the organisation's strengths and weaknesses must be achieved. Benchmarking can act to identify the factors that are critical to the success of a firm. By understanding the firm's strengths and weaknesses, a firm can begin to plan ways to improve performance. Many GBEs find simply the identification of what they really need to do well to improve performance beneficial.

The second stage is to determine which other firms, either nationally or internationally, are particularly adept at performing specific functions. These firms should then be included as benchmarking partners. It is unlikely that an individual firm will be best at performing all functions. It is important to aim at international best practice for each key process. This may lead to looking at firms outside the industry, if the function is easily transferable.

The third stage, after identifying world leaders in particular processes, is to make contact with these firms, learn whatever can be learnt from their operations and adapting their practices wherever possible. Typically, this will involve visiting the benchmarking partners and establishing an information exchange program.

The final important stage of the benchmarking process is an on-going pursuit of best practice. A firm should always be striving to improve performance. Resting on one's laurels is a recipe for disaster in a competitive environment.

When a government agency is charged with benchmarking an industry from outside the focus is on the first and second stages of the process outlined above. The external

monitor can obtain information on the enterprise's own performance and identify which firms world-wide are achieving international best practice. This provides important information both for the policy debate and to the industry. It is then largely up to individual enterprises to take up the process and carry out the third and fourth stages which require a detailed understanding of the operation of industry processes and the entrenchment of a 'continuous improvement' culture within the enterprise. However, external monitoring agencies can also play a useful role here by working jointly with industry associations and leading firms on practical ways to improve performance. This can then have a powerful demonstration effect on other firms in the industry.

This paper compares the performance of Australian and overseas container, break bulk and coal ports. The performance indicators reported cover waterfront charges, the timeliness of services and productivity. The analysis draws on 1995 data for price comparisons and 1994 data for timeliness and productivity comparisons. The paper summarises findings published in *International Benchmarking — Waterfront 1995* (BIE 1995), published in August 1995. The BIE report drew heavily on the results of a consultancy carried out by Symonds Travers Morgan (STM 1995).

3. The waterfront reform process

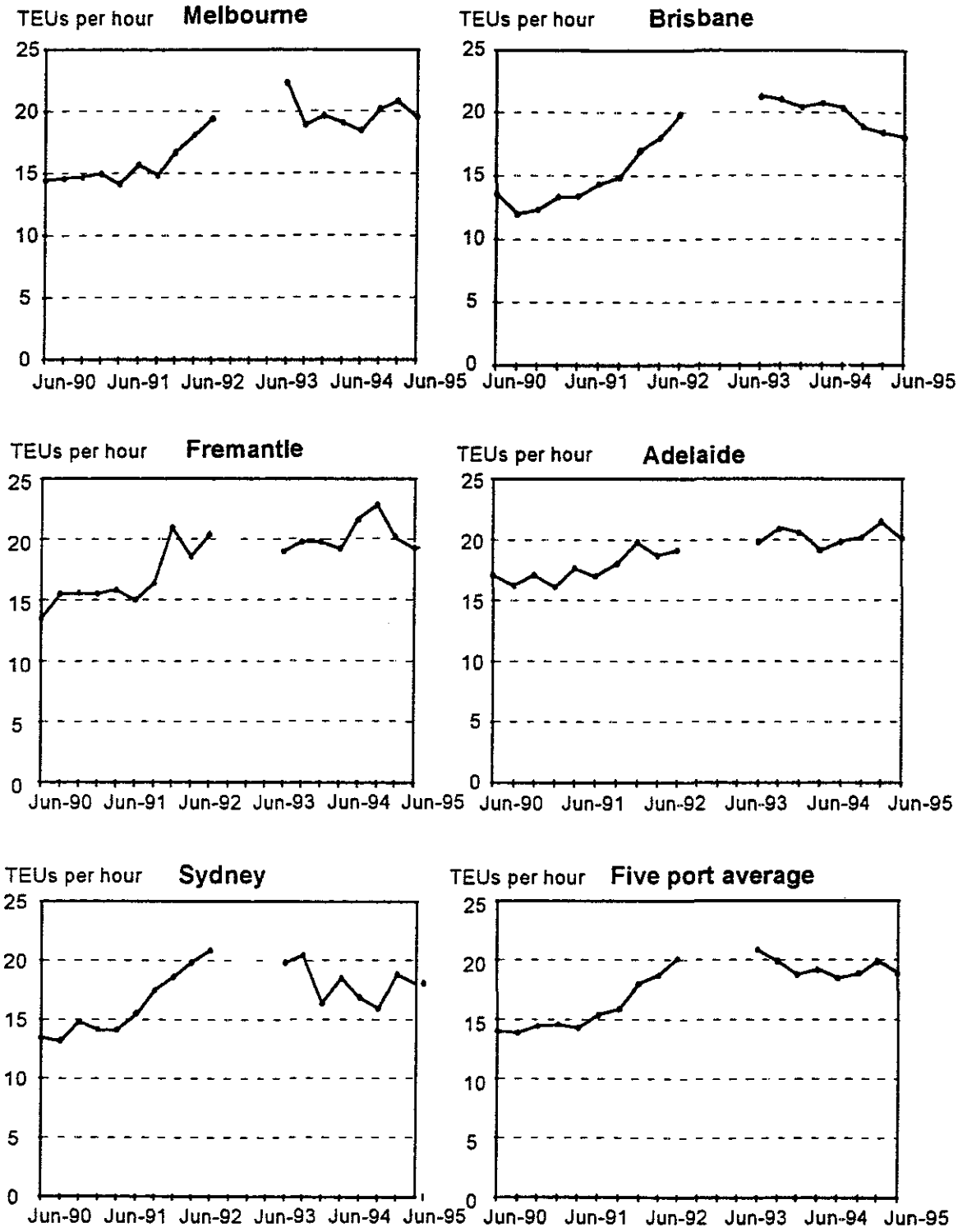
Waterfront reform has been a high priority for Commonwealth and State governments over the past decade. These reforms have comprised two distinct elements:

- labour market reforms, which seek to reduce costs and improve terminal productivity; and
- commercialisation and corporatisation, which seek to raise the performance of government owned port authorities.

The reform process has involved participants from government, port authorities, unions, terminal operators, ship owners and shippers. It has not been easy.

The reform has had some success. Port authorities have become profitable and their charges have fallen. Productivity in the terminals, particularly the container terminals, increased during the Waterfront Industry Reform Authority (WIRA) reform process of 1989 to 1992. This productivity improvement was subsequently reflected in reduced terminal charges. But the reform process has been costly — $420 million for the WIRA process alone. Moreover, productivity in the Australian container terminals either stagnated or went backwards in 1994 (figure 1), raising questions about the sustainability of the WIRA improvements.

Figure 1 Crane rates by major Australian ports, June 1990 to June 1995



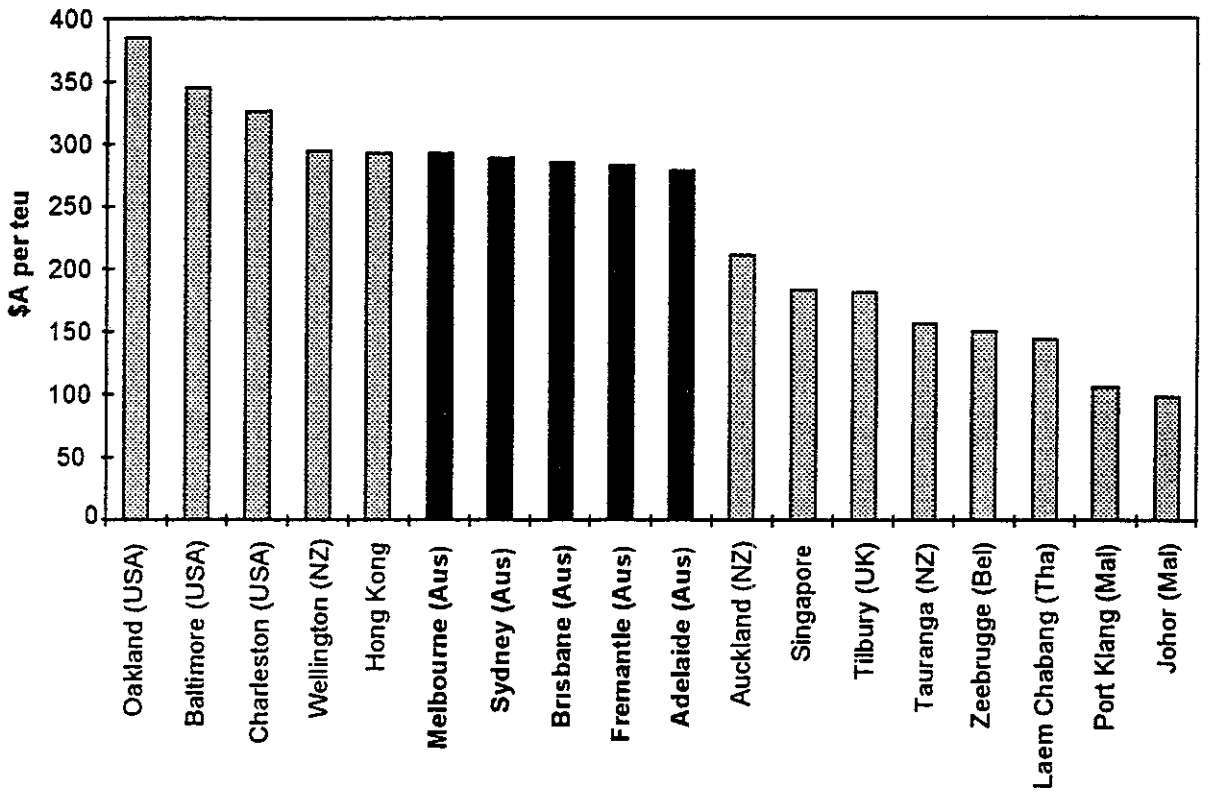
Notes: (a) Net rates measure the number of teus moved per net hour (the time the ship is at berth less time due to shift breaks or unforseen circumstances — eg bad weather and industrial disputes Crane rate is the number of teus moved per crane per net hour. Neither the WIRA nor the BTCE monitored terminal performance between December 1992 and June 1993 hence the break in the series
(b) Average of Melbourne, Sydney, Brisbane, Fremantle and Adelaide.

Source: BIE 1995

4. Containers

Waterfront charges for containers in Australia are considerably higher than most ports in New Zealand, Asia and Europe (figure 2). On the positive side, Australia's container charges are on a par with the port of Hong Kong and lower than some of the more expensive North American ports. Accounting for around two thirds of waterfront charges, *terminal charges* are the main reason for Australia's high waterfront charges. However, these high terminal charges are often compounded by relatively high port authority, tug and pilot charges.

Figure 2 Waterfront charges[a] by container port, 1995



Notes: (a) Includes pilotage, towage, mooring, navigation, berthage, wharfage and stevedoring charges for a 17000 grt vessel with a container exchange averaged over 200, 400, 600, 800 and 1000 teus
Source: BIE 1995

It is often argued that Australia's relatively high waterfront charges are due to a combination of the provision of subsidies to ports overseas and the requirement that Australian ports pay taxes and dividends. While removing these requirements might reduce port authority charges, it would not significantly alter Australia's overall ranking. This is because port authority charges account for only one quarter of waterfront charges. Moreover, charges at other ports overseas (eg Auckland and Tilbury) would also fall if tax and dividend requirements were removed.

Timeliness and reliability are important for the container trade where the goods shipped tend to be high value and time sensitive. They are also important for liner shipping companies which operate according to fixed schedules. Poor timeliness and reliability on the waterfront effects users in two ways:

- scheduled delays - poor timeliness reduces the number of ports a vessel can visit on a regular voyage and adds directly to port costs incurred through additional time related charges; and
- unscheduled delays - poor reliability means that shippers have reduced ability to take advantage of Just-in-Time inventory techniques and are placed at a competitive disadvantage in export markets. In addition, if delays are lengthy, ship operators may be required not to visit one or more subsequent ports in order to maintain voyage schedules.

To present comparisons of reliability, the BIE drew on P&O Containers' internal benchmarking work conducted in 1994 for its Mediterranean and Eastabout services that visit ports in Europe, Australia and New Zealand. When interpreting the results of this case study it must be recognised it reflects the experience of one ship operator in 1994.

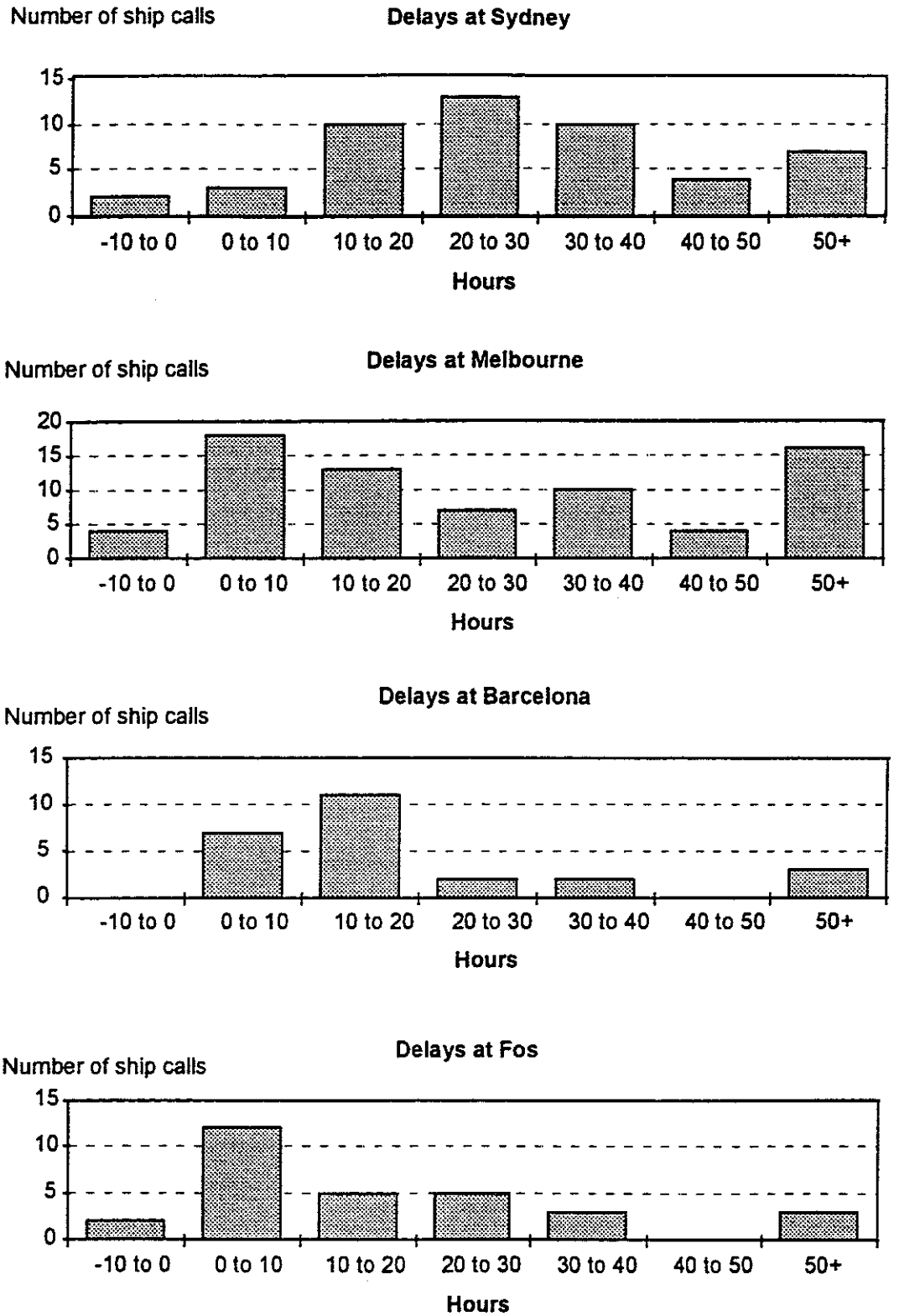
As liner shippers, P&O are under pressure to conform to a schedule and therefore view consistency as the most important attribute of terminal operators' performance. In managing their voyage schedules P&O negotiates 'expected' production rates (containers handled per hour spent in port) with the relevant terminal operators. In determining these expected production rates P&O takes into account things such as container volumes, ship rates and environmental conditions. Allowances are also made for smaller ports, the state of equipment and crane intensities.

With the exception of Barcelona, the gap between planned and actual production rates was larger for the Australian ports than for the overseas ports included. For example, in 1994 Sydney was the least reliable Australian port, handling less than half the expected teus per hour in port. However, it is the distribution of the delays which can have a profound effect on liner shipping activities. For instance, while delays of up to 10 hours can be made-up during a voyage this is generally not the case for 2 day delays which are likely to result in the by-passing of subsequent ports.

In the case of Sydney and Melbourne, the high average delays were due to a large proportion of P&O vessels being subject to lengthy delays at these ports. At Sydney the most common delay, experienced by 25 per cent of P&O's ships, was around 1 day (20 to 30 hours). At Melbourne, the most common delay, experienced by 45 per cent of ships, was lower and was under 20 hours (figure 3).

Despite this however, Melbourne could be considered a more unreliable port. For instance, 30 per cent of P&O's vessels at Melbourne, as against 20 per cent at Sydney, experienced the lengthy delays (over 40 hours) which can be costly for liner operators

Figure 3 Delays at selected container terminals, 1994



Source: P&O Containers Pty Ltd

P&O's experience at the overseas ports is in some contrast to its Australian experience. Similar to Melbourne and Sydney, P&O's vessels experienced high average delays at Barcelona and Fos (15 to 25 hours). Like Melbourne, the majority of these delays are under 20 hours which have relatively little impact on its schedules. However, in contrast to the Australian ports only 10 per cent of P&O's vessels at Barcelona and Fos experienced delays in excess of 40 hours which may have serious implications for ship schedules.

The greatest concern with Australia's performance must lie with stevedoring productivity where crane rates (container moves per hour per crane) declined during 1994, and fell back to 1991-92 levels. The improvement in the five-port average in the March quarter of 1995 was reversed in the June quarter with set-backs occurring at Melbourne, Sydney, Brisbane, Adelaide and Fremantle (figure 1). This decline, combined with continued improvements in many ports overseas, means that Australian crane rates are no longer on a par with similarly sized ports overseas (BIE 1993).

Crane rates at the best performing Australian container terminal (18.5 moves per hour at Fremantle) are equivalent to some of the poorest performances in Europe (eg 17 moves per hour at Trieste) (figure 4). More often, however, Australian crane rates are 25 to 50 per cent below the better performing ports (eg 30 moves per hour at Laem Chabang in Thailand and 29 at Oakland in the United States).

As would be expected, the gap between the Australian ports and the major hub ports in Europe and Asia is even larger. For instance, the ECT Delta terminal in Rotterdam, the Sealand terminal in Hong Kong and TP&K terminal in Singapore all achieved crane rates of around 50 teus per hour. When measured on a per box basis, the crane rates at these terminals fell to around 30 *moves* per hour which is equivalent to the rates achieved at the smaller ports of Laem Chabang, Antwerp, Oakland and Zeebrugge.

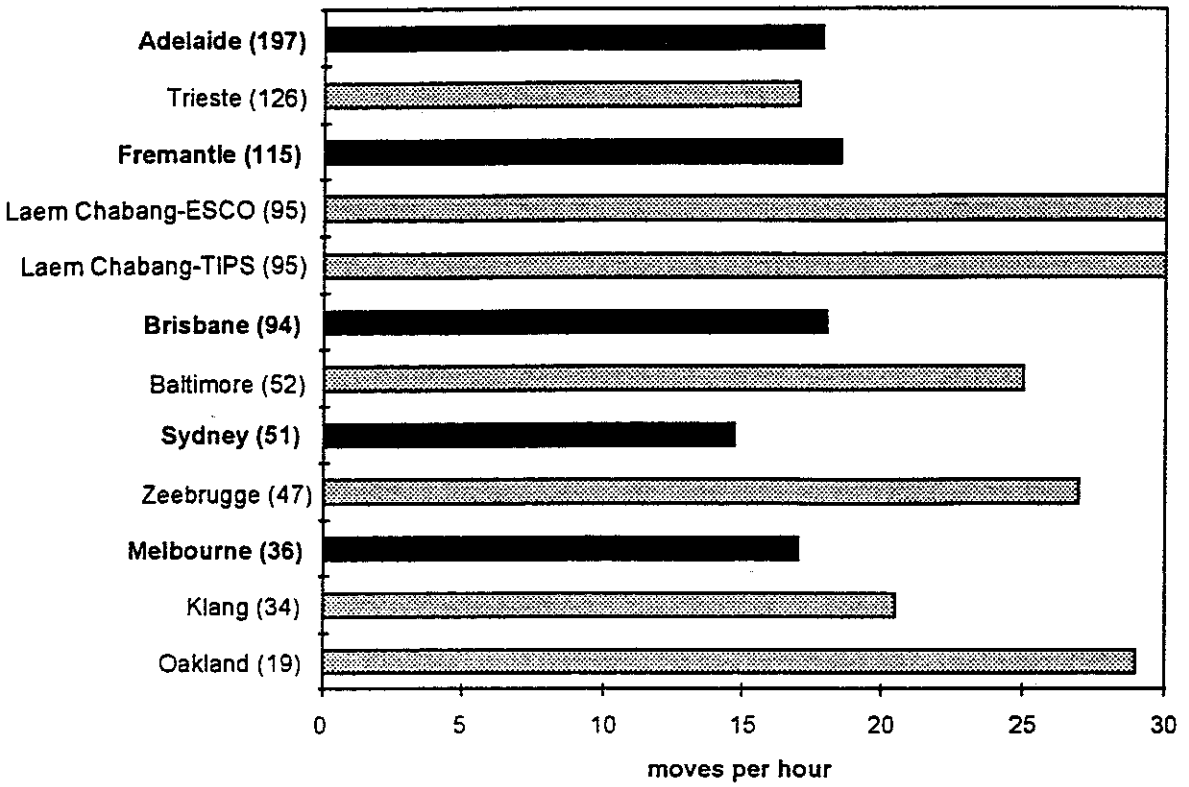
It could be concluded, therefore, that best practice crane rates of around 30 *moves* per hour can be achieved at ports irrespective of size. This target is about double that currently achieved at Australia's major ports. Moreover, the Marconsult (1994 p. 162) study concluded that many ports in Europe, and elsewhere, are:

> ... moving towards the target of 30 moves per hour and crane which for many years is the standard of ports like Rotterdam and Antwerpen. No ports show productivities under 20 moves [per hour] operating on ships of a large size

While crane rates can reflect both the technical capability of waterfront equipment and the effectiveness of labour arrangements, a key determinant of ship turnaround times is the rate at which containers can be loaded and unloaded off ships. Known as the ship working rate (number of containers moved per hour the ship is being worked on), this indicator combines both the speed of individual cranes as well as the number of cranes a stevedore can apply to an individual ship. It would generally be expected that this measure would disadvantage the smaller ports relative to the larger ports. This is because with larger ships and higher volumes of containers, the larger ports can

operate with a high crane intensity (average number of cranes operating on a ship) yet also maintain high utilisation of each crane.

Figure 4 Crane rates[a] for comparable size container ports[b], 1994



Notes: (a) The average number of container moves achieved by a single crane in the time that vessels were actually being worked These rates differ from those in figure 7.1 as they measure moves per hour and not teus per hour (b) The numbers in the brackets represent the port's international ranking in terms of annual teus

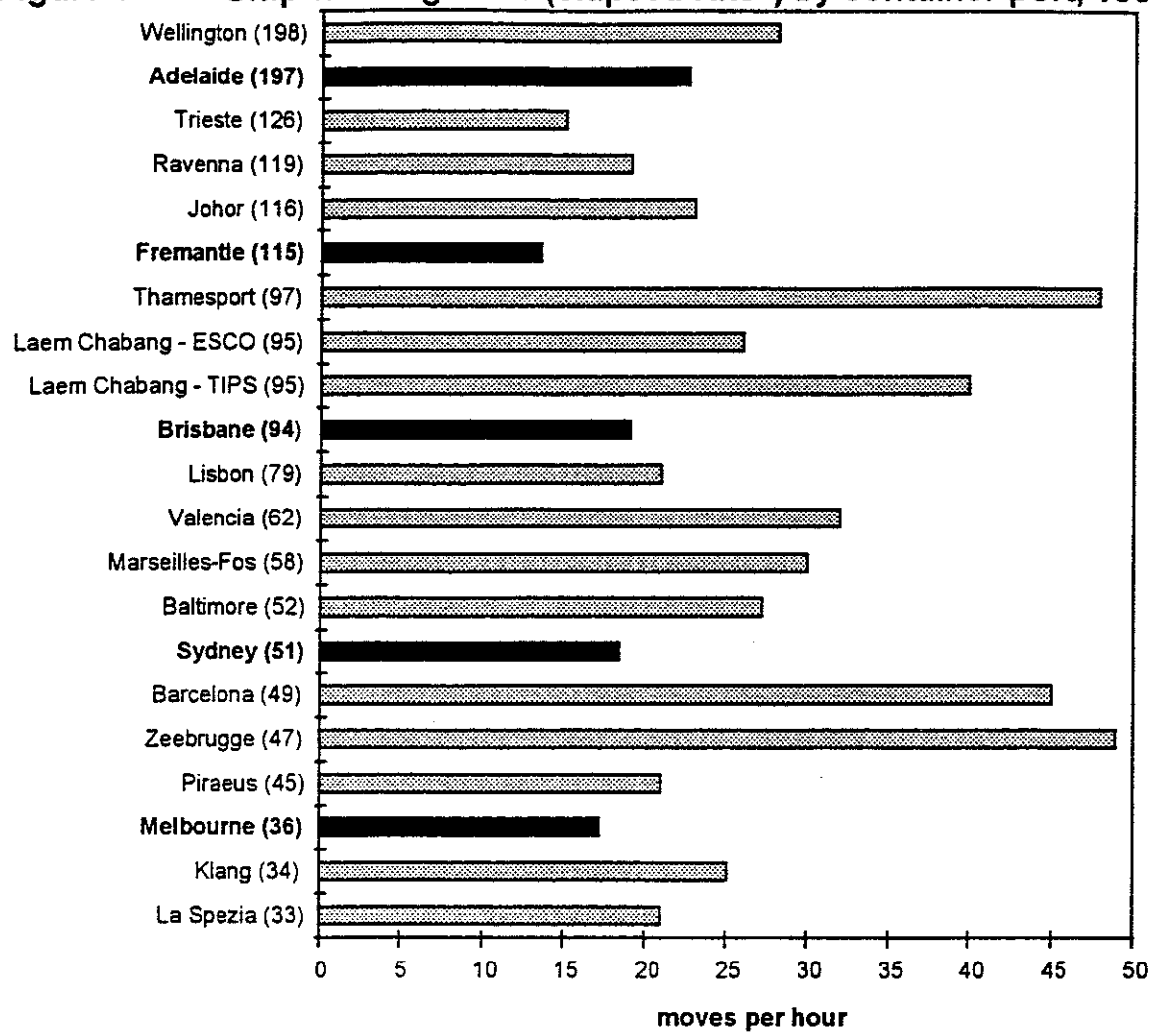
Source: BIE 1995

Over the WIRA process quite substantial increases in ship working rates were achieved at Australia's three largest ports of Melbourne, Sydney and Brisbane (BTCE 1995). For example, between June 1990 and September 1992 the ship working (elapsed) rate increased from 14.8 to 25.6 teus per hour in Brisbane and from 17.1 to 22.6 in Melbourne. The BIE's earlier study revealed that ship rates at Australian ports fell just short of those achieved in similarly sized ports overseas. With the exception of Fremantle, and possibly Adelaide, ship working rates have generally declined across all Australian ports since September 1993.

The international comparisons of ship (elapsed) rates for 1994 reflect the recent declines in performance on the Australian waterfront. Rather than falling just short of overseas performance, ship rates in Australia consistently fall well short of that achieved overseas (Figure 5). Indeed, ship rates at Melbourne and Sydney (17.2 and

18.4 *moves* per hour) are 25 to 30 per cent lower than that achieved at the smaller ports of Johor and Wellington (23 and 28 *moves* per hour).

Figure 5 Ship working rates (elapsed rate[a]) by container port, 1994[b]



Note: (a) These estimates are not directly comparable to the elapsed rates published by the BTCE The estimates here are based on moves per hour whereas the BTCE 's estimates are based on teus per hour. The data for this figure is contained in Table F9. The numbers in the brackets represents the port's 1993 world ranking by container volume.

(b) The survey information is supplemented by published information on the European ports for 1993

Source: STM 1995

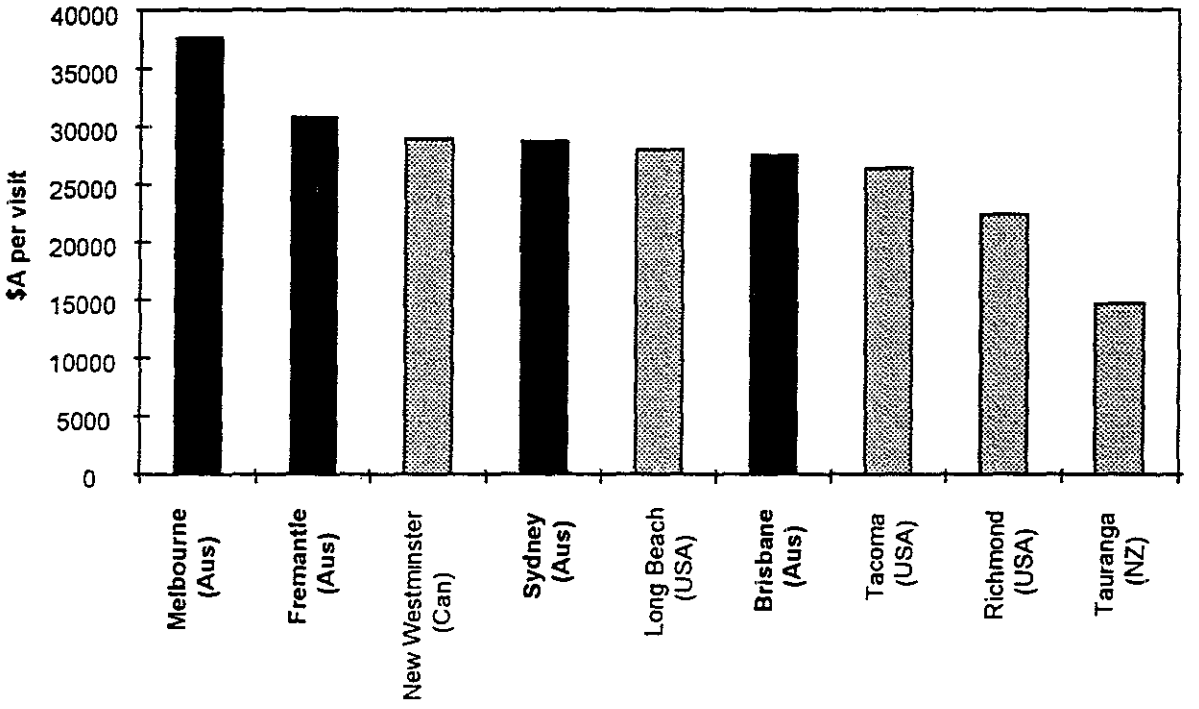
The performance gap relative to some of the leading, similarly sized, ports is even greater. For instance, in 1994 the ship rates at Zeebrugge and the Laem Chabang - TIPS terminals were 2 to 3 times greater than those achieved at the majority of Australian ports.

Further labour shedding may not be the answer, as an Australian stevedoring employee currently moves as many containers in a year as his/her overseas counterpart. The problem is that he/she cannot move containers as quickly. This suggests that there are continuing problems with equipment and work practices.

5. Break bulk

Break bulk covers traditional waterfront activities consisting of cargoes which generally defy containerisation; such as steel coil, timber, newsprint and motor vehicles. For its analysis of break bulk operations the BIE used detailed benchmarking work undertaken by BHP Transport's shipping operations. BHP Transports's analysis suggests that Australia's *non-terminal waterfront charges* for break bulk cargoes are high by international standards. Indeed, the lowest charges in Australia are comparable to the more expensive ports on the west coast of North America (figure 6).

Figure 6 Break bulk non-terminal charges, 1994



Notes: (a) These estimates are based on a 17 000 dwt vessel with a cargo exchange of 700 tonnes of steel, 25 teus 400 tonnes of newsprint and 250 tonnes of timber. It does not include terminal and cargo handling charges which represent around 60 per cent of waterfront charges for containers

Source: BIE 1995

During 1995 some Australian port authorities further reduced their charges. However, an even larger gap existed between waterfront charges in Australia and those applying to ports in the southern United States, Mexico and Panama. Port authority and ancillary charges are the main cause of the differences in waterfront charges between Australian and the southern American ports.

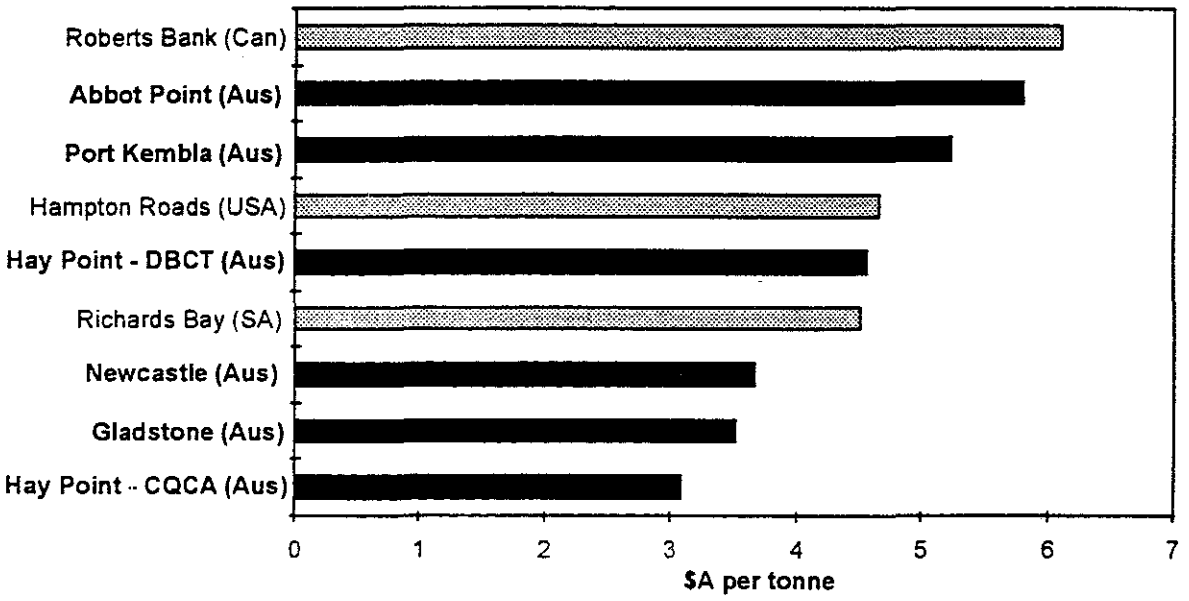
BHP Transport also compared the productivity of loading operations for a number of its steel products. *Stevedoring costs* in Australia are consistently higher than for a wide selection of ports in Asia, Europe, North and South America. These higher loading costs reflect a combination of low productivity and relatively high wages. It seems that reforms to work practices and modernisation of facilities should be high priorities.

6. Coal

Australia's port-based bulk commodity terminals are highly mechanised and efficient operations: the coal terminals examined are no exception. Worldwide, coal terminals are closely integrated with mining and land transport operations. This, along with the relatively small number of organisations involved in mining, handling and transporting coal, has ensured that close commercial partnerships have developed.

Waterfront charges for coal handling in Australia are amongst the lowest in the world (figure 7). Even the more expensive of the Australian coal ports are on a par with their international counterparts.

Figure 7 Waterfront charges by coal port, 1995



Notes: (a) Includes all waterfront based charges such as pilotage, towage, mooring, navigation, port authority and terminal charges calculated for a 120 000 dwt vessel with a load of 95% of its capacity
Source: BIE 1995

Australia's low coal waterfront charges are generated in part by high capital utilisation in the coal terminals (table 1). *Capital utilisation* at Australia's three largest coal terminals at Newcastle, Hay Point and Dalrymple Bay are consistent with that achieved at the much larger terminal at Richards Bay in South Africa. The relatively high terminal charges at the smaller Abbot Point terminal (one fifth the size of the Port Waratah terminal in Newcastle) are consistent with the low observed terminal utilisation and pilot productivity And *availability* of coal loaders at Australian terminals is on a par with overseas

Table 1 Capital utilisation by coal terminal, per cent (1993-94)

Terminal	*Loader availability %*	*Average loader rate (t/hr) as a proportion of nominal rate (t/hr) %*	*Annual throughout as a proportion of annual capacity %*
Richards Bay	95	62	90
Newcastle — PWCT	**95**	**64**	**103**
Hay Point — CQCA	**95**	**72**	**101**
Hay Point — DBCT	**95**	**83**	**83**
Gladstone — RGT	**95**	**63**	**72**
Newcastle — KCT	**95**	**41**	**68**
Roberts Bank	-	-	77
Hampton Roads — Dominion	-	-	54
Port Kembla — PKCT	**99**	**64**	**70**
Kaltim Prima	95	64	75
Vancouver — Neptune	-	-	77
Abbot Point	**95**	**76**	**43**

Source: BIE 1995

The performance of Australia's coal ports appears to provide this important export industry with a slight edge over competitors, although there is scope for further improvement in some areas. Given the highly competitive nature of the world coal market, it is important to protect this advantage and improve upon Australia's good performance.

6. Conclusions

The major findings of the 1995 BIE international benchmarking study were that:

- waterfront container charges are high in Australia, but not as expensive as some ports in the United States;
- recent declines in container stevedoring productivity has resulted in Australia falling well behind similarly sized overseas ports;
- Australia's performance in break bulk urgently needs improving; and
- low Australian waterfront charges for coal are supported by high capital utilisation in the coal handling terminals.

In regard to container productivity, most overseas ports have moved ahead while Australia has stepped backwards. This highlights the need for waterfront reform to be viewed as a continuous process, and not a one-off event. It is essential that reforms implemented provide in-built incentives to continuously improve performance. Unless reforms tackle the causes of poor performance head-on they are unlikely to lead to sustainable improvements.

The productivity gains achieved during the WIRA process need to be consistently maintained over long periods before they can be expected to be reflected in revised ship schedules and further reductions in freight rates. It will be difficult for Australia

to develop a reputation as a reliable supplier of elaborately transformed manufactures if the timeliness and reliability deficiencies of container and break bulk operations are not urgently addressed.

This paper illustrates how international benchmarking in Australia has made a significant contribution to promoting yardstick competition and keeping the focus on how well we are doing relative to our international competitors — it is no use taking comfort from the fact that we are doing better than we used to if our competitors are improving their performance at twice the rate.

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