# Review of the Waterfront Industry Reform Program

## Report

The Bureau study examines the great changes which have been implemented in the stevedoring workforce and in its employment arrangements, the improvements which have occurred in the productivity and reliability of stevedoring services, and estimates the dollar value of the benefits which have been passed to the various categories of users of waterfront services.

Subject
Series
Date
A to Z
Search
Results
Print
Exit
GO BACK

BUREAU OF TRANSPORT AND COMMUNICATIONS ECONOMICS

# Review of the waterfront industry reform program

## Report 91

Australian Government Publishing Service, Canberra

ISSN 1034–4152
ISBN 0 644 45135 1



Printed by the Australian Government Publishing Service

# FOREWORD

The process of waterfront reform, especially as it concerned reform of stevedoring arrangements, has involved a large commitment of political and administrative effort by the Commonwealth, as well as a substantial investment of taxpayers' funds. The effectiveness of the reforms is thus a matter of considerable public interest.

The Portfolio Evaluation Plan for the Maritime Policy Division of the Department of Transport for the calendar years 1993–1995 required that a review of the effectiveness of the Waterfront Industry Reform Process be conducted. The review would examine the nature of the reforms which have been put in place, how they have affected efficiency on the waterfront, and the extent to which the benefits have flowed to the users of shipping services.

This BTCE study has examined the great changes which have taken place in the stevedoring workforce and in its employment arrangements, and the improvements which have occurred in the productivity and reliability of stevedoring services, and has estimated the dollar value of the benefits which have been passed to the various categories of users of waterfront services.

Members of the team, led by Neil Gentle, were Neil Kelso, Josephine Salmi and Stephen Wheatstone. Material prepared by Anthony Carlson and Robert Higgins was also drawn on for the report.

We would like to thank the various waterfront participants, including stevedoring companies, shippers, shipping lines, and union officials, for their cooperation in the course of the study.

Sue Elderton
Research Manager
Air and Sea Transport Branch
Bureau of Transport
and Communications Economics

David Anderson
Assistant Secretary
National Shipping and
Infrastructure Branch
Maritime Policy Division
Department of Transport

Canberra
March 1995

## CONTENTS

## FIGURES

## TABLES

## RECOMMENDATIONS

1. Labour arrangements in the stevedoring industry should continue to operate on an enterprise basis.

   The negotiation of successive enterprise agreements by the industry parties can be expected to result in further efficiency gains.

2. Regular independent monitoring of prices and other stevedoring indicators should continue, in order that the level of performance over time can be gauged.

   Consideration should be given to extending the level of monitoring in the area of non-containerised general cargo.

3. Attention should also be paid to the rate of progress made by the industry parties in the following areas:

   - achieving more flexibility in the use of overtime, casual, and permanent part-time employment;
   - increasing multi-skilling and multi-tasking, including with regard to maintenance;
   - encouraging employee training as a means of career advancement, rather than just as multi-tasking;
   - implementing more effective incentive schemes; and
   - introducing measures to reduce idle time in non-integrated port labour force regional ports.

# ABSTRACT

Reform of the waterfront represented a key test for microeconomic reform. The waterfront had problems entrenched over previous decades, and a history that did not augur well for the introduction of reforms.

The process of waterfront reform, especially as it concerned reform of stevedoring arrangements, involved a large commitment of political and administrative effort by the Commonwealth, as well as a substantial investment of taxpayers' funds. The effectiveness of the reforms is thus a matter of considerable public interest.

The Maritime Policy Division of the Department of Transport, therefore, as part of its Portfolio Evaluation Plan, asked the BTCE to examine the nature of the reforms put in place, how they have affected efficiency on the waterfront, and the extent to which the benefits have flowed to the users of shipping services.

The Bureau study examines the great changes which have been implemented in the stevedoring workforce and in its employment arrangements, the improvements which have occurred in the productivity and reliability of stevedoring services, and estimates the dollar value of the benefits which have been passed to the various categories of users of waterfront services.

Areas examined include:

- labour reform, including its effects on employees' attitudes, workforce structure and productivity, training, safety, maintenance, industrial disputes, and integrated port labour forces;

- the efficiency, productivity and reliability of container stevedoring, non-containerised general cargo stevedoring, container depots and bulk cargo stevedoring; and

- the distribution of the benefits of stevedoring reform, including reductions in stevedoring costs, reductions in stevedoring prices, reductions in ship time costs, the benefits passed on to shippers, quality of service benefits, and the distribution of benefits to Australians and foreigners.

# EXECUTIVE SUMMARY

## MAIN FINDINGS

Waterfront reform has been successful in achieving substantial benefits for the waterfront industry and its customers. However, the results are not uniformly spread across the industry, and there are some recent indications of a drop in stevedoring performance below the levels reached by the end of the Waterfront Industry Reform Authority (WIRA) program. Ongoing monitoring of stevedoring performance is recommended.

- The WIRA process has resulted in a smaller (reduced by 57 per cent) and younger (by 10 years) workforce (chapter 2).
- The Enterprise Agreement (EA) system is functioning, and will continue to provide long-term benefits, both to the industry and to Australia. The second, and subsequent, rounds of EA negotiations should bring about further change, making the industry more dynamic and competitive (chapter 2).
- The EA system has resulted in a company ethos developing, although attitudinal change has been particularly slow in Sydney and Melbourne (chapter 2).
- Integrated port labour force agreements have resulted in much lower port costs, and idle time dropping to zero, while minor ports elsewhere continue to experience high levels of idle time (chapter 2).
- Ship time lost through industrial disputes is down by 75 per cent despite time lost per employee continuing to be as high as before the WIRA process (chapter 2).
- Time lost through accidents has decreased by 88 per cent (chapter 2).

- The most significant stevedoring performance improvements have occurred in container and bulk terminals (chapter 3 and appendices II, IV and V).
- Container crane productivity increased by 50 per cent, and net ship working rates by 64 per cent, during the WIRA process (appendix IV and chapter 3).
- For bulk cargoes, labour productivity improved by about 60 per cent over the WIRA period, and appears to have improved further since then (chapter 3).
- For non-containerised general cargo stevedoring, tonnes per person-shift doubled during the WIRA period for dry cargoes, and increased by about 70 per cent for refrigerated cargoes. Quality of service has improved in some cases (chapter 3).
- National average cost to the stevedore of loading or unloading containers declined by $76 per teu or 29 per cent between 1990 and 1993 (chapter 4 and appendix II).
- Container stevedoring prices paid by vessel operators decreased by a national average $61 per teu, or 24 per cent, between 1990 and 1993. Vessel turnaround times have also improved (chapter 4 and appendix II).
- Competition has forced vessel operators to pass forward to shippers most of the savings received from reductions in stevedoring prices. Reductions in freight rates and terminal handling charges (where these apply) have exceeded the reductions in stevedoring charges in most trades (chapter 4 and appendix III).
- The BTCE estimates that the value of the benefits to all shippers in 1993 totalled $276 million, of which $200 million accrued to Australians (chapter 4).

## BACKGROUND

In 1989, the Government announced a three-year program to reform the stevedoring industry. The fundamental objective of the program was to achieve increased efficiency on the waterfront. The changes were to be implemented under the terms of an In-Principle Agreement (IPA) negotiated between the ACTU, stevedoring employers, stevedoring

unions and the Government (under the auspices of the Waterfront Industry Reform Authority [WIRA]).

The IPA involved a move from industry-based to company employment and the creation of career structures in the industry, with suitable training and incentive arrangements. The size of the workforce was to be reduced through voluntary redundancies, and its age distribution improved by recruitment of some younger workers. Awards were to be restructured to improve efficiency, and union coverage rationalised. The efficiency of small ports was to be improved, and bulk loading employment was to be in accordance with operational requirements.

Following the completion of the waterfront reform program on 31 October 1992, it was appropriate to review the nature of the reforms implemented in the stevedoring industry, and the impact they have had on the users of shipping services.

## LABOUR REFORM

The WIRA reform process has yielded results that vary between ports and stevedoring establishments.

Overall the process of introducing company employment through the enterprise agreement (EA) system has brought about positive benefits to the industry. The next round of EA negotiations should facilitate further changes, making the industry more dynamic and competitive.

New job structures have created opportunities for much needed career paths for stevedoring employees through training for multi-skilling and multi-tasking.

In reducing the size of the workforce the WIRA process was a great success, achieving a reduction of 57 per cent. However, disputes in early 1994 suggest that compulsory redundancy as a last resort in the major ports is much more difficult than envisaged in the In-Principle Agreement.

While the present workforce is definitely younger, it remains largely middle-aged due to limited recruitment that has occurred. There are few workers under 30 years of age. However, recruitment of new workers in late 1994 and early 1995 will improve the age distribution.

## Attitudinal change

In most ports outside Sydney and Melbourne a company ethos is developing, and as companies and their labour forces refine their enterprise agreements (EAs), further gains in labour productivity and efficiency can be expected. Unfortunately, in Sydney, Melbourne, and a small number of minor ports where competition is weaker, the EA process has not been as successful and attitudinal change has been slower to develop.

Management and union attitudes have been formulated by the lengthy history of mistrust on the waterfront. As a consequence of the 'closed shop' nature of waterfront employment, the MUA has considerable power to influence how the industry operates. For example, the MUA is able to largely influence the extent to which casual labour is used. Shippers and stevedores expressed the view that in the major and some minor ports the closed nature of the industry and the history of mistrust combined to cause workers to still give primary loyalty to the union rather than to the company employing them. Both management and unions need to work cooperatively to develop attitudinal change to find solutions to remaining problems and future ones that will emerge.

## Labour rigidity

In early 1994 idle time levels, high levels of overtime and low levels of casual employment indicated labour flexibility was far from ideal. Flexibility had improved, but the industry still had a major concern about labour rigidity in regard to the mix of overtime, idle time and casual employment relative to the size of the permanent labour force. The introduction of guaranteed wage employees and Australian Vocational Certificate (AVC) trainees and recruitment of new casuals following the second round of EAs have created an environment in which labour flexibility can be greatly improved. The increased flexibility will allow reduced idle time and overtime payments as well as increased employment opportunities in stevedoring. The MUA has been a driving force in the development of the AVC trainee scheme.

However, the present constraints on the use of casual labour are adding to stevedoring costs. Under the present roster arrangements, casual labour is only used as a last resort, with overtime and double headers being worked before casuals can be employed.

The present structure of overtime payments is a logical disincentive to increased productivity. The industry is beginning to devise new arrangements to provide a real incentive for waterside workers to strive for incentive bonuses, rather than opting for de facto bonuses through overtime.

**Industrial disputes**

The WIRA process, through rationalising the number of unions and awards, has reduced demarcation disputes, resulting in a marked decrease in ship delays. Between 1989 and 1992 ship delays caused by industrial disputes dropped by about two-thirds. However, the level of industrial disputes is still high compared with other industries. The most recent data (for the year ended December 1993) appear to indicate a trend of rising disputation, with levels per employee in 1993 as high as those experienced prior to WIRA.

**Multi-skilling and career development**

Multi-skilling is one of the major successes of the WIRA process, and has had a positive effect on productivity, although much more can be done in this area. The new skill classification levels appear to be working well.

Training for multi-skilling is well under way. Some companies have extended multi-skilling across several areas, such as clerical and operations. Others do not appear to be doing as much, particularly with regard to the lower skill levels. Introducing multi-skilling into maintenance areas, and training maintenance staff to do work in other areas, have not progressed as well.

Integrated port labour forces, introduced in some Western Australian regional ports, have provided major port cost reductions by combining the local stevedoring and port authority workforces into a single body, administered by the local port authority. Burnie, Geelong and Darwin also have integrated labour forces, but to a lesser extent than the Western Australian regional ports. Since the WIRA redundancies, these ports have been able to avoid the high levels of idle time payments to stevedoring employees which are still evident in some Australian regional ports. Similarly, in some NSW and Queensland ports, stevedoring labour for bulk grain loading is provided by the grain

terminal workforce. Such integration of functions could well be more widely adopted.

## EFFICIENCY, PRODUCTIVITY AND RELIABILITY

There have been substantial improvements in efficiency, productivity and reliability in Australian stevedoring since the inception of the WIRA process. In general, the gains from the WIRA process appear to have been maintained. There are, however, indications of some deterioration in performance in recent times, but it is probably too early to say whether this represents a continuing adverse trend. Ongoing monitoring of stevedoring performance is recommended.

In container operations, crane rates improved substantially during the WIRA process, with crane rates in the five major ports averaging about 20 teus per hour during late 1992 and for most of 1993. This is an increase of almost 50 per cent from the 13.4 teus per hour of the December quarter of 1989. Changes to employment arrangements have led to fewer delays to ships while at berth. The combined result is a significant improvement in ship turnaround time at container terminals. However, there was some slippage during late 1993 and early 1994.

In non-containerised general cargo stevedoring, tonnes per worker per shift doubled during the WIRA period for dry cargoes, and increased by about 70 per cent for refrigerated cargoes. While systematic data are not available for the post-WIRA period, a fairly consistent view emerged that performance has since deteriorated.

For bulk cargoes, labour productivity improved by about 60 per cent over the WIRA period. This improvement appears to have been maintained since then.

## COSTS AND PRICES

Stevedores have achieved lower costs through a reduced workforce and increases in the productivity of those remaining. Although there have been reductions in the cost of handling some breakbulk cargo, and improvements in the quality of service that some breakbulk ship operators receive, the most significant improvements have occurred in container and bulk terminals.

Rivalry between the two major stevedores has contributed to price reductions for container ship operators. The cost structure of container terminals is one of declining average costs. Improvements in productivity resulting from the reforms have, in effect, created excess capacity in most container terminals. Under these conditions, terminal operators will be better off if they can attract more business, as long as marginal costs are covered by the reduced prices.

### Scope for further cost reductions

With labour costs comprising 55 to 75 per cent of terminal costs and labour numbers reducing by 57 per cent, the reduction in stevedoring expenses would have been between 31 and 43 per cent if there had been no change in unit labour costs. In fact, between 1990 and 1993, national average stevedoring expenses dropped by 29 per cent, including some reduction in interest costs. Some increase in wage rates was expected, and did occur with the introduction of the Stevedoring Industry Award 1991.

Areas identified by the BTCE where reductions in stevedoring labour costs seem most readily achievable (see chapter 2) include:

- increased use of casual or permanent part-time labour, in place of double headers (where the worker does two consecutive shifts) or of overtime;
- further implementation of multi-skilling;
- greater flexibility in the use of labour, for example in shift arrangements; and
- the wider use of integrated port labour forces or similar initiatives in those regional ports where high levels of idle time are still occurring.

In addition, Conaust and AS are both undertaking major programs to upgrade their capital equipment. These initiatives should result in additional productivity gains and, hence, have the potential to further lower stevedoring costs for waterfront users.

## BENEFITS OF WATERFRONT REFORM

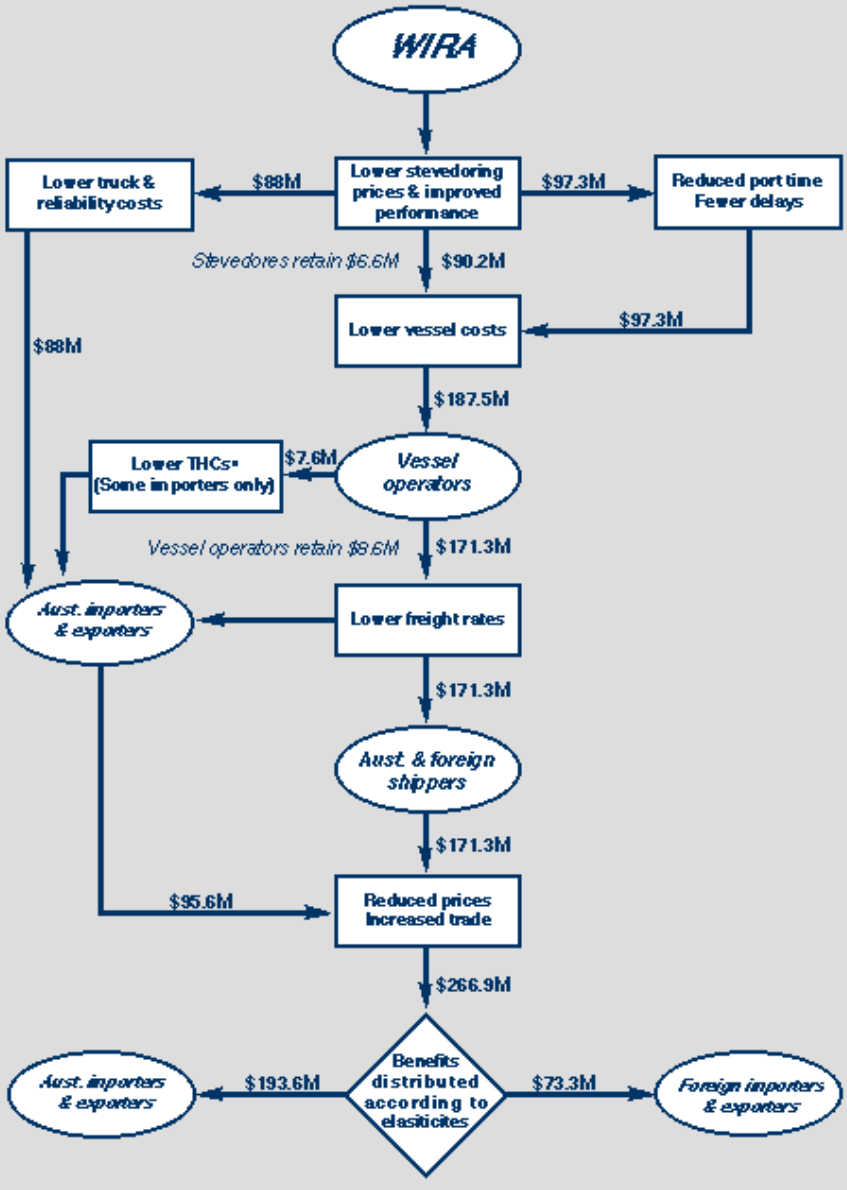
Overall the benefits of the reforms have been substantial. Almost all of the benefits were passed on to shippers; a small amount was retained

by stevedores in the handling of breakbulk cargo, and a similarly small amount was retained by ship operators. The BTCE estimates that the value of the benefits to shippers in 1993 totalled $276 million, of which $267 million went to shippers of non-bulk cargoes and $9 million to shippers of bulk cargo.

Based on available estimates of the incidence of transport costs, which are subject to some uncertainty, Australians captured about $200 million and foreigners $76 million.

The distribution of benefits to users of the waterfront is illustrated by figure ES.1, for the non-bulk sector only.

**FIGURE ES.1 DISTRIBUTION OF CONTAINERISED AND NON-CONTAINERISED GENERAL CARGO BENEFITS (EXCLUDING BULK CARGO BENEFITS), 1993**




a. THC—terminal handling charges.

*Sources* Table I.4, figure 4.2, appendices II and III.

BTCE

# CHAPTER 1 INTRODUCTION

In 1989, the Government announced a three-year program to reform the stevedoring industry. The fundamental objective of the program was to achieve increased efficiency on the waterfront. The changes were implemented under the terms of an In-Principle Agreement (IPA) negotiated between the ACTU, stevedoring employers, stevedoring unions and the Government (under the auspices of the Waterfront Industry Reform Authority).

The IPA provided the framework for the Government to commit $145 million toward redundancy payments on a dollar-for-dollar basis with industry. In December 1991, the Government increased its commitment to $165 million (WIRA 1992b, p.12). The stevedoring industry contributed $254 million, of which $235 million was to be recovered by a Statutory Tonnage Levy on cargo. The total cost of the redundancy program to both Government and industry was therefore $419 million.

Given its cost, it was appropriate to review the Waterfront Industry Reform Program following its completion on 31 October 1992. The Maritime Policy Division of the Department of Transport, as part of its Portfolio Evaluation Plan, requested that the BTCE examine the nature of the reforms put in place, how they have affected efficiency on the waterfront, and the extent to which the benefits have flowed to the users of shipping services. The terms of reference for the Review are contained in appendix VI.

## APPROACH TAKEN IN THE BTCE'S EVALUATION

The BTCE examined the changes which have been implemented in the stevedoring workforce and in its employment arrangements, and the improvements which have occurred in the productivity and reliability of stevedoring services, and estimated the value of the benefits which have been passed to the various categories of users of waterfront services.

Container terminals, conventional stevedoring and bulk terminals were considered. Major ports and regional ports were visited. Enterprise employment, changes in the structure and composition of the workforce, new job structures, and training programs were examined.

The BTCE study was overseen by a steering committee of officers of the Department of Transport and the BTCE. The committee comprised Mr Paul Merner, First Assistant Secretary, Maritime Policy Division (until his appointment to the Board of ANL), Mr David Anderson, Assistant Secretary, National Shipping and Infrastructure Branch, Dr Maurice Haddad, Director of the BTCE, and Ms Sue Elderton, Research Manager, Air and Sea Transport Branch of the BTCE.

The study commenced in February 1994, and a draft report was completed by 12 July 1994. The BTCE study team comprised one SOB (part-time on this project until 1 July 1994), one SPOC (also part-time on this project), one ASO6, and one ASO4. The final report was completed in February 1995.

## Method

To conduct this review, the BTCE made use of quantitative data on the stevedoring labour force and stevedoring performance, where available or collectable, qualitative assessments based on information gained in discussions with industry participants, and reasoned assessment of industry conduct, based on economic theory.

The evaluation was based on the following data sources and methods of analysis.

- The BTCE distributed questionnaires to stevedoring companies to collect data on the effects of waterfront reform on the stevedoring workforce, including its effects on workforce age and skill structures, training, safety, and industrial disputes.
- The BTCE held face-to-face discussions with stevedores; bulk grain terminal operators; union officials; shipping lines; a shipping agent; a freight forwarder; shippers of container, conventional and bulk cargoes; port authorities and State Government bodies in order to assess the effects of waterfront reform on industry attitudes, work practices, the implementation of integrated port labour forces, and other relevant matters.

- The BTCE drew on productivity data, collected from stevedores by the Department of Transport, in order to extend the data series published by WIRA, so as to measure changes in the productivity of container stevedoring. Prices Surveillance Authority (PSA) data were relied on for changes in stevedoring prices for containerised cargoes.
- For non-containerised general cargo stevedoring, a very non-standardised area, it was necessary to depend on qualitative assessments, based on the BTCE's discussions with industry participants,for performance in the post-WIRA period. PSA data were relied on for changes in stevedoring prices for non-containerised general cargo.
- The BTCE sought data on staffing and production rates during discussions with terminal operators, for comparison with WIRA data, in order to assess post-WIRA developments in bulk cargo stevedoring.
- Estimates for the distribution of the benefits of stevedoring reform were made using diverse sources of information, including PSA figures for reductions in stevedoring costs and reductions in stevedoring prices, PSA data and data from vessel operators on terminal handling charges (THCs), published and unpublished data on freight rates; BTCE data on reductions in ship time losses in Australian ports, and a previous BTCE study on the impacts of waterfront unreliability on shippers' and vessel operators' costs.
- Microeconomic theory was used to assess the degree to which the benefits were passed on via vessel operators to shippers, as lower freight rates or lower terminal handling charges or both. Use was made of more complex economic analysis and of available data on elasticities of demand and supply, in order to estimate how the benefits of waterfront reform were shared by Australian and non-Australian shippers.

## BACKGROUND TO THE EVALUATION

In the 1980s the term 'microeconomic reform' moved from being simply the parlance of economists into the general lexicon of the Australian public. Microeconomic reform was part of the strategy to help transform the Australian economy into a revitalised, competitive, economy allowing Australia to compete in the more demanding atmosphere of the 1980s and beyond.

The waterfront became one of the most important areas of microeconomic reform, and in many ways became a test of whether or not reform would proceed as hoped. Waterfront reform represented a difficult test for microeconomic reform, with problems entrenched over decades and a history that did not bode well for the introduction of reform.

Conversely, if reform could be achieved on the waterfront then the way was open for further reform elsewhere. The benefits from a more efficient, productive and reliable waterfront would also be substantial, with not only direct gains to be made by those involved in the reform process but, as the waterfront forms part of the transport chain, flow-on effects to be felt through the entire economy.

Labour arrangements prior to implementation of the reforms were essentially those developed following the Kirby (1977) conference in 1977 and detailed in the General Agreement. Labour was allocated to stevedores and ports through the operation of Federal and port coordinating committees. The Inter-State Commission (ISC) noted that this system involved:

> calculating a quota for each employer and allocating any labour in excess of the total quota among employers in accordance with their quota share (ISC 1988b, pp.58–9).

Under the 1977 agreement there was no surplus labour held in a pool; if companies required additional labour they could hire this from other companies on a daily basis through inter-company hire arrangements (ISC 1988b, p.86). A number of levies were established to fund industry leave, idle time payments, industry pension fund and redundancy payments.

Prior to the ISC inquiry, the stevedoring industry was characterised as having an industry focus in its labour arrangements. Permanent employment had been introduced in the 1960s to facilitate the training of employees in the use of the new technology then being introduced and also to foster the development of strong employee/employer relationships (ISC 1989a; 1989b, p.37). However, stevedoring employers considered that waterfront workers still identified more strongly with the union than with their employers.

The ISC (1989a, p.xv) found the waterfront industry displayed all 'the classic symptoms of an imperfect market', that is, ineffective management, poor workforce training, introspective industrial attitudes,

poor information flow, under-utilisation of expensive facilities, diffusion of responsibility and abuse of monopoly power.

The ISC (1989a, p.xv) described the waterfront as having:

> high costs, endemic unreliability, a high level of industrial disputation, inappropriate staffing levels and work practices, poor discipline, poor motivation throughout the industry and a pervasive lack of competition.

The power of the Waterside Workers Federation (now the Maritime Union of Australia) attracted a good deal of comment from the ISC. The ISC was especially concerned about the monopoly power of the union in the supply of labour to the industry. The ISC (1989a, p.133) commented that:

> in recent years this monopoly has been used to maintain high wages by preventing entry into the market of any labour that might be prepared to accept conditions different from those enjoyed by the WWF.

In addition to the monopoly on the supply of labour the ISC (1989a, pp.136–7) added that the

> strength of the unions' bargaining position results from the high cost to shipowners of any delays to vessels and hence the desire of shipowners, and on occasions shippers and governments, to expeditiously settle disputes even if this results in longer term cost increases to all industry participants.

The industry-based employment arrangements were believed to contribute to these tendencies by spreading the costs of dispute settlement across all companies.

The ISC was of the view that union monopolies were not able to exploit their monopoly position to the same extent as other monopolies. There was a degree of transparency and public scrutiny which moderated the extent to which the power was exercised. Although the ISC did not favour the ending of the monopoly, it did believe that the bargaining position of the employers should be improved.

The ISC recommended that this be done by the insertion of stand-down provisions in waterfront awards. The availability of the stand-down

provisions would increase the potential cost to the union of disputes. The provisions were to be available at 24 hours notice and subject to review by the then Conciliation and Arbitration Commission (ISC 1989a, p.260). However, the Government did not act upon this recommendation.

The ISC, in its conclusions and recommendations, sought to correct the problems it had identified by bringing about structural and attitudinal changes on the waterfront. The centrepiece of the report was the waterfront industry plan. The ISC proposed that an In-Principle Agreement be signed by the major parties in the stevedoring industry (Makin 1990, pp.83–4). The main strategy of the plan was to restructure the industry so that enterprise employment would replace the industry-based labour arrangements.

## EXPECTATIONS OF REFORM

Expectations of the waterfront reform program were many and varied prior to the June 1989 announcement by the Minister for Transport and Communications (Willis 1989). However, the expectations of the Government and those charged with the responsibility for implementing the reforms are the ones most relevant to this evaluation.

The Government's expectations of waterfront reform were outlined in 1989 by the Hon. Ralph Willis, MP, the then Minister for Transport and Communications. The Government saw the negotiation of an In-Principle Agreement as the 'foundation for the achievement of substantial waterfront reform' (Willis 1989, p.8).

The central element of the agreement would be the transfer of employment responsibilities to individual employers. For the enterprise working arrangements to be successful, they should ensure that the workforce had an adequate level and mix of skills, and was motivated to perform effectively. It was expected that the new employment arrangements would improve competition, enhance employer/employee relationships and reduce costs to shippers.

The high average age of the workforce was a significant factor to be overcome in the rejuvenation of the workforce. A redundancy program announced by the Government had the dual objectives of reducing the size of the workforce and recruiting 1000 new employees no older than 30 years of age (Willis 1989, pp.8,9).

Other matters the Government wanted in the In-Principle Agreement included (Willis 1989, pp.9–11):

- development of flexible supplementary workforce arrangements in the major ports with compatible arrangements in the smaller ports;
- restructuring of agreements and awards to enable improvements in work organisation designed to increase productivity, efficiency and reliability;
- compulsory redundancy to be allowed as a last resort for all employees hired after 31 March 1989 from the end of the three-year implementation period;
- commitment by both employers and unions to develop and support industry-based training schemes and enterprise-based training programs;
- agreement to arrangements to enable the effective contracting-out of maintenance work where it is more efficient than in-house facilities;
- introduction of measures to improve the efficiency of small and intermediate ports;
- employment arrangements for the loading and unloading of bulk vessels to be in accordance with efficient operational requirements; and
- agreement to rationalise union coverage at small ports, international container depots and bulk terminals.

## The In-Principle Agreement

The In-Principle Agreement set out what the parties believed could be achieved in practice. In that sense the agreement defines the expectations of those who had the responsibility for implementing the reform program. The agreement was generally consistent with the commitments the Government believed should be covered. Parties to the IPA were the stevedoring companies, the unions, the ACTU and the Federal Government.

The parties saw their objectives as (WIRA 1989, p.1)

> achieving an agreement which:
>
> - ensures a reliable, efficient and competitive industry through:
>   - more efficient management responsibility
>   - a more flexible and skilled workforce
>   - a rejuvenation of the age structure of the industry; and
>   - a more satisfying career structure for all employees.
> - achieves real productivity improvements.

The expectations of the reform program defined by the Government in the 1989 statement by Mr Willis (Willis 1989) and by the parties to the In-Principle Agreement provide a realistic basis on which to evaluate the program.

# CHAPTER 2 NATURE OF THE REFORMS

The major focus of the waterfront industry plan developed by the Inter-State Commission was the reform of stevedoring industry labour arrangements. This chapter examines the nature of the labour reforms implemented, while chapter 3 examines the impact of the reforms on efficiency, productivity and reliability, including labour productivity.

The ISC plan for labour reform had two stages. The first stage saw the development of an In-Principle Agreement (IPA), which set out agreed procedures for reforming the industry and the framework of the new labour arrangements (WIRA 1989).

The second stage was the actual implementation of the IPA, under the auspices of the Waterfront Industry Reform Authority. The implementation involved the establishment of enterprise agreements (EAs), negotiated between the employers and employees.

The IPA provided the means to:

- move to enterprise employment;
- offer redundancy and retirement packages for those wishing to leave the industry;
- implement improved arrangements for training;
- put in place improved procedures for the maintenance of equipment;
- implement improved dispute settlement procedures; and
- introduce supplementary labour.

Special arrangements were specified for container depots, small ports and bulk cargoes.

The WIRA process covered only stevedoring labour provided by members of the then WWF, now part of the Maritime Union of Australia (MUA), and other unions which traditionally provided waterside labour. It covered the handling of some bulk commodities (mostly bulk grain and fertilisers) but not others.

The term 'waterside labour' is used for members of these traditional waterside unions, whereas 'non-waterside labour' is used for stevedoring by members of other unions. 'Stevedoring' is the loading and unloading of ships cargoes.[1]

## COMPANY ETHOS AND EMPLOYEE LOYALTY

Prior to the reforms, the ISC commented that industry-based employment arrangements meant that workers identified more strongly with their union than with the company employing them. One major benefit of introducing individual EAs for each company was expected to be the creation of a more competitive commercial environment. Under the new arrangements, labour conditions and wages would be more closely related to the fortunes of the company. Because of this, it was expected that, in time, workers would more readily give their loyalty to the company. Attitudinal change reflecting this loyalty would greatly assist in the improvement of productivity and the introduction of innovation.

The BTCE found some improvement in employee/employer relationships and some development of a company ethos. Shipping companies have remarked in discussions with the Bureau that the improvement is most noticeable in the smaller ports where the

stevedoring workforce perceives its future lying with the success of the employer and where there is sufficient mutual trust to facilitate true industrial democracy.

In the larger ports of Sydney and Melbourne and some minor ports, port users indicated to the Bureau that the attitudinal change has been much slower; although some improvements have been made. The disputes in February 1994 affecting Australian Stevedores (AS) were perceived by many shippers, stevedores and shipping companies as putting the clock back to pre-reform days. However, those with some involvement in the dispute were more optimistic than those further away that the EA process was working.

**Job security**

Prior to the establishment of the reform program, a register of stevedoring employees was maintained. The register was originally established after World War II as a means of providing job security for stevedoring employees. It was later used for administering the collection of industry levies. The register was abolished in the 1994 amendments to the *Stevedoring Industry Finance Committee Act 1977.*

In discussions with many shippers and some employers regarding change in company ethos, the major criticism of the WIRA process was that it has not brought job security on the waterfront into line with other industries.

The IPA guaranteed job security for those who had been employed prior to the signing of the IPA on 31 March 1989. Those employed after this date would be subject to compulsory redundancy as a last resort after the 1992 cessation of the IPA implementation period (WIRA 1989, p.7).

However, in 1992 the parties to the IPA agreed that, following the cessation of the IPA implementation period, future employment arrangements, including job security, were to be decided at the enterprise level (WIRA 1992b, p.15). The conditions under which compulsory redundancy may occur is still a matter to be resolved. As was witnessed in the February 1994 dispute affecting AS, companies still have difficulty in reducing employment numbers through compulsory redundancy as a last resort.

The Stevedoring Industry Award 1991 (SIA) (WWF 1992) spells out conditions relating to termination of employment. Clause 8(e) lists the

conditions relating to termination of employment and dispute settlement procedures. The award allows for compulsory redundancies as a last resort. Similar conditions also existed in the Waterside Workers Award 1983, clause 44, but employers had equal difficulty in implementing them then.

Where the reform process is working well, shippers, employers and waterside labour all agree, to some extent, that attitudes are changing and a more flexible employment system is evolving. The effectiveness of the reform process depends on how closely the employees and employers can work together to advance the fortunes of the company as a whole.

In many ports outside Sydney and Melbourne, the financial future of stevedoring employees is dependent on the financial viability of their employers and of the shippers using the port. The waterside workers know that without improvements jobs will be lost, and often the viability of their local community is threatened. In these ports, it seems employees accept more readily that the employer has the right of compulsory redundancy as a last resort.

In bulk cargo stevedoring the WIRA process is working well. The main reason is the amount of competition. In recent years the bulk commodities using waterside labour terminals have been subject to fierce international competition. For waterside labour to survive, it must ensure the producers can continue to export their goods economically and reliably. The stevedoring employees know they have a job only as long as the stevedore provides competitive services.

For bulk terminal operators, there is a further factor in competition for union coverage of workforces at different terminals. If a terminal cannot compete, then another terminal staffed by labour covered by a different union may take over the stevedoring work. For example, this has occurred with the gradual replacement over the years of waterside labour with non-waterside labour at some bulk commodity terminals as new technology has been introduced. In these ports employees also apparently accept compulsory redundancy as a last resort.

In LCL container depots the situation is similar to that in bulk terminals, in that non-waterside labour depots provide fierce competition for waterside labour depots. Compulsory redundancy is a reality, as witnessed in 1994 when Conaust depots were closed and the workforce was laid off. In the three depots still using waterside labour, the workforces are aware that the fate of the Conaust depots' employees could befall them.

However, in the major ports of Sydney and Melbourne (and in some minor ports, primarily those where the prime commodities shipped must flow through that port), such competitive labour forces do not exist for containerised and general cargo. Shippers and the shipping lines calling at these ports have no real alternative. For example, most exporters in Sydney are unlikely to use Melbourne or Brisbane.

In these ports the reform process has not worked nearly as well as in those areas where employees' job security is linked to the fortunes of the employer. Stevedoring contracts may switch between companies, but the same ships will continue to visit the port, and the same cargo will need to be loaded and discharged.

Since the February 1994 dispute between AS and the MUA, a number of stevedoring employers have indicated their belief that the MUA will not hesitate to take industrial action if employers try to reduce numbers in the future. In response to the switching of contracts between stevedores, the MUA's preference is to arrange transfers of permanent employees between companies. The companies are totally opposed to such an arrangement, fearing a return to industry-based employment.

Clearly the ability to retrench surplus employees varies between ports. Where external competition is weak, the employers have difficulty in applying compulsory redundancy as a last resort. In ports where competition for the port's trade is stronger or union coverage of the stevedoring function is contestable, compulsory redundancy as a last resort is more readily achieved.

## SMALLER AND YOUNGER WORKFORCE

The Inter-State Commission concluded that there was an overabundance of aging labour and that work arrangements were acting as a barrier to skills development. Labour numbers had not adjusted to reflect technological changes (ISC 1989a, p.xix).

The Commission recommended that the waterfront industry's workforce be reduced by a net 2000 employees over a three-year period. To help rejuvenate the workforce and to restructure the industry (WIRA 1989, p.vi) the reductions were to be achieved by 3000 employees leaving the industry and 1000 new employees of younger age being recruited.

## Size of workforce

During the three-year life of WIRA, a 57 per cent reduction in the size of the workforce was achieved. Retirement and redundancy packages were offered, and accepted by 4479 workers. A further 840 workers left under normal industry arrangements. The number of employees leaving the industry was well in excess of the 3000 originally envisaged in the IPA (WIRA 1992b, p.6). Recruitment, at 265, was well down on the expected 1000 new recruits. See table 2.1.

'With the progressive implementation of enterprise agreements and the consequent improved productivity, it became evident' (WIRA 1992b, p.12) to WIRA that a far larger reduction in labour was necessary than originally envisaged in the original IPA. Coupled with this, there was a downturn in shipping activity due to the recession, which created a reduced demand for stevedoring labour. Hence the industry parties agreed that a much larger reduction in labour than originally recommended by the ISC should occur.

Since the 1992 conclusion of the WIRA process, the stevedoring workload has increased, but the actual number of stevedoring employees has decreased (although no recent complete data set of stevedoring companies' labour is available, information received from stevedores indicates that numbers have been static or have dropped slightly). The BTCE estimates that the number employed in stevedoring activities was still about 3800 (post-WIRA number) in early 1994. Employment numbers in 1995 are probably higher following new recruitment that commenced in late 1994.

## Age of workforce

The ISC's plan for the recruitment of 1000 new and younger employees was aimed at generating a more dynamic workforce. The hope was that the greater enthusiasm of younger people would foster an attitude more accepting of change. However, the small number of new entrants to the industry during the WIRA process limited this regeneration strategy.

A further issue is that those who left the industry did so voluntarily and it is likely a number of skilled employees were lost. Although the age distribution of the workforce has shifted towards a younger average age, it is not clear that the skill level better meets operational requirements.

Table 2.2 shows the age distribution of stevedoring employees prior to, and after, the WIRA process. The average age decreased from 49 years in 1989 to 41.5 at October 1992 (WIRA 1992b, p.31). Although the 1993 data provided to the Bureau did not allow precise estimation of average age, a rough estimate placed the average age at almost 44 years at December 1993.

**TABLE 2.1 RETIREMENTS AND RECRUITMENT OF STEVEDORING EMPLOYEES**

| | *Start* | *Retirements* | | *Recruited* | *End* |
|---|---|---|---|---|---|
| *Period* | | *WIRA* | *Other* | | |
| Sep 89–Oct 92 | | | | | |
| Expected | 8 872 | 3 000 combined | | 1 000 | 6 872 |
| Actual | 8 872 | 4 479 | 840 | 265 | 3 818 |

*Source* WIRA (1992c).

**TABLE 2.2 AGE DISTRIBUTION OF STEVEDORING EMPLOYEES**

| | *Age group (years)* | | | | | *Total* | *Mean age* |
|---|---|---|---|---|---|---|---|
| *Date* | *< 20* | *20–29* | *30–39* | *40–49* | *≥ 50* | *employed* | *(years)* |
| Sep 89 | 19 | 338 | 1 203 | 2 848 | 4 381 | 8 872[c] | 49.0 |
| Dec 89 | 23 | 356 | 1 146 | 2 788 | 4 388 | 8 701 | 49.1 |
| Dec 90 | 21 | 416 | 1 017 | 2 541 | 4 151 | 8 146 | 49.0 |
| Aug 91[a] | 42 | 388 | 929 | 2 431 | 3 445 | 7 235 | 48.2 |
| Dec 91 | | | Data not collected | | | 5 707 | 45.7 |
| Oct 92 | | | Data not collected | | | 3 818 | 41.5 |
| Dec 93[b] | 0.2% | 8.4% | 2.3% | 47.7% | 21.4% | 3 800 | 43.7 |

a. AEWL stopped collecting these data in August 1991.

b. Estimate based on submissions received from most stevedores.

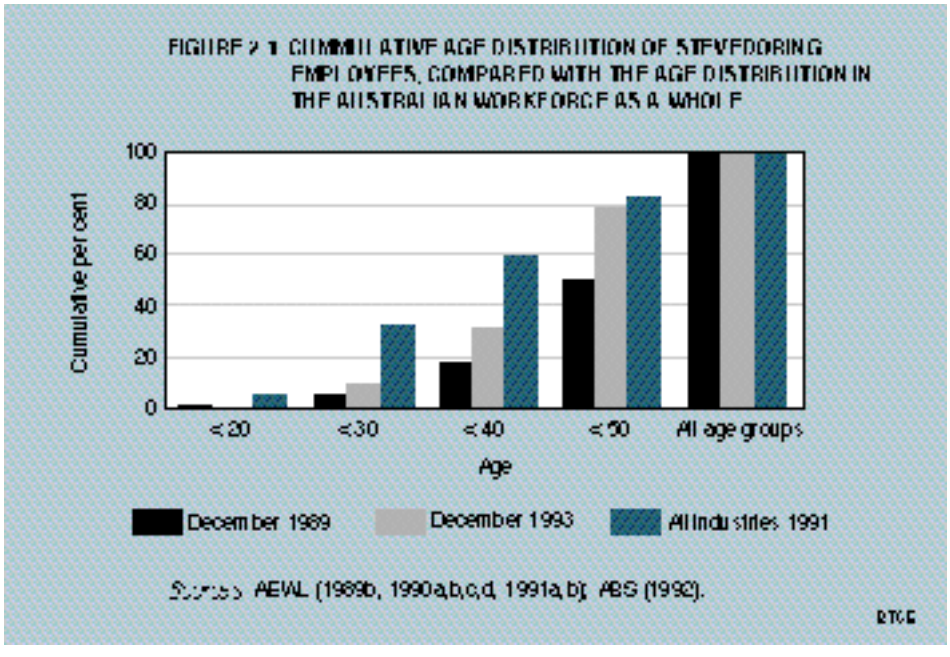
c. WIRA revised total; original sub-totals (as reported in AEWL, September 1989) add to 8 789.

*Sources* AEWL (1989 and later issues); WIRA (1992c); personal communications from stevedoring companies.

At December 1993, 31 per cent of the workforce was less than 40 years of age, compared with 18 per cent in December 1989. The proportion over 50 years of age dropped from 50 per cent in December 1989 to 21 per cent in December 1993 (see table 2.2). The objective of removing a large proportion of the older workers from the industry was largely achieved. The effect of the departures from the industry is more clearly seen in the cumulative distribution in figure 2.1.

Despite this improvement in the age profile, more than two-thirds of the workforce was over 40 in December 1993. There are still very few younger people employed in the industry. In December 1993 only 9 per cent of the workforce was less than 30 years of age. As shown in figure 2.1, the proportion of workers over 50 years old was still higher than the proportion for permanent workers in all industries, and if entry remains static over the next decade the industry will again have most of its employees aged over 50.

However, prospects had brightened by late 1994, when employers were again recruiting new employees as a result of new EAs. The *Maritime Workers' Journal* (1994a) reported an agreed recruitment of 300 new employees and expected further recruitment following the completion of 60 more EAs.



## JOB STRUCTURE

In 1989 the Association of Employers of Waterside Labour (AEWL) identified 10 different job types (waterside workers, foremen, supervisors, watchmen, transport workers, shipwrights, first aid attendants, storemen and packers, clerks and tradesmen) (AEWL 1989b). Within each of these groups there were several different classifications. For example, there were five classifications of waterside workers:

- wharf or deck hand – basic rate
- forklift driver – basic plus 1 ticket
- backhoe driver – basic plus 2 tickets
- mobile swing crane – basic plus 3 tickets
- portainer and overhead gantry crane – earn highest rates

(Stevedoring Advisory Council 1994, pers. comm.)

In response to the IPA, new job structures were developed to cover all these classifications, and these are spelt out in the Stevedoring Industry Award (SIA).

The SIA became operative on 25 November 1991 (WIRA 1992b, p.11), and is still in force. The SIA replaces the previous 21 awards, and establishes uniform conditions of employment. Enterprise agreements are developed within the conditions specified in the SIA. The SIA does not apply to container depots, grain terminals or integrated port labour forces (WWF 1992, pp.3,4; AEWL 1993).

The SIA established eight classifications of stevedoring employment, although level 8 was not defined and is not used (table 2.3). Most stevedoring companies only employ stevedores in classes 1 to 6, with class 1 being a basic training grade for new entrants. Payment is made in accordance with the SIA Classification Structure. Across each grade a worker can work in one or several work skill areas — clerical, operational, maintenance, first aid and reefer.

The new job classifications are skills-based and provide career paths. All workers are to have access to accredited training at each stage. The standards of training are set by the National Training Advisory Council

**TABLE 2.3 STEVEDORING CLASSIFICATION LEVELS**

| *Level* | *Skills used in each classification level* | | | |
|---|---|---|---|---|
| | *Clerical* | *Operational* | *Other* | *Maintenance* |
| 1 | Induction and initial training | | | |
| 2 | Small equipment, ship and wharf duties, basic equipment servicing and basic clerical tasks | | | |
| 3 | Competency in operational, clerical skills plus | | | |
| | deal with receivals, deliveries, loading and discharge etc | heavy equipment, operate ship gear, basic servicing | first aid | semi-skilled maintenance (equipment and vehicle servicing) and use hand tools |
| 4 | Processing of information relating to cargo, labour and payroll | Operation of specialised and complex ship and shore equipment | Monitor, maintain and control reefer plant | Maintenance trade person or gearman duties |
| 5 | Assist and coordinate the work of lower level staff and liaise with supervisory staff | | | |
| 6 | Coordinate and supervise clerical areas | Coordinate and supervise stevedoring operations | | Maintenance trade person special class |
| 7 | Plan and coordinate integrated stevedoring operations (including maintenance) and labour in connection with vessels and/or cargo | | | |
| 8 | Not defined | | | |

*Source* WWF (1992, p.79).

(NTAC).[2] The award allows a worker to gain and use skills across more than one area, and also to be multi-skilled for many different tasks within an area (WWF 1992, p.79).

The changes in job classification provide opportunities for improved job satisfaction, multi-skilling and work flexibility. Both the MUA and employers agree that the new structures are working well.

Regional ports in Western Australia adopted a different approach to job rationalisation, which also included port authority workers. In these ports, the port authority and stevedoring labour forces were combined into a single labour structure under the port authority. The combined labour force is called an integrated port labour force (IPLF). Stevedores hire the labour they need from the port authority. In Burnie, Geelong and Darwin a variation to this has developed: stevedores use port labour to supplement their permanent workforces.

In some instances, some port authority employees became members of the MUA as a result of the integration process. Port authorities and port users in non-integrated ports expressed concerns that such a move in their ports would result in higher costs from expensive stevedoring award conditions flowing on to port authority employees, and a fear that the MUA would become too powerful. Other unions with large memberships in port authorities have also expressed their opposition to integration, particularly if integration is at their expense. As a result there is considerable resistance to the integration process in other ports, which at first sight might benefit from an integrated labour force.

A more detailed discussion of the job structures and impact of IPLF may be found later in the chapter.

## LABOUR FLEXIBILITY

In statistical terms, the arrivals of ships at Australian ports can be described as random.[3] The time ships spend at a berth is also highly variable. The combined effect of random ship arrivals and highly variable times at berth is a highly variable demand for labour. A labour force

---

2. Refer to the section below on Training.
3. An analysis of the inter-arrival times of ships arriving at Brotherson Dock in Botany Bay resulted in a distribution that was almost indistinguishable from a random distribution.

which is inflexible in the hours worked, the tasks performed and the subdivision of labour obviously increases the cost of stevedoring (ISC 1989a, p.36).

Prior to the WIRA process the ISC considered that labour practices were inflexible. The practice of equalising pay, by rotating employees through all tasks irrespective of ability, diminished incentives to develop skills and improve service. There were no rewards for better-than-average performance, or for providing better quality of service to clients of the company (ISC 1989a, p.183).

One of the major objectives of the WIRA process was to provide mechanisms to increase worker productivity. This was essential to allow reductions in the size of the workforce. The IPA provided an environment for productivity increases by encouraging increased labour flexibility.

## Labour flexibility following the initial enterprise agreements

There were four areas of labour flexibility which were improved by the WIRA process:

- flexibility in hours worked;
- flexibility in the labour used;
- flexibility in tasks; and
- multi-tasking or multi-skilling.

**TABLE 2.4 COMPARISON OF SHIFT STARTING TIMES**

| *Shift* | *Prior to reform* | *Post-reform (non-IPLF)*[a] | *Post-reform (IPLF)*[a] |
|---|---|---|---|
| Day | 7am–9am | 6am–9am | 6am–10am |
| Afternoon | 2.30pm–5pm | 1pm–5pm | noon–6pm |
| Evening | 10.30pm or later | 10pm or later | 9pm or later |

a. IPLF: integrated port labour force currently used in some WA ports and one Tasmanian port.

*Sources* EA (1992); IRC (1986); WWF (1992, p.29).

**Work hours flexibility**

Inflexibility in hours worked was a major obstacle to improving labour productivity (ISC 1989a, p.36). Prior to the WIRA process, the Waterside Workers Award 1983 (WWA) provided for a 35-hour week. The WWA of 1983 specified that up to three shifts per week may be extended by up to two hours. Any extension of the shift was paid at overtime rates (IRC 1986). The number of permanent employees was set to ensure there was sufficient labour available to meet normal peak demands. This meant that at other times there was an excess supply of labour.

Under the WWA, companies developing new rosters could only negotiate shift starting times within small time bands, which often did not meet the demands of shipping. Other than extending shifts for ship departures, they could only increase the labour supply by working double headers, or by calling in waterside workers for extra shifts.

With the introduction of the Stevedoring Industry Award (SIA) in 1991, shift allowances and weekly hours of work have not changed. What has changed is the flexibility of shift arrangements. Some users now consider stevedoring labour to be even more flexible than that of tugs or mooring operations. The EAs negotiated during the WIRA process allowed companies to have:

- greater flexibility in selecting starting times of normal shifts (see table 2.4), although once the roster is agreed to, the starting times are fixed until re-negotiated;
- the ability, when developing rosters, to vary shift length from seven hours, as long as workers average 35 hours per week over a specified number of weeks; and
- the ability to extend shifts either way by two to three hours overtime, with fewer limitations. Some EAs go beyond this, with one company able to extend shifts by up to five hours overtime.

***Flexibility in labour used***

The large variation in demand for stevedoring labour has always made it difficult to achieve good productivity on the Australian waterfront. Prior to WIRA, employers had little choice but to use permanent waterside labour to stevedore ships. Use of casual labour was minimal and hence stevedores had to balance large variations in demand for

labour by using overtime and employing more permanent workers than were necessary to meet normal demands. As a result idle time bookings were large during non-peak times and stevedoring was more expensive.[4]

In addition, agreements at that time ensured that all labour was given an equal opportunity to do work which received the highest penalty rates. The result was that employees were continually swapping jobs. Stevedores were critical of this arrangement because it did not allow them to encourage specialisation of labour and work was often done poorly. The agreements provided no rewards for becoming skilled beyond the basic ticket levels or any incentives for improving productivity. It prevented stevedores from allocating work based on skill and ability.

Because of overemployment of permanents and poor allocation of workers, overtime and idle time were considered by stevedores to be out of control. In the third quarter of 1989, idle time was as high as 25 per cent, while overtime representing 24 per cent of actual time spent stevedoring. At the same time, casual (supplementary) labour employed by stevedores represented only 1.5 per cent of stevedoring labour (DoTC 1990).

With the introduction of the SIA in 1991, employers negotiated a much more flexible employment structure. It allowed them new labour supply and allocation options to meet the demands of shipping. However, in early 1994, despite these improvements many shippers and shipping companies considered the supply and allocation of labour on the waterfront to be inflexible.

Inflexibility in labour use is best measured by studying three factors in balancing labour needs:

- idle time bookings, which if high reflect an oversupply of permanent labour;
- overtime bookings, which under the present award arrangements, can point to under-use of casual labour and a poor balance between casual and permanent labour; and
- casual labour employed.

---

4. Idle time — the time measured in full shifts during which employees are paid and are available for work, but are not required for work (ISC 1988b, p.43).

*Idle time*

A major expectation of the WIRA process was that idle time on the waterfront would be substantially reduced by improving the mix and use of different labour groups. The arrangements agreed to in the IPA in 1989 addressed the idle time issue. The new arrangements allowed the employment of a smaller permanent workforce, supplemented by use of overtime and casual labour to meet peak demands, instead of having to employ a larger full-time labour force that would meet most peak stevedoring demands but would be under-employed at other times. The expectation created by the IPA agreement was that idle time would disappear or reduce at least to levels of 2 to 3 per cent.

As shown in table 2.5, during the time EAs were negotiated as part of the WIRA process (1989 to 1991), idle time remained high. Between 1989 and 1991 it increased from 16 to 26 per cent of available person-hours for waterside workers.

In late 1993, nationally idle time averaged about 13 per cent. In the ports of Sydney and Melbourne idle time was about 8 per cent, while in minor ports it averaged around 34 per cent. The amount of idle time varied from zero to about 90 per cent, depending on company and location.

The high levels suggest that despite improvements in many locations, with some terminals and ports reporting no idle time, there was still considerable scope for further improvements in late 1993.

**TABLE 2.5 IDLE TIME FOR WATERSIDE WORKERS, MARCH 1990 TO DECEMBER 1993**

| *Quarter ended* | *Idle time for previous 12 months (per cent)* |
|---|---|
| March 1990 | 16.03 |
| June 1990 | 17.59 |
| September 1990 | 19.46 |
| December 1990 | 22.62 |
| March 1991 | 24.12 |
| June 1991 | 25.80 |
| December 1993 | 12.92 |

*Sources* AEWL (1990a,b,c,d, 1991a, 1991b); personal communications from stevedoring companies.

The view was expressed to the BTCE that one reason for the high level of idle time is the stevedores' concern that a low level of idle time would encourage union demands for an increase in the number of permanent employees.

An analysis of idle time for some ports and companies showed that idle time could be reduced further by extending multi-skilling between bulk and general cargo areas, by greater internal redeployment of staff between terminals of a company, and by using more casual labour and overtime.

Advice from stevedores suggests that, with a more appropriate deployment of labour, idle time could be reduced to about 3 per cent in most larger ports. In the smaller ports greater variations in demand for labour mean that reductions in idle time are much more difficult to achieve.

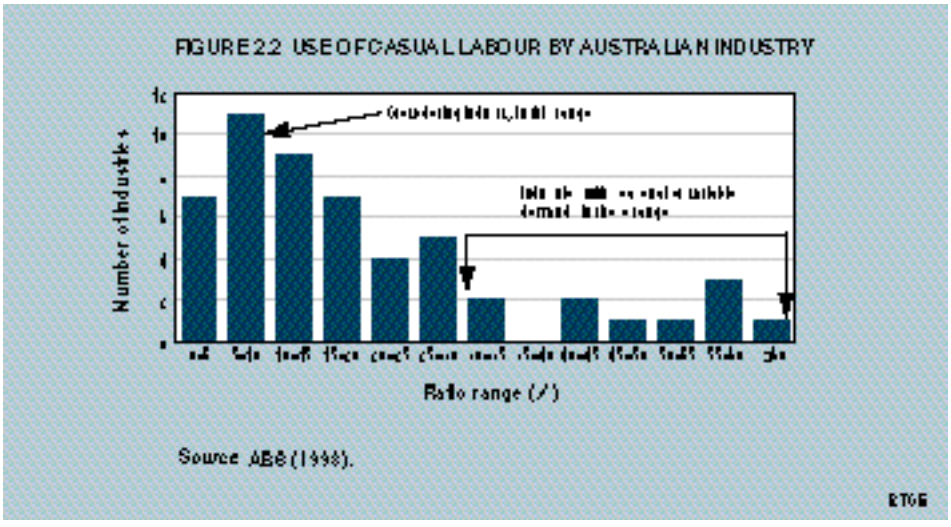
*Overtime*

Prior to WIRA, overtime for waterside workers was about 23 per cent of total hours worked. The EAs concluded during the WIRA period required shortfalls in labour demand to be met by using overtime, and especially double headers,[5] before the use of casuals. Based on information supplied by various stevedoring companies, overtime (including double headers) in early 1994 comprised about 16 per cent of total time worked. Of this, double headers make up about 5 per cent, and other overtime 11 per cent. Double headers were generally limited to two per week.

There are major differences in the amounts of overtime worked in the various terminals. In general, overtime in the ports of Sydney and Melbourne is about half that for other ports. The ratio of double headers to other overtime in Sydney and Melbourne is about 0.45, while in other ports it is about 1.05. The greater use of overtime and double headers in the other ports is not surprising, given the greater variation in demand in these ports.

---

5. Under certain conditions the SIA provides provision for an employee to work two consecutive shifts. The working of two consecutive shifts is referred to as a double header in the SIA (WWF 1992, clause 23(a)).




*Casual/supplementary Labour*

Under the WIRA process, the use of casual labour was made potentially easier with larger casual lists (consisting mainly of those who left the industry). However the MUA has generally discouraged the use of casuals. Prior to the introduction of the new waterfront trainee scheme in 1994, the introduction of new casual labour into the waterfront was frozen (MUA, pers. comm.). Understandably, the MUA does not want to see the industry return to a totally casual labour force and the abuses that went with it in the era before the Second World War.

At the beginning of the reform process, use of casual (supplementary) labour was minimal: 1.7 per cent for waterside workers in September 1989 (DoTC 1990). Use of casual labour made up about 6 per cent of labour used in early 1994, but there are large variations. In the major ports, the average increased from 0.5 per cent (DoTC 1990) to 5 per cent over the same period (stevedores, pers. comm.). Traditionally, the minor ports have used a higher proportion of casual labour, and this has not changed. In minor ports an average of 14 per cent of work was performed by casuals in September 1989 (DoTC 1990) and about 11 per cent in 1993 (stevedores, pers. comm.).

The use of casual labour in the stevedoring industry is low compared with other industries facing variable demands. Figure 2.2 illustrates the ratio of casual person-hours to total person-hours for Australian industries. Industries with similar ratios to stevedoring include public

administration, defence, electricity, gas and water supply. All of these are industries not usually associated with variable demands. In contrast, industries normally associated with variable demands and use of casual labour, such as retailing and hospitality industries, have casual to total labour ratios of over 30 per cent.

A large proportion of the present casual workforce are former permanent waterside workers made redundant during the reform process.[6] As these are generally older men, their numbers are reducing. Very few new additions are being made to the casual lists. Until recently, MUA policy did not permit expansion of casual lists,[7] and the MUA was able to enforce this policy by simply refusing to work with casuals not approved by the union.

*Task flexibility*

Prior to waterfront reform, the industry was subject to a multitude of awards, and was characterised by a low level of job satisfaction. The General Agreement 1977 specified job structures within the waterfront. This agreement was renewed every two years. In 1989, labour employment conditions covering employment on the waterfront were spelt out in 21 different awards, and most companies dealt with seven to eight unions (WIRA 1992b).

The In-Principle Agreement 1989 (WIRA 1989) stated that award restructuring would improve the efficiency, reliability and productivity of the waterfront. The parties would endeavour to rationalise the number of awards and unions, and establish a skill-related career path that would provide employees with incentive to acquire more training. This would lead to better jobs and more job satisfaction (WIRA 1989, pp.11–13).

At the end of 1993, each stevedoring company employed labour under one award (the Stevedoring Industry Award or variations of this award),

---

6. An important feature of the IPA 1989 (clause 11.4) specified that supplementary (or casual) labour lists would be determined on an enterprise basis at the conclusion of negotiation of enterprise agreements and shall include, but not be limited to, former industry employees.
7. The MUA is not totally opposed to the use of casual labour. The MUA preferred option is for fully trained people to enter the industry through casual employment. See the section on training for a description of the MUA proposal.

and dealt with up to three unions,[8] plus having an EA for each stevedoring site (stevedores, pers. comm.).

### Labour flexibility anticipated from the 1994–95 enterprise agreements

In the present round of EA negotiations, considerable progress is being made in the development of more flexible arrangements. A new class of employee (guaranteed wage employee) is now being recruited. Guaranteed wage employees are guaranteed work for two shifts per week, but can work more and can work overtime. They can be allocated to any shifts. Guaranteed wage employees do not receive a loading on their wage as do casuals, but do receive pro rata leave entitlements. Generally they must work their two shifts per week before permanent employees are allocated double headers. After permanent workers work their allowed two double header shifts, guaranteed wage employees are available for additional shifts before casuals are employed. There are obvious financial benefits since a guaranteed wage worker will cost less than a permanent full-time employee working on a double header shift.[9] Furthermore, stevedores would prefer to reduce the amount of double headers worked, because productivity and safety tend to suffer in the later part of double header shifts. MUA officials have also stated a preference for fewer double header shifts. The flexibility provided by guaranteed wage workers also assists in reducing idle time.

The workforce itself has incentives to work overtime, especially double headers, because of the very attractive financial rewards. However,

---

8. MUA, Electrical Trades Union (ETU) and Australian Marine Officers' Union (AMOU).
9. Overtime is paid at the shift rate plus ordinary pay. The shift rate for afternoon shift is 1.5 times the normal rate. Evening shift rate is twice the normal rate. Weekends or public holidays attract even higher rates, up to three times the normal rate. Hence overtime rates for normal working days shifts are:

   - day shift: double-time;
   - afternoon shift: double-time-and-a-half; and
   - evening shift: triple-time.

   Casual rates are paid at 20 per cent loading on top of the shift rate; hence casual rates are 1.2 times the normal day shift rate, 1.8times for the afternoon shift and 2.4 times for the evening shift. Hence a casual shift cost is from 20 to 40 per cent cheaper than the cost of the shift worked on overtime.

provisions in the new enterprise agreement for White Bay provide the option of accepting additional leave in exchange for penalty payments for the second double header shift worked in a week. The additional leave can accumulate at a rate that allows employees to have an additional week off after 10 weeks work. Apparently this option is proving popular for many employees (*Maritime Workers' Journal* 1994b).

The MUA and employers see this option as being appropriate for locations with highly variable demands and relatively small workforces. Apart from White Bay, the larger regional ports are seen as possible candidates for this option. In the regional ports there could be some variation in the leave arrangements, with the employer having greater discretion in when leave accrued through the working of double headers can be taken.

Under new EAs being negotiated in early 1995, agreement is expected on recruitment of new casuals. It is anticipated that the existing casual list, comprising mostly former stevedoring employees made redundant under the WIRA arrangements, will be abolished and a new list of younger people established.

The initiatives being put in place during the 1994–95 round of EA negotiations have the potential to increase significantly the flexibility with which labour can be deployed. Continued cost reductions from greater labour flexibility will be a key factor in generating ongoing gains from waterfront reform. It is imperative that employers and unions continue to cooperate in devising suitable arrangements to further increase labour flexibility.

**Multi-skilling and multi-tasking**

One of the big successes of the reform process has been the introduction of multi-tasking and multi-skilling. Prior to the WIRA process, a worker could only be assigned to one task for a complete shift, and this, coupled with skill demarcations, led to very high staffing levels to do a simple job. For instance, at Kooragang Bulk Facility, the labour required for unloading bulk cargoes has been reduced from 12 workers to 4, with most of the reduction due to multi-tasking. The crane driver is now able to control the crane from alongside the hatch and does the previous jobs of the hatchman and foreman.

Although multi-skilling is still in its early days, and the full effect of the changes will not be felt for some time, considerable progress has been made. The area where multi-skilling and multi-tasking have achieved

their greatest success is in bulk terminal operations. By using highly multi-skilled workers, stevedoring companies have been able to adopt efficient operational practices while also making significant reductions in staffing levels.

Multi-skilling success is primarily due to a very rigorous training program with a strong emphasis on safety. The proportion of employees attending training annually increased from 12.5 per cent in 1988–89 to 67 per cent in 1993.

The real benefit of multi-tasking is that now a worker can be assigned a multiplicity of tasks in one shift rather than one task only as in pre-WIRA days. This, coupled with multi-skilling across classification boundaries, has allowed large savings in labour requirements. In 1993, roughly 40 per cent of all workers gained an extra skill through training, although most of these skills were primarily in their existing work area and not across several work areas.

Discussion with the employers has shown that most workers have accepted multi-tasking and multi-skilling. But there are differences in how far multi-skilling across different work areas has gone. Some companies have reported little multi-skilling between different areas except in the higher supervision areas, while other employers record that a large proportion of their workers are now multi-skilled across more than one area. At present approximately 20 per cent of workers are skilled in more than one work area.

Multi-skilling was reported not to be occurring between workers carrying out maintenance and workers in other skill areas. Companies reported that staff on both sides were not interested in doing the others' tasks.

It was further commented to the BTCE that, although multi-skilling has allowed workers to be trained to do both clerical and operational work, this has mostly been in one direction only: many clerical workers have been trained to perform operational work such as driving straddle carriers, but relatively few operational workers have been trained in clerical functions.

The BTCE estimates that in the longer term at least a further 10 per cent savings in labour costs can be made by more and better use of multi-skilling and multi-tasking than is presently occurring. This includes not just further multi-skilling within a particular type of stevedoring operation but extension to other areas within a company, particularly

where a company has other stevedoring operations within a port. For example stevedores in Sydney could multi-skill workers to carry out container, general cargo and bulk stevedoring tasks. Such multi-skilling is already occurring in IPLF ports and it could easily be extended to other ports.

## INCENTIVE SCHEMES

All parties involved in the enterprise-based agreements were committed to improving productivity (WIRA 1989). Prior to WIRA there were no incentive schemes to improve productivity. If anything, the high overtime allowances worked as a distinct disincentive to productivity since workers were rewarded with overtime if they worked more slowly.

As at March 1994, about one-third of the stevedoring labour force were entitled to receive incentive payments under their EAs. On average these workers received an incentive payment for one in four shifts, but the variations were large, payments varying by company and port. Some ports reported incentive payments for 90 per cent of shifts while others, especially the larger ports, reported zero payments.

However, many of these schemes were considered not to be working satisfactorily. In general the incentive schemes were considered to be working best in the smaller ports where some company ethos has developed.

One major reason why incentive schemes are only partially successful is the relative size of the earnings from overtime compared with incentive payments. That is, there is more reward for the worker to work slower and obtain overtime than to work more productively and receive an incentive payment.

The way in which incentive payments are paid in some locations does not help. Some schemes are worked on a monthly or ship basis. This means the individual worker or gang does not see an immediate gain for increased effort. With overtime, they know immediately the payment they will receive. There is also a free rider problem. For example, in a ship-based scheme, one gang could work less productively and still receive the incentive payment if the productivity of other gangs was sufficient to exceed the productivity payment threshold.

In container terminals, the initial incentive schemes were based on the number of teus handled. A 40-foot container counted as two teus, even

though the amount of labour was similar to that for a 20-foot container. The basis for assessing productivity is now being changed to the number of lifts. Stevedores' contracts with ship operators are also tending to specify charges based on lifts, rather than differentiating between 40-foot, 20-foot and empty containers.

For non-bulk general cargo there are differences in views on the efficacy of incentive schemes. One view is that incentive schemes have been successful for this type of cargo. The other view is that the unpredictability of the standard of cargo presentation makes it almost impossible to set a standard of productivity for a useful incentive scheme. If the ship has a variety of cargo, the early gangs can pick the better presented cargo and achieve incentive payments, leaving the poorly presented cargo for later gangs.

However, for some shippers, there is a question of whether incentive schemes based purely on productivity are in the best interests of the waterfront. Some cargoes do not lend themselves to increased speed of handling. For example, there are limits to the rate at which cars can be moved out of a ship. Attempts at faster unloading can very easily lead to damage. The quality of the operation is an important attribute of the stevedoring process not captured in existing incentive schemes. Some shippers told the BTCE that undamaged cargo was more important to them than faster work with higher risk of damage.

## TRAINING

As part of the reform process the IPA recognised the need for waterfront workers to be given improved training and a career path.

Traditional training on the waterfront involved extensive on-the-job experience. From the late 1940s onwards, traditional stevedoring methods were slowly replaced by mechanical methods. Initially, training was arranged on an industry basis because of the small numbers being trained. By the 1960s, the Australian Stevedoring Industry Authority was operating training schools on a regular basis in a number of ports to ensure that the labour force was adequately trained (ISC 1988a, p.471).

This policy of industry training continued until the WIRA process began. In 1989, AEWL provided courses through the National Waterfront Training Centre in Melbourne or Area Training Officers in other ports. Courses were provided on an 'as required' basis, but training became fragmented and refresher courses suffered (ISC 1988a, p.472).

As EAs were introduced, each company became responsible for training its workforce. The Stevedoring Industry Award 1991 stated (WWF 1992, p.70) that

> an employer shall develop a training program consistent with:
>
> - the current and future skill needs of the enterprise;
> - the size, structure and nature of the operations of the enterprise;
> - the requirement to implement the new classification structure in the enterprise and the ongoing operation of the classification structure; and
> - standards established by the National Training Advisory Council.

The National Training Advisory Council (NTAC) was established to oversee training arrangements at the industry and enterprise level. Its functions were:

- to develop national training competency, accreditation and certification standards that will apply at both the enterprise and industry level; and
- to develop industry training programs which will be available also for use by enterprises as they are required.

By the time WIRA ceased operating, NTAC had developed competency standards for operational, supervisory, clerical and security functions in the stevedoring industry. The National Training Board (NTB) endorsed the standards in 1992 on the condition that they be reviewed in 1994. This was to ensure that the standards would be further developed from a less 'equipment or task-based approach' to one that focused more on the application of skills and knowledge (Mulhall 1994).

The major issues that currently impact upon the implementation of training reform in waterfront enterprises include:

- the National Stevedoring Australian Vocational Certificate (NSAVC) Pilot Project, funded by the Department of Employment, Education and Training (DEET), which is developing a training path for entry into the stevedoring trade;

- the Government requirement that training programs and trainers will need to be accredited and registered to be classified as recognised training providers;
- the possibility, with the rationalisation of the National Training Advisory Bodies by the Australian National Training Authority (ANTA), that the stevedoring industry training will be amalgamated with the maritime training (Mulhall 1994, p.5).

**Australian Vocational Certificate**

The NSAVC Pilot Project is a tripartite agreement. Presently the project is being funded by DEET for $490 000 for two years up to August 1995, with an objective of getting 200 trainees started over a two-year period.

The NSAVC system provides a flexible training system, which is not based on time served indentures as was the old apprentice system, but rather a trainee has to achieve specified levels of competency. The levels of competency and the contents of the courses studied will be controlled by the industry through a national steering committee.

However, the employer of the trainee will determine the majority of subjects a trainee will study.[10] This ensures that the employer gets a person with the skills they need and can use. Skills gained during training will be fully accredited nationally. Core subjects in level 1 are relevant to industries other than stevedoring. Similarly, relevant skills gained in other industries will also be recognised by the stevedoring industry.

Under the scheme, trainees at the end of their training are not guaranteed a job. Instead, upon completion of training they will have to find their own employment. They could become permanent employees if positions are available. However, initially they will probably find employment as guaranteed wage employees or as casuals, and over time, as they prove

---

10. Training consists of 280 hours per level with 3 levels equating to 840 hours. Each level consists of about 7 units totalling approximately 280 hours. Of these, only 160 hours for 5 units are compulsory in level 1, and the remaining units in level 1 and higher levels are selected by the employer to best meet their company's requirements. At present there are 19 elective subjects at level 1 and 31 elective subjects at levels 2. Level 2 NSAVC is equivalent to waterfront level 2. Level 3 training subjects have yet to be determined, but Level 3 NSAVC is equivalent to waterfront level 4.

their worth, gain permanent employment. The MUA is supportive of casuals entering the industry by this means.

Employers will recruit their own trainees and the number of trainees employed is determined by the employer. Trainees can be employed in two ways:

- part-time TAFE plus part-time work; or
- full-time work including study.

Levels of pay for trainees are based on the level of education of the trainee and the number of days a trainee actually works. Rates vary from 50 per cent to 85 per cent of the award pay level.

The MUA hopes that all of the 200 NSAVC trainee positions in the pilot project will be filled by September 1995, when the scheme should be fully operational. By February 1995, 160 trainees were employed, this figure suggesting that the target of 200 will be achieved. Levels of training may be extended to include all levels of stevedoring labour.

**Company training**

Companies currently use three sources of training:

- in-house resources,
- consultants, and
- equipment manufacturers.

At the completion of the WIRA process, companies were providing courses in the skills needed within each classification level. These were:

- induction to waterfront,
- stevedoring and technical operations,
- clerical,
- interpersonal skills, and
- management.

Companies are now providing a higher level of training than that provided prior to the WIRA process (table 2.6), although the amount of

**TABLE 2.6 LEVELS OF TRAINING, 1988–89 TO 1993**

| *Time* | *Per cent of employees who attended training* | *Training person-days per person trained* | *Training person-days per employee* |
|---|---|---|---|
| 1988–89[a] | 12.5 | 4.09 | 0.51 |
| 1989–90[a] | 14.5 | 8.11 | 1.18 |
| 1993[b] | 67.4 | 3.67 | 2.47 |

a. Courses within these years were offered by AEWL.

b. These figures are an underestimate as not all stevedoring companies supplied the information and some excluded in-house training.

*Sources* AEWL (1989a, 1990e); personal communications from stevedoring companies.

training per employee attending is less. Except for the very basic areas of training from levels 1 to 2, most companies are currently concentrating on multi-skilling across classifications, and not so much on moving workers up the classification levels. This emphasis is more to do with company priorities than ensuring all workers are given the opportunity to be become multi-skilled within their level. Once this is complete, proper career path training is more likely to occur.

## SAFETY

Normally, without any other change in work procedures or equipment used, an increase in productivity can result in an increase in the risk of accidents and damage to goods (Martin 1991). One of WIRA's functions was to arrange the release of Commonwealth funds for approved programs studying safety issues. Up to $100 000 was allocated to the programs (WIRA 1989, pp.3,22).

In discussions, stevedoring companies claimed that the WIRA process had not compromised safety and that, if anything, safety had improved. Data collected on safety, which were provided by the companies, corroborate this view (see table 2.7). There has been a threefold improvement in safety, and a 56 per cent improvement in productivity (BTCE 1994, p. 7).

**TABLE 2.7 ACCIDENT RECORD OF STEVEDORES SINCE THE PRE-WIRA PERIOD**

| Period | Person-hours lost through accidents | Person-days lost per 100 employees | Per cent of person-hours lost per employee |
|---|---|---|---|
| 1988 | 85 041 | 202 | 3.0 |
| 1989 | 80 010 | 1 202 | 2.7 |
| 1993[a] | 9 347 | 246 | 0.9 |

a. Estimate based on data provided by part of the industry.

*Sources* AEWL (1989a, 1990e); personal communications from stevedoring companies.

## MAINTENANCE

The In-Principle Agreement stated that the EAs were to include training and multi-skilling in preventative maintenance, breakdown and major repair or refurbishment work (WIRA 1989, p.14).

In discussions, stevedores indicated that the operational efficiency of their equipment has not changed. All companies were found to use regular planned maintenance schedules to minimise the number of breakdowns. Unexpected breakdowns are reported by companies to be rare (stevedores, pers. comm.).

As noted earlier, multi-skilling of maintenance skills with other types of work does not appear to be occurring. However, multi-skilling has allowed operational staff to carry out some minor maintenance. The MUA trainee scheme also allows for this type of multi-skilling.

Use of contractors to carry out maintenance was reported to be increasing, especially in minor ports where there is insufficient work to warrant full-time maintenance staff (stevedoring companies, pers. comm.). However, the MUA is generally not in favour of contracting out maintenance work and is willing to take industrial action to protect its members in the major ports (Davis 1994).

## INDUSTRIAL DISPUTES

One of the objectives of the WIRA process was to reduce the number and the effect of industrial disputes by introducing several changes to the industry. Although the level of industrial disputes for the year ended December 1993 was similar to the pre-WIRA period (see figure 2.3), the impact on the users was considerably less. The major changes to bring about this effect were to:

- reduce the number of unions and awards, thereby reducing the scope for demarcation disputes, and hence reduce the number of many smaller disputes which can cause considerable disruption to cargo movements;
- bring in multi-skilling to eliminate sources of likely demarcation disputes; and
- develop procedures to allow for quick and early settlement of disputes.

As discussed above, the number of unions and awards was reduced rapidly as a result of the WIRA process. Previously there were eight unions and 21 different awards. There are now only three unions and

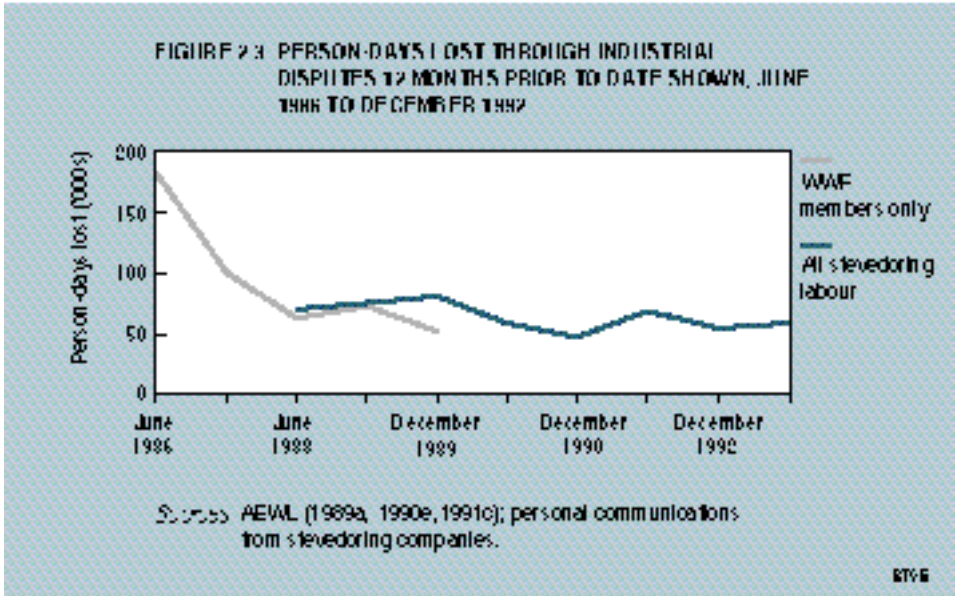



FIGURE 2.3 PERSON-DAYS LOST THROUGH INDUSTRIAL DISPUTES 12 MONTHS PRIOR TO DATE SHOWN, JUNE 1986 TO DECEMBER 1992

Sources AEWL (1989a, 1990e, 1991c); personal communications from stevedoring companies.

one award covering the stevedoring industry. Demarcation disputes have all but disappeared and are only occurring to a minor degree between MUA members and their supervisors (AMOU members). The amalgamation of unions has occurred throughout the industry, with many smaller ports, bulk terminals and depots now only having one union involved. In the larger operations two and possibly three unions are still involved.

Figure 2.3 shows the amount of time (person-days) lost due to unauthorised stoppages. The data show that the total time lost by industrial disputes for the industry is now lower (person-days lost) than in the pre-WIRA period, but on the basis of person days lost per employee there has been little change. Furthermore, the most recent data (in figure 2.4) suggest a rising trend in time lost through unauthorised stoppages.

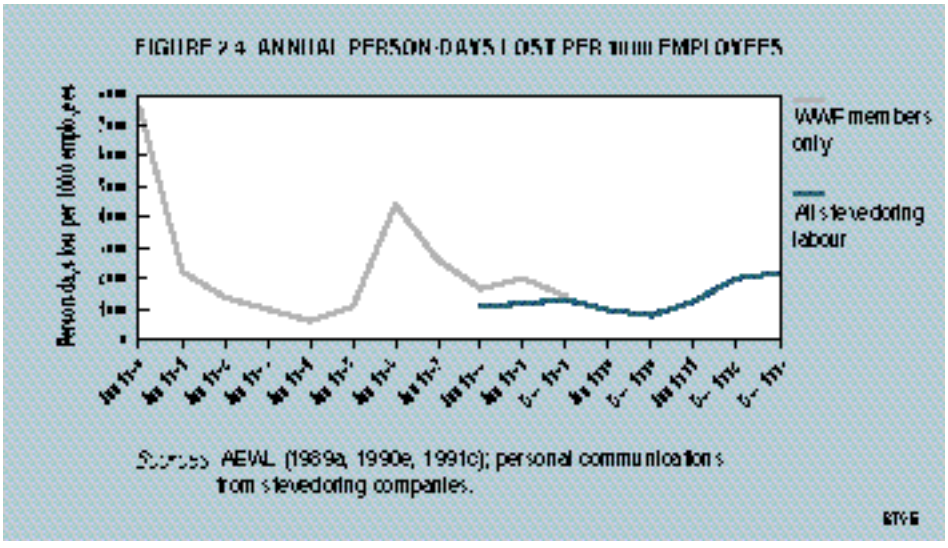
The effect of industrial disputes on shipping, though, is now less significant than it was before the WIRA process. Previously each of the several unions on the waterfront tended to act independently, with each causing a separate dispute and delay to shippers. Now, with one main waterfront union, most workers take industrial action at the same time, and although a similar number of person-days are lost, the dispute is more concentrated over a shorter period, thus avoiding ship delays through rolling strikes. Also, where only one company has been affected, other companies have been able to stevedore ships normally handled by the affected company. This is indicated in figure 2.5, which shows a substantial reduction in average ship delays due to unauthorised stoppages, at least up to the first half of 1992.

## DEPOTS

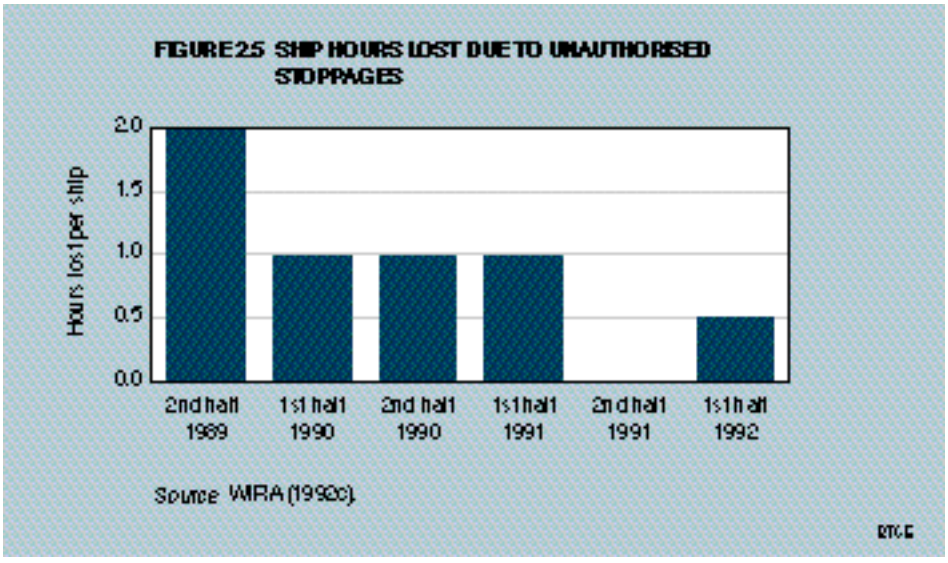
At the beginning of the WIRA process, most depots employed WWF labour. At the time, the WWF and Storemen and Packers' Union (SPU) were in dispute as to which union should cover the labour force of depots at the waterfront. At the end of the WIRA process, the matter was still unresolved. The WWF (now MUA) had won the original case, but the SPU was appealing against the decision.

However, the whole question of coverage became irrelevant. At about the same time as the WIRA process, the Australian Customs Service relaxed the rules on requirements of who could register to run depots (section 17b *Customs Act 1901*). The change meant that depots no longer needed to be in the wharf area, but could be up to 15 minutes car journey from a wharf.

The effect of this change was that, since depots outside the wharf area did not need to employ MUA workers, depot employers could use other labour awards which were not as expensive. Following the changes to the *Customs Act 1901*, the number of MUA depots has dropped from 17




Source: AEVL (1989a, 1990e, 1991c); personal communications from stevedoring companies.



(BTCE 1988) to three, while numerous non-MUA depots (literally hundreds: Australian Customs Service, pers. comm.) have opened up away from the waterfront.

The three MUA depots which still remain have had to institute major changes in labour procedures. The companies had to change just to survive. These changes had to occur irrespective of what happened under the WIRA process. Their present EAs and work practices bear little resemblance to the practices and award conditions of the pre-WIRA depot era.

## BULK TERMINALS

Because most bulk terminals did not employ traditional waterside labour, they were not involved in the WIRA process. In those bulk terminals which were involved in the process, as in other stevedoring areas, the number of unions has been reduced to three or less. Similarly, the number of stevedoring employees also dropped significantly and the effect on labour productivity has been dramatic (see chapter 3).

Despite the reduction in labour force numbers, institutional boundaries which can cause demarcation disputes still exist. The problem does not lie entirely with unions but rather with the number of institutional entities involved in a single stevedoring operation. At present, to load a single bulk shipment, up to three different bodies, each with its own labour force, are involved. These bodies often have labour which is represented by different unions, such as MUA, Australian Workers' Union and Transport Workers' Union.

For example, in South Australia loading grain involves three bodies:

- the grain elevator board, which controls the stockpiles, weighing and sampling of grain;
- the port authority, which maintains and controls the conveyor and grain chutes or loaders; and
- the stevedoring company, which manages the stowage of the grain on the ship.

In Newcastle the first two tasks are managed by the terminal operator, which also won the contract to supply the stevedoring labour (but uses a supervisor supplied by a stevedoring company).

From discussions with terminal operators, the BTCE found that multiplicity of control of bulk operations is not uncommon. Although the various bodies may be efficient, they do add extra layers of control, and create internal boundaries within the terminal which provide a catalyst around which industrial disputes may occur. Also, such boundaries restrict multi-skilling opportunities between the various entities' labour forces.

## INTEGRATED PORT LABOUR FORCE

In Darwin, Burnie, Geelong and regional ports in Western Australia, a different approach to labour reform was taken. In addition to the reforms discussed above, the labour forces of the stevedores and port authorities were combined into one organisation, with multi-skilling occurring right across both areas.

The reason for this approach was that the removal of the cross-subsidisation of idle time and standby payments between ports, and the very seasonal use of the minor ports, meant that costs of maintaining and running these ports were becoming prohibitive. The closure of some of these ports was a real possibility.

Integrated port labour forces are now employed in Albany, Broome, Bunbury, Burnie, Darwin, Esperance, Geelong, Geraldton and Wyndham. In the fully integrated ports in WA, the port authority employs all of the permanent labour for stevedoring and port operations. The stevedoring companies subcontract labour from the port authority as required.

In the partially integrated ports of Burnie, Geelong and Darwin, the port and some stevedoring labour are combined but in addition stevedoring companies still employ their own permanent labour.

The job classification systems for integrated port labour forces have developed differently in each location. The Western Australian model is shown in table 2.8. The skills for integrated labour include several additional work areas covering port operations. At this stage the pilot and tug labour forces are not integrated. Note the differences between the SIA (table 2.3) and the IPLF in work skill areas, and in the number of levels of workers.

In Burnie, Tasmania the IPLF classifications are quite different, with four classification structures in place: duty officers, stevedoring labour, port labour, and clerical and administrative employees. Duty officers operate

the radio and security services. The stevedore and clerical classifications are the same as those identified in the Western Australian integrated labour ports. The port labour has 14 levels and includes specialist trade knowledge in electrical, mechanical and construction areas. Engineering specialists and training coordinators are among this group. The EA is covered by two awards, based on the Tasmanian *Industrial and Commercial Training Act 1985* and the Federal *Stevedoring Industry Acts (Termination) Act 1977*. Within the stevedoring classifications maintenance duties are spread across several levels. The port operators have maintenance duties concentrated at higher levels of the tradesperson and engineering levels. In terms of multi-skilling many clerical workers have been trained to perform operational work, but relatively few operational workers have been trained in clerical functions. Port operators become involved in clerical / administrative duties at level clerical 4 when inventory and store control are introduced. For employees to proceed to port levels 6 and above they need to obtain an Advanced Certificate or an Associate Diploma. There are set wage and appropriate allowances for each classification level. Each group, irrespective of the work it is doing, receives its base pay as per the EA. Other conditions, however, are dependent on the work a person is doing: for stevedoring activities SIA conditions apply, but for all other activities *Industrial and Commercial Training Act* (1985) conditions apply.

Integration in Darwin and Geelong is to a lesser extent than in the other integrated ports. In these ports stevedores employ their own permanent stevedoring labour. At times of high demand for stevedoring labour, the stevedores first hire additional labour from the port authority before using their own casual labour. Port authority labour performing stevedoring tasks are paid at rates according to the SIA. At low demand for stevedoring labour the reverse labour flow does not occur. Stevedoring labour is not available for port work since the MUA would not agree to conditions which were less than those of the SIA.

The advantage of the integrated ports systems is that the labour force can be used for port operational tasks when not stevedoring and vice versa (other than in Darwin and Geelong). A more efficient allocation of labour resources occurs. By combining the two labour forces, the overall workforce was reduced by 30 to 50 per cent and idle time was virtually eliminated.[11]

---

11. Labour costs did not reduce by the same proportion in the WA ports, because all labour now belongs to the MUA with its higher award payments. Nevertheless, the reduction in labour costs was still 20 to 40 per cent.

**TABLE 2.8 WESTERN AUSTRALIAN INTEGRATED PORT LABOUR JOB CLASSIFICATION LEVELS**

| *Level* | *Clerical and administrative* | *Operational* |
|---|---|---|
| 1 | Induction and initial training | Induction and initial training |
| 2 | Basic clerical functions, including basic office procedures, office machinery, information and filing systems, and keyboard skills | Basic stevedoring tasks, mooring, basic port maintenance and construction, basic equipment servicing and basic clerical tasks |
| 3 | Routine clerical duties; or clerical administrative functions | General stevedoring tasks (medium equipment, operate ship gear and basic servicing); or port maintenance and construction; or deckhand work; or semi-skilled engineering maintenance of equipment and vehicles and able to use hand tools; or first aid duties; or security watchman |
| 4 | Clerical duties requiring initiative; or administrative duties | Complex stevedoring (heavy equipment and more specialised ship's gear); or maintenance trade person; or launch master |
| 5 | Supervise clerical; or administrative duties requiring initiative | Foremen operational tasks |
| 6 | Administrative duties which require initiative, discretion and judgment | Supervises port maintenance and stevedoring operations; or maintenance trade person special class |
| 7 | Administrative duties requiring supervisory and special skills | Plans, controls, coordinates stevedoring, construction and maintenance operations |
| 8 | Supervises general office administration, or responsible for financial analysis | Provides technical, administrative and operational support to senior management |
| 9 | Plans, implements, monitors and evaluates port projects and programs | |

*Source* EA (1992).

The IPLF ports are now reporting little or no idle time, while stevedores in regional ports elsewhere in Australia are reporting idle time running from 20 to 90 per cent.

The integrated employment arrangement appears to have generated significant benefits. However, discussions with port authorities and stevedores elsewhere indicate there is a high resistance to integrating other ports, especially using the Western Australian model. The major concern expressed by the port authorities is that if integrated port labour is introduced, the cost of labour for port operations will increase because of a flow-on of better wages and conditions currently enjoyed by the stevedoring labour force. At present stevedores on ordinary pay receive approximately $35 per week more than port authority workers, and overtime loadings are much more generous.

In Burnie such a flow-on has not occurred. Workers while working as stevedores enjoy conditions similar to the SIA, but when working on port facilities (or at the airport) enjoy working conditions as set out in the State award. However, in WA such a flow-on did occur. Western Australian port authorities note that, although hourly rates are up, port costs have gone down considerably (see chapter 3) due to reduced idle time and overtime.

Overall the IPLF approach appears to be effective in reducing idle time and labour costs, and regional ports elsewhere in Australia could well benefit by adopting variations of the IPLF system to suit their own local conditions. The BTCE estimates that if other ports adopted such an approach the total labour costs of the industry could be reduced by at least 5 per cent, with similar savings occurring with reductions in labour costs for port authority functions.

## CONCLUSION

Overall, in terms of labour reform, the Federal Government's waterfront reform program has provided a positive improvement in productivity (to be discussed in chapter 3), attitude, conditions and safety. However, the results vary both from port to port and from company to company.

The effects of many of the changes are still only partially felt, and in some instances it may take some time before the benefits are fully realised. For example, with multi-skilling, management and workers are still learning of the opportunities and the potential benefits that multi-skilling can offer, and the process will probably go on for some

years, as old prejudices and barriers are dissolved. The current, and subsequent, rounds of EA negotiations should bring about further change, making the industry more dynamic and competitive.

Reform of labour arrangements on the waterfront has had to overcome a long history of mistrust. The long memories and hardened attitudes have been difficult barriers to dismantle. Although reform has come a long way, it is not surprising that remnants of mistrust still linger. Both employers and employees need to work at attitudinal change to cooperatively develop solutions to remaining problems and future ones that will emerge.

On the positive side the WIRA process has:

- encouraged some companies and their workers to develop a company ethos, but in other instances it is still very weak, particularly in the major ports;
- facilitated the development of more flexible labour arrangements in the second round of EAs in late 1994 and early 1995 through the introduction of guaranteed wage employees and the establishment of a new casual list;
- met the aim of introducing enterprise agreements;
- facilitated the acceptance by workers, especially in many minor ports, depots and bulk terminals, that compulsory redundancy as a last resort might be necessary;
- provided a smaller (down 57 per cent) and younger (10 years younger) workforce;
- allowed the workforce to be deployed much more efficiently as a result of multi-skilling and multi-tasking, particularly in bulk terminals;
- allowed better allocation of tasks and labour on an 'as needs' basis;
- provided an employment structure that allows career development for workers within the industry;
- brought about a more flexible and dynamic training system, which has the potential to meet the demands of the industry and the companies within it;
- produced safer work environments;

- allowed companies in smaller ports to use contract maintenance staff, but has made little change in larger ports;
- reduced the number of unions involved in stevedoring from eight to three, with some smaller ports, bulk terminals and depots having only one union involved;
- introduced an industry-wide award, replacing 21 different awards;
- reduced idle time by 50 per cent from 26 per cent (June 91) to 13 per cent (December 1993); and
- allowed the integration of port and stevedoring labour forces to occur in regional ports in Western Australia and Tasmania and to a lesser extent in Geelong and Darwin (integrated port labour forces), producing large savings in costs and reductions in idle time in both areas.

On the negative side:

- retrenchment of surplus labour in the ports of Sydney and Melbourne, and in some minor ports elsewhere, is more difficult than envisaged in the IPA;
- although the present age structure has improved, with the median age shifting from 50 plus to 40- to 50-year-olds, the situation could easily return to 50 plus in just over a decade, with over 50 per cent of the workforce due for retirement (at 65) in 15 to 25 years;
- in some ports idle time is still too high and use of casual (supplementary) labour is too low;
- the present generous shift and overtime allowances greatly reduce the effectiveness of present incentive schemes; and
- although the impact of strikes on ship delays is not as great, time lost through industrial disputes per employee is just as high as in pre-WIRA times.

The second round of EA negotiations has demonstrated that within the EA framework it is possible to develop solutions to labour problems. Development of greater trust between the MUA and stevedores over time should see the EA process develop further benefits.

# CHAPTER 3 EFFICIENCY, PRODUCTIVITY AND RELIABILITY

Key indicators of waterfront reform achievements are the efficiency with which the factors of production are used (as reflected in various measures of productivity), and the reliability of the services provided to waterfront users. Large reductions in the labour force imply that labour productivity has improved substantially. New labour arrangements were designed to be more flexible than those in place prior to the reforms, and were intended to allow the waterfront to respond faster to changed demand patterns, and so enhance waterfront reliability. This chapter looks at the impact on Australian waterfront performance, in terms of productivity and reliability, of these new arrangements.

## CONCEPTS OF EFFICIENCY, PRODUCTIVITY AND RELIABILITY

Improvement of waterfront efficiency has been one of the most discussed areas of microeconomic reform. There are various concepts of efficiency, which while useful for discussing the effects of changes on the waterfront, can be very difficult, if not impossible, to measure directly.

Efficiency improvements may be gauged by considering changes in more directly measurable parameters, such as productivity or reliability. However, before an examination of the empirical evidence for improvements in these parameters, the various concepts of efficiency, and their relationship to productivity and reliability, will be briefly discussed.

### Efficiency

The term ‘efficiency’ has been widely, often loosely, used with reference to the Australian waterfront, but greater precision is required in an

evaluation of the reforms. Concepts of efficiency relevant to the consideration of waterfront reforms include economic efficiency, technical efficiency, and X-efficiency.

### *Economic efficiency*

Economic efficiency is concerned with the optimum allocation of resources, and is related to the concept of opportunity cost. Such a cost arises if resources used in one area could be more productive if employed in another area.

Economic (or allocative) efficiency is achieved if sufficient resources are allocated to meet users' demands at prices related to marginal costs. The pricing of stevedoring services is discussed in chapter 4.

### *Technical efficiency*

Technical (or productive) efficiency is a function of the production method employed. It is measured in terms of output per unit of capital or output per worker (Terry, Jones & Braddock 1988, p.175). One method is more technically efficient than another if, for any given level of inputs of capital and labour, it produces more output. It was hoped that waterfront reform would make the workforce more technically efficient. However, technical efficiency, while a prerequisite for economic efficiency, does not ensure economic efficiency.

Achieving maximum technical efficiency requires firms to adopt those production techniques which maximise the output from the resources employed. One way in which firms may seek to increase the output per worker is through the adoption of better work practices.

Technical inefficiency may arise from the way an industry or firm is structured, if this structure prevents the adoption of output-maximising production techniques. It may arise, for instance, due to demarcation disputes, or for a variety of other reasons, such as the inability to work overtime, or to work with less than the usual number of employees. Some of these causes may be remedied as firms adopt enterprise bargaining.

### *X-efficiency*

X-efficiency is a term, originating with Liebenstein (1966), which encompasses all the non-technical factors which impinge on the non-allocative efficiency of firms. Where X-inefficiency exists, a firm's level of technical efficiency will be lower than is possible with the production methods it uses.

The firm will be operating below its production possibility frontier,[1] and factor inputs can be better utilised to increase the production of some good, for given amounts of factor inputs of labour and capital, without reducing the production of any other good (Bos 1989). For example, X-inefficiency may exist because equipment is under-used due to lack of demand for the product.

However, the main cause of X-inefficiency is the 'existence of areas of inertia in individual decisions regarding the supply of labour effort' (Bos 1989, p.70). Individuals may choose levels of effort which maximise their utilities (levels of satisfaction), but which may be less than the levels that maximise the firm's profits. Bos states that, with the recruitment of employees who are expected to meet the full requirements of their job, production will approach or obtain a point on the production possibility function.

If X-inefficiencies did indeed exist on the waterfront, then the labour force could be reduced without any reduction in throughput.

According to the ISC (1988c, p.431) X-efficiency exists for mainly two reasons:

> ... the divergence of objectives between the owners of a firm and its managers, and the market power held by the firm. In summary, the incentive to be efficient will be greater

---

1. On the production possibility frontier, the given amounts of factor inputs (that is, labour and capital) cannot be changed so as to increase the production of some good without reducing the production of any other good.

   The ISC (1988c, p.430) pointed out: 'Most economic analysis of company behaviour assumes that production is carried out at the "production frontier": that is, the output being achieved is the highest that can be achieved with the inputs at present being used. This follows from the notion of profit-maximisation as the force that drives companies: the more efficient a company is the more it can make. The drive to improve efficiency therefore continues with equal intensity irrespective of the current profit position of the company.'

> if those bearing the pain and making the effort also receive the profits; and the threat of extinction (or joblessness) is a more powerful motivator than making an additional dollar.

Industry employment arrangements would have been a major contributory factor. Such arrangements separated the efforts of the labour force from the fortunes of the employer. X-inefficiency also relates to inflexibility of labour arrangements on the Australian waterfront. These aspects were examined in chapter 2.

## Productivity

The term 'productivity' has been used continually throughout the waterfront reform process.[2] As with other terms, the term 'productivity' is often used by the media, and others, interchangeably with 'efficiency', without either being defined.

Productivity may be defined as the ratio of a measure of the output to a measure of one or more of the inputs to the production process (Devine et al. 1976). Productivity can thus be interpreted as a measure of technical efficiency.

Where there are multiple inputs to the production process, only total factor productivity[3] can give a true measure of changes in the technical efficiency of the production process as a whole. Measurement of total factor productivity is data-intensive, however, and the data required for the stevedoring industry are not readily available.

Although not ideal, partial productivity measures are employed in this analysis. Specifically, measures of changes in labour productivity and in container crane productivity are examined. These partial measures of productivity should, however, give a reasonable indication of the changes in the efficiency of the Australian waterfront, given that the

---

2. The term, though, is rarely defined by those using it, which can undoubtedly cause problems. Is it the productivity of the industry as a whole, or simply a section of the industry? These are important questions, because they may determine such things as wage increases or incentives to invest in capital equipment.
3. 'Total Factor Productivity is an index of aggregate output divided by an index of aggregate inputs. The outputs (services) are aggregated using revenue shares as weights. The inputs are aggregated using costings as weights.' (Salerian 1993, p.5).

changes in labour inputs during the WIRA process have been so great (see chapter 2) compared with changes in the capital stock employed.

## Reliability

The term 'reliability' is frequently used when the term 'delay' is meant.[4] Although delays are often associated with poor quality of service, a uniform and predictable delay could be factored into logistics plans and cost structures, with little impact on users.

Unpredictable delays can cause unanticipated cost increases for users. Although not commonly expressed as a problem, it is conceivable that early arrivals of ships or cargo can also impose additional costs. That is, it is the unpredictable variation rather than just delays in performance which imposes unforeseen costs on users.

The concept of variation in performance is consistent with the quality of service desired by waterfront participants. For instance, ship operators are concerned with the ability to keep to schedules and avoid unforeseen delays.[5] Terminal operators are primarily concerned with variations in equipment performance, cargo processing and clearance procedures. Unreliable ship schedules also make it more difficult for terminal

---

4. Some of the measures used by WIRA include ship arrival and entry delays due to industrial disputes, and ship days lost due to disputes. However, 'these measures probably bear more on the timeliness with which services are provided while reliability is concerned more with the extent of the variations in these measures. In this sense, a reduction in the variability of performance about an average level provides an indication of improved reliability in the provision of waterfront services.' (BIE 1993, p.45). In its 1992 review of waterfront performance, the Department of Transport and Communications (DoTC 1992) gave similar measures of reliability. On the basis of these measures, substantial improvements to reliability, relative to past standards within Australia, have been made over the past few years.
5. It is possible to divide delays into two subgroups in regard to reliability. These are:
   *normal delay*—those variations in performance that users are prepared to incur and protect themselves against by measures such as holding higher inventories of goods or adopting longer lead times. A reduction of normal variation increases the quality of service of the waterfront.

   *unanticipated delays*—usually this type of variation is too expensive for port users to protect themselves against through high inventory levels, and may require costly responses such as using air freight or bypassing affected ports and using land transport (BTCE 1990, p.2).

   An example of an unanticipated variation is the dispute affecting AS in Sydney in February 1994. Unanticipated variations such as this dispute may also have long-term implications.

operators to plan the allocation of terminal facilities. Therefore, this paper takes the approach that reliability can be measured by the degree of variation between expected and actual levels of performance.

## CONTAINER STEVEDORING PERFORMANCE

At the most basic level, container stevedoring productivity can be measured in terms of containers handled per person-shift. Reduction in the size of the labour force was a prime focus of the reform process, implying that labour productivity should have increased substantially.

From the ship operators' perspective, stevedoring performance can be measured by how much time ships are required to be at a berth to complete cargo loading and discharge. The time the ship is at berth for cargo handling operations (elapsed time) depends on:

- the number of cranes used (crane intensity);
- how fast cranes can load or discharge containers from a ship (crane rate); and
- the time during which cargo is actually loaded or discharged from the ship while it is ready for cargo handling operations (net time).

Appendix IV contains a discussion of changes in crane rates and crane intensities, together with a table showing time series of the various measures of stevedoring productivity.

### Labour productivity

As labour costs form from 55 to 75 per cent of stevedores' total costs of container terminal operation (PSA 1992b, p.7), labour productivity is a key measure of the improvement in Australian waterfront performance.

The best indicator of the average labour productivity of the workforce engaged in stevedoring is the average number of teus handled per person-shift. Time series for teus per person-shift in the major ports are available for the WIRA period, but thereafter these data are lacking.

Average teus handled per person-shift in the five major ports increased by 57 per cent over the WIRA period (see table 3.1 and figure 3.1).

However, the increase did not take place until late 1991, when the big reductions in the stevedoring labour force took place.

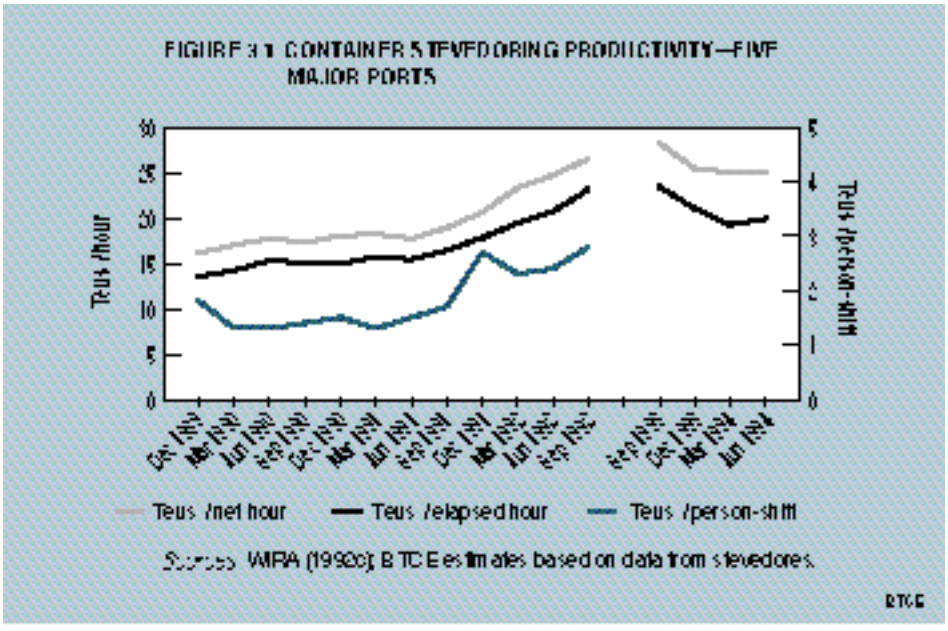



**TABLE 3.1 LABOUR PRODUCTIVITY**

*(teus / person-shift)*

| *Port* | *Dec 89* | *Sept 92* | *% increase* | *Peak rate* | *When peaked*[a] |
|---|---|---|---|---|---|
| Melbourne | 1.12 | 3.42 | 205 | 3.42 | Sept 92 |
| Sydney | 2.66 | 2.38 | –11 | 2.41 | Dec 91 |
| Brisbane | 1.98 | 2.77 | 40 | 2.77 | Sept 92 |
| Adelaide | 1.70 | 2.96 | 74 | 2.96 | Sept 92 |
| Fremantle | 2.59 | 3.16 | 22 | 3.82 | Mar 92 |
| 5 major ports | 1.81 | 2.84 | 57 | 2.84 | Sept 92 |

a. No data after September quarter 1992.

*Source* WIRA (1992c).

Sydney defied the five-port trend: based on WIRA data, teus per person-shift was slightly lower at the end of the WIRA period than at the start (figure 3.3). Sydney ranked highest of the five major ports in terms of teus per person-shift at the start of the WIRA period, but had fallen back to be ranked last by the September quarter 1992. This would appear to indicate that at the end of the WIRA period Sydney terminals were overmanned compared with those in the other major Australian ports.

Melbourne, by contrast, trebled its teus handled per person-shift over the WIRA period (see figure 3.2), to be almost 44 per cent higher than Sydney at the end of the WIRA period. Melbourne then ranked first on teus per person-shift, after ranking last at the start of the period.

## Ship working rates

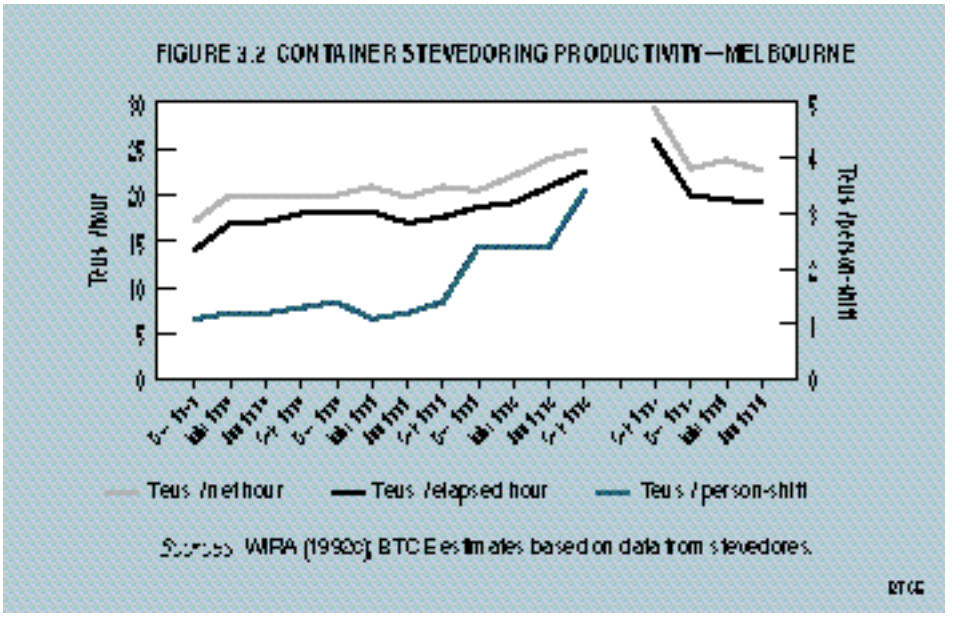
The rate at which ships are being worked is best gauged by the net handling rate. This measures the rate at which containers are transferred to or from the ship per hour, using one or more cranes per net hour.[6] It will thus be a function of both crane productivity and crane intensity. Table 3.2 shows net ship working rates for the five major ports.

On average, net rate productivity in the five major ports during the WIRA period remained flat until mid-1991 (see figure 3.1). This appears to have been due to the nature of the initial reform process, as participants negotiated and implemented new work practices and conditions contained in enterprise agreements (EAs). For instance, WIRA approved the EA of National Terminals (Australia) Limited on 3 March 1991 and that of Container Terminals Australia Limited on 30 July 1991.

From mid-1991 average net rate productivity for the five major ports improved steadily, to be 64 per cent higher at the end of the WIRA period than at the end of 1989. However, June quarter 1994 data (see figure 3.1) showed average net rates slightly lower than at the end of the WIRA period. This was due mainly to the decline in the performance of Melbourne in the latter half of 1993, but after the September quarter of 1993, a deterioration in net rate performance also occurred in Brisbane.

---

6. Net time = the total time the ship is alongside the berth offering for work from labour first on to last labour ashore minus the time ship is unable to work due to ship's fault, weather, awaiting cargo, industrial disputes, closed holidays, shifts not worked at ship operator's request and award shift breaks.




Sydney's steep increase in net rate productivity from mid-1991 to mid-1992 (see figure 3.3) is perhaps the outstanding feature of the improvements in productivity during the WIRA period. In the December quarter 1989 the net rate performance of Sydney terminals was below that of Melbourne, but by the September quarter 1992 Sydney had

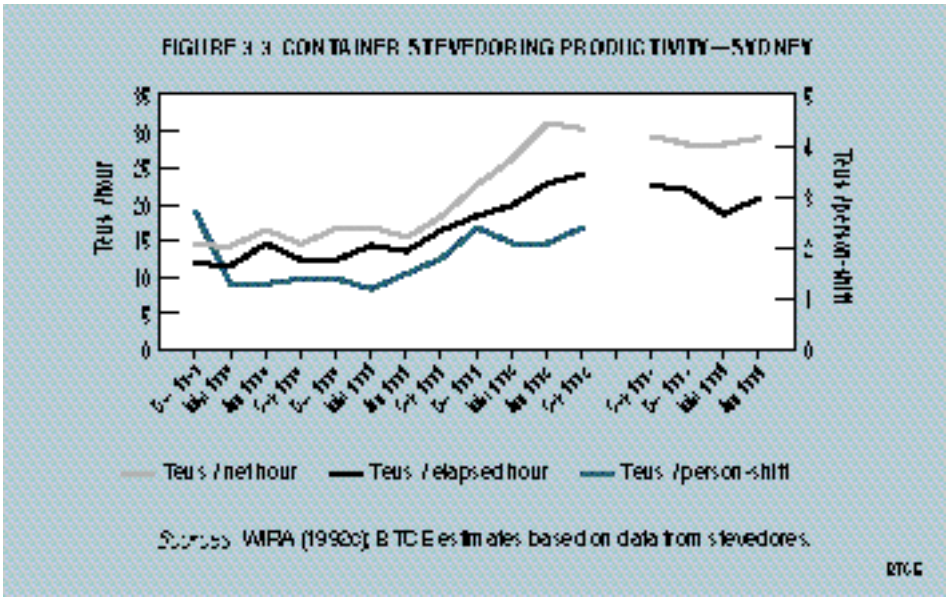
**TABLE 3.2 SHIP WORKING RATE**

*(teus / net hour)*

| *Port* | *Dec 89* | *June 94* | *% increase* | *Peak rate* | *When peaked*[a] |
|---|---|---|---|---|---|
| Melbourne | 17.2 | 22.7 | 32 | 29.3 | Sept 93 |
| Sydney | 14.4 | 29.1 | 102 | 31.2 | Jun 92 |
| Brisbane | 19.0 | 25.9 | 36 | 29.4 | Sept 93 |
| Adelaide | 19.3 | 25.7 | 33 | 29.8 | Mar 94 |
| Fremantle | 14.7 | 19.5 | 31 | 21.4 | Sept 92 |
| 5 major ports | 16.1 | 25.0 | 55 | 28.2 | Sept 93 |

a. No data for December 92, March 93 and June 93 quarters.

*Sources* WIRA (1992c); BTCE estimates based on data from stevedores.




overtaken Melbourne. Sydney's net rate productivity was then the highest of the five major ports, and it remained so in the June quarter 1994.

The substantial improvement in net rate ship working performance in Sydney over the WIRA period is in stark contrast to the situation with labour productivity. This suggests that, while ships were being worked with increasing speed, staffing levels must have remained high in Sydney, compared with other ports, especially Melbourne, until very late in the WIRA period (or thereafter).

During the WIRA process, Brisbane's net rate performance improved by 44 per cent, Adelaide's by 46 per cent, and Fremantle's by 46 per cent. The most recent data, for the June quarter 1994, point to net rate performances 5 to 10 per cent lower than at the end of the WIRA period for Brisbane, Adelaide and Fremantle (see table 3.2).

### Duration of stevedoring

Improvements in ship turnaround times due to stevedoring reform depend primarily on improvements in labour and crane productivity and in crane intensity, which reduce the time taken to exchange a given

number of teus. Ship turnaround times will also be influenced by improvements in the reliability of stevedoring performance, which have an indirect effect via the behaviour of vessel operators in the ordering of services such as tugs, unmooring and pilots.

From the viewpoint of the vessel operator, the improvement in stevedoring performance can be gauged by the elapsed time per teu handled.[7]

$$\text{elapsed rate} = \frac{\text{number of teus handled}}{\text{number of hours the ship is alongside offering for work}}$$

On an elapsed time basis, aggregated data for the five major ports show a 71 per cent increase in productivity over the WIRA period (see appendix table IV.1). However, the most recent data indicate that elapsed rates have fallen below those at the end of WIRA (see table 3.3 and figure 3.1).

The port of Melbourne experienced a significant decline in elapsed rate productivity in the latter half of 1993, with industrial action relating to State Government issues. By contrast, much of the deterioration in Sydney's performance came in early 1994, with the dispute affecting AS.

By the June quarter 1994, Sydney's elapsed time rate had fallen to be substantially lower than at the end of the WIRA period. The sharp drop in elapsed time ship working rates in the March quarter 1994, as a consequence of the dispute, is readily apparent in figure 3.3.

Figure 3.4 shows net and elapsed rates at Brisbane, which were consistently close during the WIRA period. This indicates that, overall, there is little difference between the times when vessels are available to be worked and when they actually are being worked.

Adelaide is the only one of the major ports which had an elapsed rate in the March quarter 1994 higher than at the end of the WIRA period, but in the June quarter the rate fell below this level. The small difference between net and elapsed rates (see figure 3.5) indicates that there is little stoppage time.

---

7. There is no difference between WIRA's and the BTCE treatment of elapsed time: the 'total time the ship is alongside the berth offering for work, whether worked or not, measured from labour first ordered to last labour ashore' (WIRA 1992c, p.15; BTCE 1994).

**TABLE 3.3 STEVEDORING DURATION**

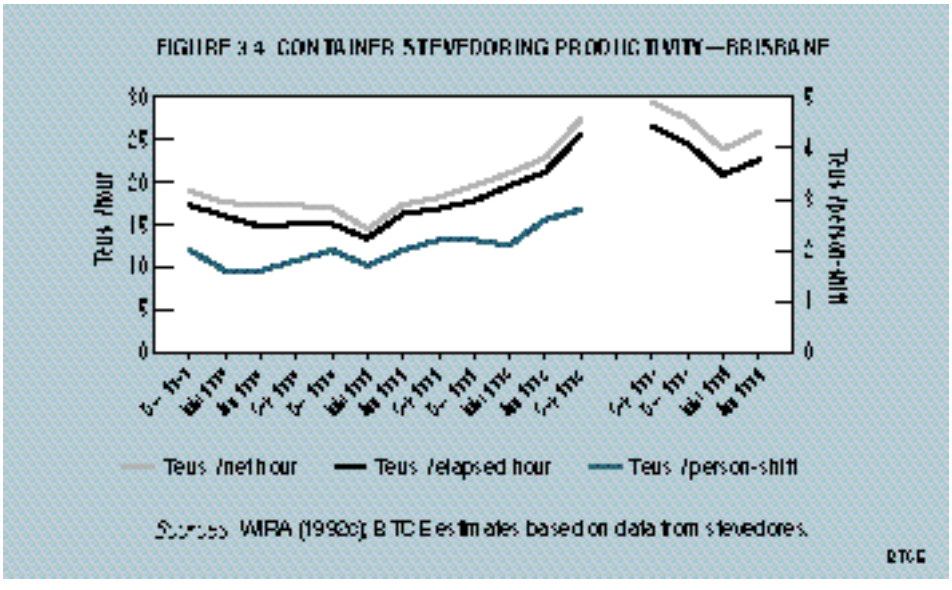
*(teus / elapsed hour)*

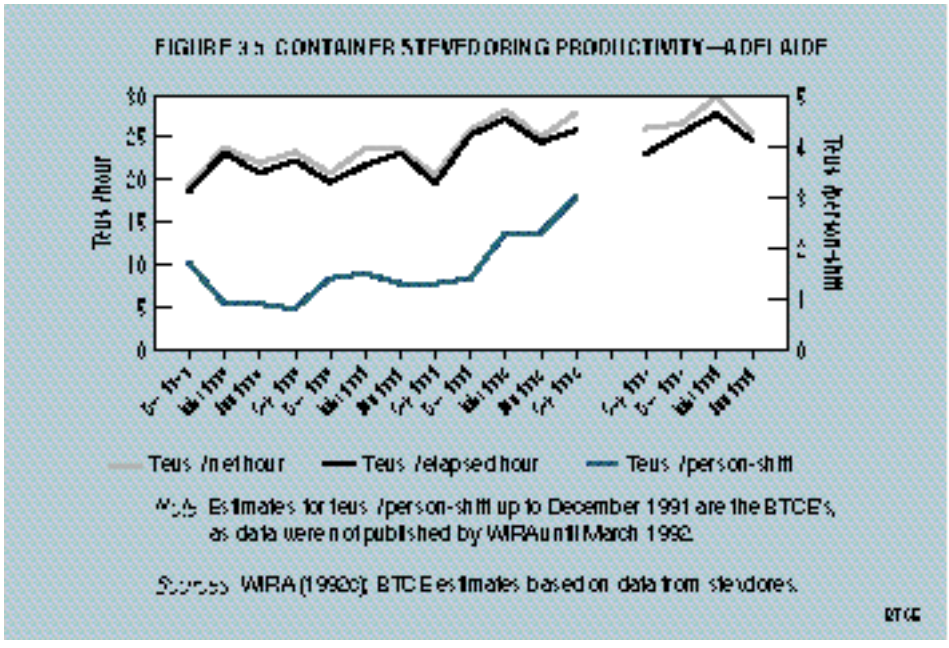
| *Port* | *Dec 89* | *June 94* | *% increase* | *Peak rate* | *When peaked*[a] |
|---|---|---|---|---|---|
| Melbourne | 14.1 | 19.2 | 36 | 25.9 | Sept 93 |
| Sydney | 11.9 | 20.8 | 75 | 24.1 | Sept 92 |
| Brisbane | 17.3 | 22.6 | 31 | 26.6 | Sept 93 |
| Adelaide | 18.7 | 24.7 | 32 | 27.8 | Mar 94 |
| Fremantle | 11.8 | 14.6 | 24 | 18.2 | Sept 92 |
| 5 major ports | 13.5 | 19.9 | 42 | 23.4 | Sept 93 |

a. No data for December 92, March 93 and June 93 quarters.

*Sources* WIRA (1992c); BTCE estimates based on data from stevedores.

As is evident by the large difference between Fremantle's net and elapsed rates (figure 3.6), ships seem to be spending considerable time alongside the berth without being worked. This suggests that when a third shift is required in Fremantle to complete the cargo exchange, the terminal operator may be forced by labour constraints to let the ship remain idle until labour is available on the following day, rather than work a third continuous shift.

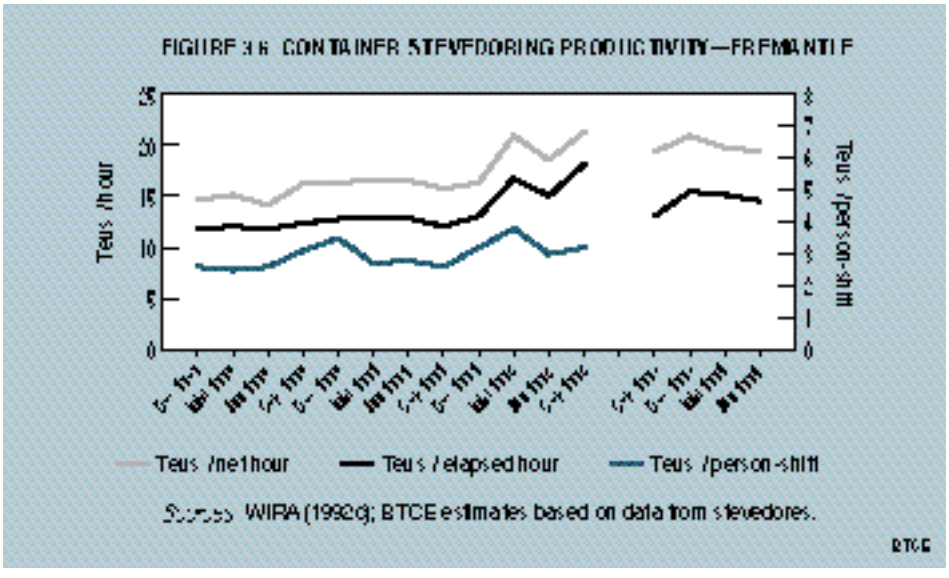





Note: Estimates for teus /person-shift up to December 1991 are the BTCE's, as data were not published by WIRA until March 1992.

Sources: WIRA (1992c); BTCE estimates based on data from stevedores.

BTCE




Sources: WIRA (1992c); BTCE estimates based on data from stevedores.

BTCE

It cannot be concluded that the decline in the post-WIRA elapsed rate for Melbourne, Sydney, Brisbane and Fremantle constitutes a continuing adverse trend. There were major 'one-off' factors influencing performance, both in Melbourne (industrial action in the December quarter 1993 relating to the Kennett State Government) and in Sydney (the dispute affecting AS in the March quarter 1994, which also affected other ports to some extent).

### *Reliability*

The measure of reliability, for the purposes of this discussion, is taken to be the extent to which container vessels can maintain their published schedules. Reliability is affected by variations in the duration of stevedoring. Due in part to waterfront reform, liner shipping is now able to offer a more reliable service than was available in 1988, prior to the WIRA process.

While on the Australian coast container and ro-ro ships lost on average 3.4 days in the June quarter and 4.5 days in the December quarter of 1988 (BTCE 1990). [8] However, by the second half of 1992, at the end of the WIRA period, container ships spent only 1.05 days on average longer than planned on the Australian coast (Carlson 1993), a reduction of about 75 per cent. A variety of factors could be responsible for this overall reduction in delays, including stevedoring reform, port authority reform and towage reform. Also, matters had improved somewhat even before the waterfront reform process was fully under way. 1988 was a particularly bad year for ship delays, a major contributor being the truck drivers' blockade of the port of Sydney in September 1988 (BTCE 1990). However, the WIRA process is likely to have been the major single factor in the improvement in reliability between 1988 and 1992.

A comparison of delays in 1990 and 1992 may give a better idea of the contribution of the waterfront reform process to vessel reliability. Data in Carlson (1993) show that container ships spent only 1.02 days longer than planned on the Australian coast in the second half of 1990, although the planned time on the Australian coast was one day longer in 1990

8. Although 1988 appeared to be a particularly bad year because of the blockade of the port of Sydney by truck drivers, average delays to ships in 1987 were almost as long as in 1988 (3.1 days in the second quarter and 4.5 in the fourth quarter of 1987).

than in 1992 on average. Had voyage planning[9] in 1990 been on the same basis as in 1992, delays would have been two days in the second half of 1990, which would have been halved by the second half of 1992, for a saving of one day. This saving may be attributed to the waterfront reform process.

## NON-CONTAINERISED GENERAL CARGO STEVEDORING

Table 3.4 shows the improvements in labour productivity in breakbulk stevedoring in the five major ports over the WIRA period. The WIRA data show that tonnes per person-shift almost doubled over the WIRA period for non-reefer cargoes, and increased by 70 per cent for reefer cargoes, averaged over the five major ports.

WIRA data also show substantial increases in ship working rate productivity for conventional ships between 1989 and the end of the WIRA process. Non-reefer cargo productivity per net hour increased by 83 per cent, averaged over the five major ports, between 1989 and the September quarter 1992. Refrigerated cargo appears to have had a very small drop in average productivity per net hour, aggregated across the five major ports, but this appears to be the result of switches between the ports used for reefer cargo.

On the basis of WIRA data, the BTCE estimated that if the cargo volumes of the major ports in the September quarter 1992 had been handled at 1989 productivity levels, it would have taken about 30 500 person-shifts. In fact, at the improved productivity levels then obtaining, less than 14 000 person-shifts were used, saving some 16 500 person-shifts or almost 54 per cent.

The effects on vessel turnaround times can be gauged by considering the increase in elapsed time which would have occurred had 1992 cargo volumes been handled with 1989 levels of productivity: an extra 19 hours

---

9. If the liner operator believes that reliability or port performance has improved then this is reflected in a reduction in scheduled days in port, with the converse being true if it is believed that reliability has decreased. 'The planned number of days in port are primarily based upon the liner operator's own experience as well as waterfront performance indicators and such factors as volume of cargo to be discharged, vessel size and choice of stevedore. Assuming that there has been little change in the number of containers exchanged per port call, changes in the number of days in port can be said to reflect a change in how the liner operator believes a port is performing.' (Carlson 1993).

elapsed time (or 46 per cent) per reefer vessel, and an extra 48 hours (or 130 per cent) per vessel for other general cargo ships (BTCE estimates based on WIRA data).

Systematic statistical data on general cargo stevedoring performance are not available for the post-WIRA period, so that anecdotal evidence, some it of a quantitative nature, gathered on the BTCE's industry visits, has been drawn upon.[10] The general tenor of the anecdotal evidence does not reflect the good improvements in productivity which are apparent in the data for the WIRA period.[11]

There may be a number of reasons for this. First, employers' expectations of further performance gains under their EAs may not have been realised. Productivity in conventional stevedoring is heavily dependent on both the machinery used and the skills of the labour force. While staffing scales for stevedoring gangs have been reduced, the machinery used has been fairly constant, and many workers skilled in conventional stevedoring[12] had left the workforce by the end of the WIRA process. Second, the recent deterioration in waterfront performance evident in container stevedoring may also apply to conventional stevedoring. Third, this may reflect the fading of the so-called 'Hawthorne effect', a phenomenon widely observed in industrial engineering studies, where the performance of workers whose tasks are subject to analysis measurably improves, simply because the workers appreciate the interest being taken in their role (Stoner, Collins & Yetton 1985).

BHP Transport — which operates ships and also has a stevedoring subsidiary, BHP Stevedoring (BHPS) — formerly Port Waratah Stevedoring, had achieved significant gains in labour productivity following the introduction of its EAs. For example, average tonnes per person-hour had increased from 6.4 in 1984 to 12.5 in 1994 (BHP 1994). Nevertheless, in discussions with the BTCE in early 1994, the company was concerned that productivity appeared to be declining. BHP also noted that although it had made significant stevedoring gains, its

---

10. PSA data on price changes for non-containerised stevedoring, including for the post-WIRA period, are discussed in appendix II.
11. However, examples given in industry journals somewhat earlier than the BTCE's visits imply substantial productivity gains. One such example is that in *Australasian Ships & Ports* (December 1993) of the rate of handling timber in Melbourne having increased from 250 to 630 bundles per gang-shift (Erg 1993).
12. The variety of cargo types and stowage patterns makes worker skill and experience a very important factor in conventional stevedoring.

**TABLE 3.4 STEVEDORING PRODUCTIVITY — CONVENTIONAL SHIPS**
*(tonnes / person-shift)*

| *Port* | *1989* | *1992* |
|---|---|---|
| **Non-reefer** | | |
| Sydney | 1.09 | 2.16 |
| Melbourne | 1.21 | 3.36 |
| Brisbane | 1.12 | 2.40 |
| Adelaide | 1.16 | 1.61 |
| Fremantle | na | 1.33 |
| Major ports | 1.16 | 2.29 |
| **Reefer** | | |
| Major ports | 7.46 | 12.69 |

na not available

*Source* WIRA (1992c).

competitors were also improving and that its stevedoring costs were still expensive compared with ports in other countries (BHP 1994).

An importer of steel and machinery from Japan and of steel from Korea stated that the smaller ports of Gladstone and Newcastle are very much better than in the past. Waterside workers in these ports were described as having a positive attitude which led to improved productivity, which has been maintained. This was said to be in contrast to the present attitude in Sydney and Melbourne, where waterside labour had a poor attitude towards the necessity for improved performance. Brisbane was described as a model port, with ships consistently being finished within the estimated number of shifts.

An importer of paper said that, for handling reels of paper, productivity had at first increased to about the New Zealand levels,[13] but had now declined to pre-reform levels. The fact that its stevedore no longer had an incentive scheme for general cargo was suggested as a possible reason.

13. The importer claimed that in New Zealand about 140 reels are handled per hour. In Melbourne productivity had reached 160 reels per hour, with 120 per hour being normal. However, productivity had since declined to 95 per hour by early 1994. Similarly, in Sydney productivity had reached 170 per hour but had then fallen back to 95 to 100.

BHPS stated that its productivity rates generally do not reach the benchmark levels beyond which bonuses are payable under its incentive scheme.[14] However, this varies between ports: for example, Port Kembla and Whyalla never achieve this level, but Westernport does about 80 per cent of the time. The incentives in the EA have been slightly modified to the benefit of the employees but this has had little effect. BHPS believes the benchmarks, which were set in consultation with the union, are quite achievable: it is achieving these rates on the same ships in overseas ports (in the USA, Chile and New Zealand) that use similar equipment.

AS in Sydney said that its incentive schemes for general cargo were as effective as for container operations. This experience differs from that of Conaust which claimed that incentive schemes had not been effective for general cargo, principally because of variability in the quality of cargo stowage. AS's best estimate was that around 50 per cent of shifts received incentive payments at Darling Harbour and about 70 per cent in Melbourne.

Overall, it is difficult to generalise about non-containerised general cargo stevedoring performance. However, the anecdotal information for the post-WIRA period, albeit from a limited range of sources, is fairly consistent. It conveys the view that the substantial average improvements in performance experienced during the WIRA period are being seriously eroded in Sydney and Melbourne. The situation in other ports appears uneven, although the data do not exist to allow of any categorical generalisations. Effective incentive schemes tailored to the cargo mixes of particular locations may be required for sustained improvements in general cargo stevedoring performance (the effectiveness of incentive schemes has been discussed in chapter 2).

## BULK CARGO STEVEDORING

Grain terminals have benefited significantly from the WIRA process through large reductions in stevedoring staffing, more flexible working arrangements, and reductions in stevedoring costs. The Australian Wheat Board (AWB) has estimated that savings to grain shippers from

---

14. BHP Transport supplied graphs of tonnes per person-hour, tonnes per gross gang-shift and tonnes per day during 1994, for various categories of steel products fron several ports, which show considerable variability in performance from week to week. Trend lines were close to horizontal on average overall, and lay well below the benchmarks in most cases.

waterfront reform and continuous loading have been of the order of $35 million per year (AWB 1993b).

**Bulk stevedoring productivity**

Using WIRA data, the BTCE estimated that 61 per cent fewer person-shifts were required to load grain in the September quarter 1992 at productivity rates per person-shift prevailing at the end of the WIRA process than would have been required at 1989 productivity rates. Reductions in staffing have also been made for stevedoring other bulk cargoes, including fertiliser and alumina. The BTCE estimates that almost 14 per cent fewer person-shifts were required to unload bulk fertiliser in the September quarter 1992 than would have been required at 1989 productivity rates.

Since the completion of the WIRA process, comprehensive productivity statistics are no longer collected, so that the BTCE conducted a case study of three bulk grain terminal operations:

- Newcastle in New South Wales, where the grain terminal operator won the stevedoring contract, and stevedoring labour is provided by the terminal workforce, under supervision provided by a stevedoring company;
- Albany in Western Australia, where the stevedoring company hires labour from the port authority's integrated port labour force (IPLF); and
- Port Lincoln in South Australia, where the stevedoring company now has only two part-time employees, as well as a supervisor.

Appendix V contains more information regarding reform of grain stevedoring in these ports.

Although there are major differences between the three ports in the way stevedoring is now arranged, operations in all three grain terminals have benefited significantly from the WIRA process. Over the WIRA period, tonnes per person-shift for first-port loads increased by 77 per cent in Newcastle, 111 per cent in Albany, and 158 per cent in Port Lincoln.

Data collected for the case study indicate that in two of the three ports there was also a significant increase in productivity per person-shift between 1992 and 1993: 40 per cent in Newcastle and 35 per cent in

Albany. In Port Lincoln the data supplied did not allow a firm conclusion to be drawn, but there did not seem to be any further improvement after the end of the WIRA period.

By 1994, stevedoring staffing had been reduced by almost 75 per cent on average in the three ports since pre-WIRA days. There was widespread agreement among the waterfront participants interviewed that stevedoring staffing had now been reduced to a minimum consistent with safety.

### Bulk vessel turnaround times

Using WIRA data for elapsed times, the BTCE estimates that an extra 190 ship-days (or 33 per cent) would have been required to stevedore grain cargoes for the September quarter of 1992 had productivity still been at 1990 levels. For bulk fertilisers, an extra 11 ship-days (or 7 per cent) would have been required.

Average turnaround time in Newcastle has fallen from about 4.5 days five years ago to about 1.5 days now, in part because the AWB is prepared to pay overtime to work additional shifts. However, average loadings are also smaller: in the last half of 1993 the average loading was about half that in the first half of 1990.

In Albany, for an average first-port loading, Co-operative Bulk Handling (CBH) said that the loading time has decreased from about 3 shifts to about 2.5 shifts (Albany terminal is a three-shift operation). The port's general manager said that vessel turnaround had dropped from 2 or 2.5 days to about 1.5 days. The operational flexibility provided by an integrated port labour force appears to be a factor favouring shorter turnaround times for ships.

In Port Lincoln, the port manager and a shipping agent felt that improvements in turnaround times had been minor. Lack of flexibility in ordering mooring gangs, tugs and pilot were said to be an impediment to realising the potential gains in vessel turnaround times from improved grain loading performance.

## EQUIPMENT AVAILABILITY

Statistical data on equipment availability are not available, leaving industry opinions as the only major base for assessing performance. This

evidence is mixed, but on balance was not particularly positive, at least on the east coast. This section should be read in conjunction with the section on maintenance labour arrangements in chapter 2.

AS in Sydney said that there had been no significant improvement in equipment availability. There were said to be problems in getting acceptance from the union on the concept of contracting out maintenance. However, Conaust in Sydney stated that the maintenance situation was improving, with fewer claims that equipment is not available due to breakdown. More recently, the MUA claimed that the CTAL terminal lacked a properly planned maintenance schedule (Farynski 1994).

BHPS stated that there had been no change in shore equipment reliability since pre-WIRA times. In their own stevedoring areas there has been no multi-skilling between maintenance and other areas. It was said to be a problem of attitude and trade skill barriers.

Sea-Land in Adelaide said that planned availability is currently at 90 per cent, with no losses during operations. Sea-Land could not see any change from the period prior to their taking over the terminal.

AS in Fremantle said that NTAL had had a contract with the Fremantle Port Authority (FPA) to do all maintenance, using MUA labour. When personnel were made redundant in the FPA restructuring, maintenance work quality dropped. However, maintenance is now contracted out to a new company, and was thought to be going well. AS in Fremantle noted that competition between AS and Conaust was based on a combination of price and service quality, including equipment availability.

Conaust in Fremantle said that when the FPA restructured, Conaust took over all its own maintenance, using MUA workers. Availability has improved, as Conaust has better control over the whole process.

In some of the IPLF ports in Western Australia, as stevedoring of vessels is always given priority, some problems have been experienced in keeping abreast of maintenance work. While this may well affect maintenance of port infrastructure more than maintenance of the stevedoring equipment, the possibility appears to exist for problems to arise with equipment availability when there is pressure on labour resources. Contracting out of maintenance of some of the stevedoring equipment involved (forklifts, front-end loaders, etc.) could be a viable option in such ports.

## TRUCK PROCESSING TIMES AT CONTAINER TERMINALS

The BTCE (1990) estimated that average truck turnaround times in 1988 were 1.88 hours in Melbourne and about 2.5 hours in Sydney, well in excess of the 30 minutes which was felt to be achievable. This symptom of waterfront unreliability resulted in an estimated $45 million decrease in national welfare in 1988, largely borne by shippers in the form of demurrage charges by truck operators.

The situation has greatly improved since then. In 1993, the Australian Peak Shippers' Association (APSA) submission to the Review of Part X referred to reduced or nil truck queues (p.35). Shipping Conferences Services, in its submission to the Review of Part X (1993, p.19), stated that truck detention costs, which had been up to $300 per teu some years ago, were now 'down to negligible levels'.

BHP Transport, in its submission to the Review of Part X (1993, p.37), stated that its truck demurrage costs had been reduced, particularly for exports, and provided an example:

> for our exports through Melbourne, our demurrage bill has fallen from A$5/t in 1990 to just under A$1/t by the end of 1992 and has further reduced during 1993 [in total] by about $80 per container.

The Port of Melbourne Authority (PMA) advised (1994 personal communication) that truck queues had virtually been eradicated at terminals in that port. It considered that there was no longer any justification for demurrage charges, given that the truck booking systems introduced by the terminals aim for a lapse of no more than 15 minutes before service (and demurrage is traditionally related to a quarter-hour minimum).

However, the Victorian Road Transport Association (VRTA) disagreed, as problems with the booking systems (teething problems in some cases, in others more fundamental system problems) have meant that occasionally there have been some instances of substantial delays (VRTA, pers. comm. 1994). The situation has improved so much, however, that importers and exporters are now refusing to pay claims for truck demurrage.

The PMA advised that average truck turnaround times had fallen to 77 minutes by December 1992 (the latest statistics available), a reduction of 0.6 hours or 32 per cent from 1988 in Melbourne. The VRTA (pers.

comm. 1994) considered 45 minutes a reasonable estimate of early 1994 turnaround times, a reduction of 60 per cent since 1988.

Terminal operators in Sydney advised (pers. comm. 1994) that average truck turnaround times had fallen to about 45 minutes in Sydney/Port Botany in late 1993 and early 1994 — a reduction of about 1.75 hours or 70 per cent. By and large, truck queues were no longer a problem, although one could develop from time to time.

Compared with the 1988 turnaround times of 1.88 hours in Melbourne and 2.5 hours in Sydney, the current levels of 45 minutes represent a reduction of excess turnaround times of 82 per cent for Melbourne and 87 per cent for Sydney. Weighted by teu throughput, an overall reduction of about 85 per cent has been achieved. Cost savings in 1993 due to these reductions in truck delays are estimated in appendix III. However, in early 1995, truck queues were again evident, especially in Sydney, suggesting that the gains achieved by 1993 were being eroded.

There remains scope for improvement in the interface between wharf and land transport. For instance, the hours during which trucks are loaded in terminals could be extended, to better utilise the restricted hours during which consignees generally are willing to accept containers into store. By loading trucks towards the ends of midnight shifts, beginning, say, at 5 am or 6 am, many trucks would be able to make three collection runs per day instead of two.

## CONTAINER DEPOTS

Prior to the WIRA process, container depots were generally conceded to be inefficient and high cost operations. A change in the requirements of the Australian Customs Service for the licensing of container depots has since seen almost all depot operations shifted to off-waterfront locations. A few depots remain in waterfront locations covered by the MUA. These include those of Liberty Cargo Systems (LCS) in Sydney and Melbourne, and that operated by the FPA.

Off-waterfront depots are staffed by members of unions other than the MUA, often the Transport Workers' Union or the Storemen and Packers' Union. This must be borne in mind when considering the depot performance statistics in table 3.5, which are drawn from BTCE (1993b). The changes in depot performance are primarily due to factors other than the WIRA reforms, but the data are a pointer to the degree of inefficiency that prevailed in depots in the pre-WIRA period.

The figures in table 3.5 indicate a substantial improvement in container depot performance, over performance in 1987 and 1988, in the limited period of 1993 for which data were analysed. Mean days for cargo to become available were reduced by 47 to 75 per cent in Sydney, and by 30 to 44 per cent in Melbourne.

The times for 90 per cent of cargoes to become available were also reduced substantially by early 1993: by 40 per cent in Sydney, and by 27 per cent in Melbourne, over their best quarterly performances of 1987 or 1988. Note that days are calendar days elapsed, not working days elapsed.

Much of the improvement in depot performance to 1993 can be attributed to the increased competition in the industry. During the period analysed in 1993, 11 depots in Sydney and 8 in Melbourne advertised container availability in the *Daily Commercial News*. Over a seven-day period in September 1994 there were 10 depots advertising container availability in Sydney and 24 in Melbourne. This suggests that the market is at least as competitive as it was in Sydney in 1993 and much more so in Melbourne. Competitive pressures are likely to have ensured that performance is at least as good as it was in 1993.

**Liberty Cargo Systems**

Liberty Cargo Systems operates the last MUA depots in Sydney and Melbourne. Liberty state that 70 per cent of cargo is available within 24 hours, and 90 per cent within 48 hours. The latter is much lower than the 1993 sample average 90 per cent availability times in table 3.5. Packing and unpacking costs and charges have fallen by 40 to 60 per cent from those obtaining before the WIRA process.

LCS started to operate at the start of the WIRA period, and had an EA before there were EAs elsewhere on the waterfront. LCS considered the employees' attitude to be 'all right', but did not consider that it had changed over the WIRA period or since, or that there had been a change in culture. LCS had no incentive scheme, considering such schemes in MUA depots did not work.

**TABLE 3.5 LCL DEPOT PERFORMANCE**
*(Mean days for cargo to become available)*

| | *1987 and 1988* | *1993*<br>*19 January to 8 February* |
|---|---|---|
| **Sydney** | | |
| Mean | 10 (best qtr)<br>21 (worst qtr) | 5.4 |
| 90% availability | 15 (best qtr)<br>>30 (worst qtr) | 9 |
| **Melbourne** | | |
| Mean | 10 (best qtr)<br>12 (worst qtr) | 6.9 |
| 90% availability | 15 (best qtr)<br>20 (worst qtr) | 11 |

*Source* BTCE (1993b).

### Fremantle Port Authority depot

Productivity in the FPA depot increased by 105 per cent from 1990–91 to 1992–93, from 126 teus to 258 teus per employee per year. Depot charges to pack or unpack have fallen from $600 to $380 per teu.

The FPA depot operates an incentive scheme, and workers' breaks are now staggered so as to provide an uninterrupted service from 0730 to 1630. An FPA spokesman said that the benefits of reform had been maintained post-WIRA, and that an enterprise focus had been developed.

A Fremantle customs broker stated that LCL availability has 'improved out of sight'. Some LCL cargo from Asia is now available before FCLs become available. He said that whereas the depot might unpack a maximum of 10 boxes per shift before reform, now they do 30 easily. The customs broker described competition between the various depots in Perth and Fremantle as 'very good'.

## INTEGRATED PORT LABOUR FORCE (IPLF) PORTS

Integrated port labour forces have been adopted for certain regional ports, particularly in Western Australia. Burnie, Geelong and Darwin are other ports with an IPLF scheme in place.

This section examines the background, performance and cost savings of the Western Australian IPLFs. Labour arrangements for the various IPLFs have been discussed in chapter 2.

## Western Australian IPLFs: background

In 1992 Western Australia introduced IPLFs in Esperance, Albany, Bunbury and Geraldton. This involved the port authority and stevedoring labour forces being brought into a single structure operated by the port authority, together with reform of staffing scales and work practices. The Western Australian Department of Transport (WA DoT) noted that while the IPLF had its genesis prior to the In-Principle Agreement, the process was driven by the knowledge that waterfront reform would render existing arrangements unfeasible.

The regional ports used to have twice as many workers as needed, and very high levels of stevedoring idle time were sustained by cross-subsidy from major ports. The industry reaction was to 'casualise' the ports, but the Labor Government of the day did not favour this approach. The Chairman of Western Australia's tripartite Port Operations Task Force, an ex-seaman who had experience of integration on board ships, asked why this approach could not be taken in the ports.

## Western Australian IPLFs: productivity improvements

Total stevedoring and port labour forces were reduced by 30 to 50 per cent, and productivity increased by 66 to 112 per cent. The WA DoT estimates the aggregate port and stevedoring labour cost savings to be 23 to 42 per cent.

In Albany, the IPLF has reduced stevedoring employment levels for grain and phosphate by about half. For grain, staffing has gone from five down to two: there used to be spelling with two hours on and two hours off, but now the worker stays on the job for the shift. Loading stops for work breaks, however, as continuous running has not yet been adopted in Western Australia. For phosphate, staffing has gone from two deckhands down to one deckhand per crane.

The port general manager in Albany stated that there had been a 35 per cent increase in productivity under the IPLF. Grain loading rates used to be 8 000 tonnes per shift; now they are about 10 000 tonnes per shift, as IPLF work breaks have been coordinated with those of the terminal

workforce, and the IPLF no longer get walk times, etc. There are no incentive schemes under the IPLF.

### Western Australian IPLFs: working arrangements

Stevedoring takes precedence over other port work for the IPLF. This has caused some problems with completing port maintenance, and casuals have had to be used.

The IPLF is totally integrated: for example, in Albany the receptionist worked the midnight shift as a Level 4 the night before the BTCE visit. Maintenance men, even the mechanics, will do other work when they have spare time.

The IPLF is flexible for local conditions. For example, loading a ship will start in mid-shift if necessary. Day shift labour will go home (with a minimal payment) if not required till the afternoon shift because of a delay in a ship arriving.

As far as AS was concerned, the regional ports IPLFs, which mainly involved stevedoring grain, were working well. AS now use an IPLF Level 5 or 6 instead of a foreman, whereas it used to have to send two highly paid supervisors to the regional ports, and contracts were not cost-plus.

A spokesperson for the Western Australian Department of Transport said that there is now no real reason for the involvement of the stevedoring companies, which merely get IPLF labour on subcontract and fly in a qualified stevedore. Ports employing qualified ex-Conaust employees are thinking of bypassing the stevedoring companies. However, at present Co-operative Bulk Handling has State-wide contracts for stevedoring.

### Western Australian IPLFs: the future

Most possible performance gains have already been made, other than technology improvements on the land side, and labour rationalisation has gone just about as far as it can. For example, in Albany everyone except the general manager and pilots is a member of the IPLF, and ultimately all will be. However, the IPLF award is a Federal one, and the Western Australian State Government will not allow the pilots to go into the IPLF at present.

The WA DoT spokesman described the IPLFs as 'one of the unsung success stories of waterfront reform'. He said that integration eventually could extend to the tugs and the local airport.

## CONCLUSION

- Significant improvements in productivity and reliability were achieved over the WIRA period.
- These performance improvements, together with the reduction in the size of the workforce, the restructuring of working arrangements, and the reduction in stevedoring prices (see chapter 4), indicate a significant improvement in the efficiency of the waterfront.
- There appear to have been further improvements in productivity in the quarters immediately after the WIRA period, although data are lacking.
- More recently, however, there are indications of a falling-off in performance. In Sydney, Melbourne and Brisbane, performance has fallen below the levels reached at the end of the WIRA period.
- However, it is perhaps too early to say whether this represents an ongoing adverse trend or whether 'one-off' factors were responsible. Ongoing monitoring of stevedoring performance will be needed to determine this.

# CHAPTER 4 THE DISTRIBUTION OF THE BENEFITS OF STEVEDORING REFORM

The waterfront industry has as its primary purpose to provide an interface to facilitate the transfer of goods between land and sea transport. Figure 4.1 shows diagrammatically the relationship between the major commercial buyers and sellers of waterfront services in the non-bulk sector: shippers, stevedores and ship operators.

Although different parties may initially pay the costs involved in transferring the goods, the owners of these goods, importers and exporters, ultimately bear the costs. Some of these owners are Australians and the remainder are foreign importers and exporters.

The waterfront industry reform program was intended to reduce stevedoring costs and improve industry performance. Benefits in these areas have clearly been achieved.

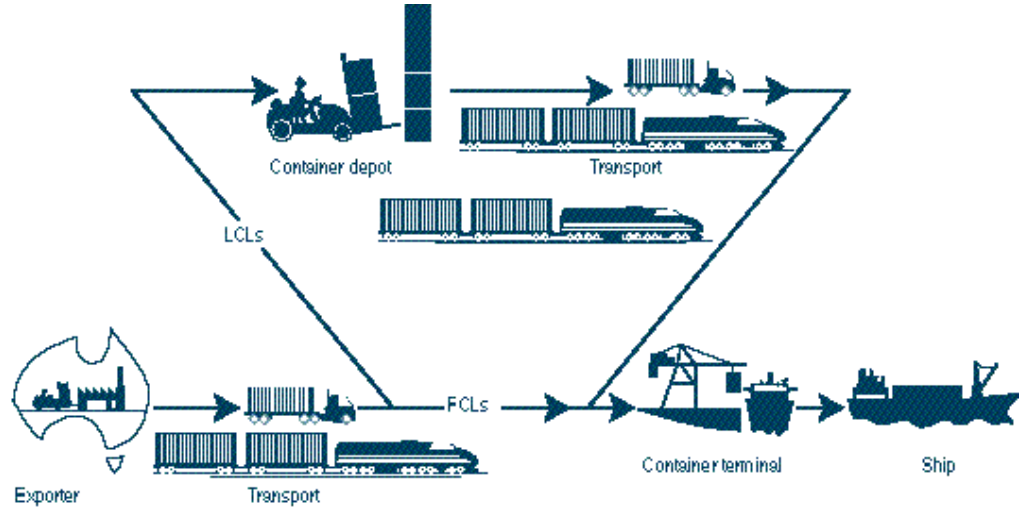
A key issue in assessing the success of the program is the extent to which the benefits have flowed to Australian importers and exporters. The chain leading from the generation of the benefits to cargo owners is not always direct. The potential exists for the benefits to be captured before they are in the hands of importers and exporters.

This chapter outlines the way BTCE has estimated how the benefits of reform have been distributed among the various parties. More details of the methods used to make the estimates, and of the supporting arguments, are to be found in appendix II and appendix III.

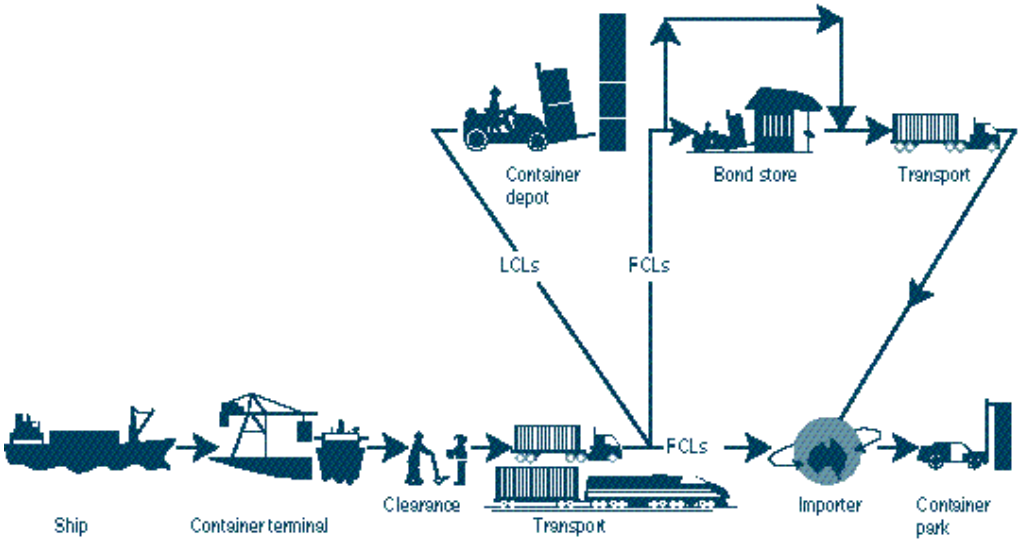
## FRAMEWORK FOR ANALYSIS

The former chairman of WIRA, Mr Peter Evans, categorised the benefits of waterfront reform in terms of improved system efficiency and reliability, and reductions in costs and freight rates (Evans 1993). Figure

**FIGURE 4.1 WATERFRONT RELATIONSHIPS: NON-BULK SECTOR**



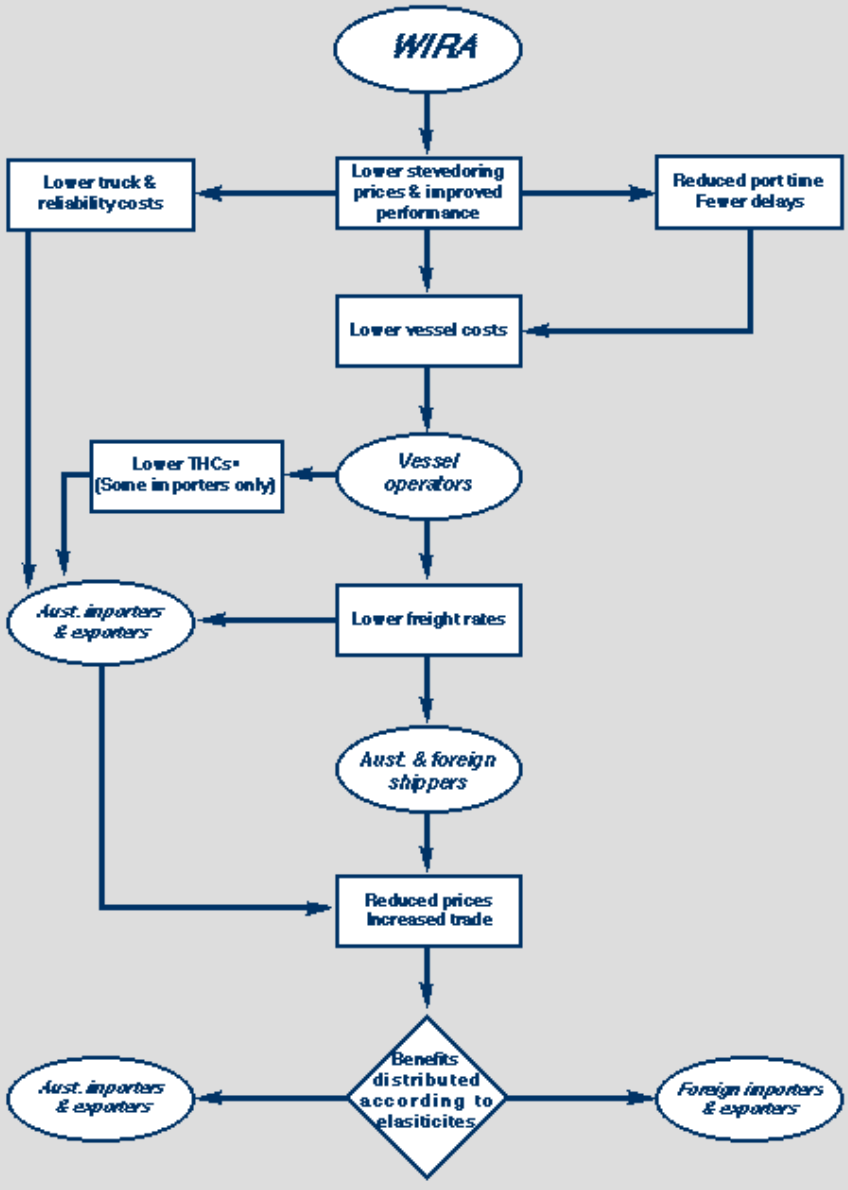

Export containers: physical flow pattern




Import container trade: physical flow pattern

*Source* BTE (1986).

**FIGURE 4.2 DISTRIBUTION OF STEVEDORING INDUSTRY REFORM BENEFITS**




a. THC—terminal handling charges.

*Source* BTCE analysis.

BTCE

4.2 illustrates in simplified form how these benefits flow to participants in international container sea transport. The benefits to non-containerised general cargo are distributed in a similar way. In the bulk sector, the vessel is generally owned or chartered by the shipper, who contracts with the stevedoring company for loading or unloading.

The WIRA process resulted in lower stevedoring prices and improved waterfront performance. The improved performance has led to reduced road transport costs for Australian importers and exporters, through reduced truck queues at container terminals, and hence lower demurrage payments. Improved reliability has also led to lower costs through lower inventory levels and reduced risk of lost sales (BTCE 1990).

Improved stevedoring performance and lower stevedoring prices have reduced vessel operators' costs. Vessel operators are able to pass on these savings to Australian and foreign cargo owners in the form of reductions in freight rates. For some Australian importers, the savings passed on will be from both lower freight rates and a direct benefit through lower terminal handling charges.

Lower freight rates can lead to lower landed or cif (cost, insurance and freight) prices for the goods being traded, and this price reduction, as well as the improved quality of service vessel operators are now able to provide, would encourage an increase in trade volumes.

The foregoing description has not taken any account of the possibility of impediments that could prevent the benefits from flowing from one group to the next. For example, the possession of market power by one group could prevent a flow-on of benefits to others. This aspect is addressed below and in appendices II and III.

It is important to note that it is not only Australians that can potentially benefit from the reforms. Foreign trading partners are also likely to share in the benefits. The benefits of the increased trade are finally distributed to Australian and foreign importers and exporters in accordance with the elasticities of supply and demand of the goods being traded.

## REDUCTIONS IN STEVEDORING COSTS

By the end of the WIRA process in October 1992, the labour force had been reduced by 57 per cent. Labour force reductions and the consequential improvement in productivity have led to lower stevedoring costs.

**Containerised cargo**

Monitoring by the Prices Surveillance Authority has estimated that costs of moving a container across the waterfront declined by $76 or 29 per cent between 1990 and 1993 (PSA 1994a). This represents a cost saving to stevedores of about $147 million in 1993. However, the downward trend had slowed by 1993.

Analysis in appendix II indicates that not all of this decline in costs can be attributed to waterfront reform. About 20 per cent of the cost reductions were due to reductions in depreciation costs and reduced interest charges, which are unrelated to waterfront reform. The savings to stevedores attributable to waterfront reform were thus about $117.6 million in 1993.

**Non-containerised general cargo**

Between 1989 and 1992 productivity per person-shift for stevedoring non-containerised general cargo almost doubled, and for non-containerised reefer cargoes improved by almost 70 per cent, in the five major ports (WIRA 1992b). Based on these improvements in productivity, the BTCE estimates that 16 500 fewer person-shifts were required in 1992 compared with the number required at 1989 productivity levels. This labour saving is equivalent to a cost saving of $18 million in 1992, including an estimate for savings in regional ports (see appendix II).

Although cargo volumes increased in 1992, the BTCE has taken a conservative approach and assumed that 1993 savings are the same as those estimated for 1992. Ship operators using general cargo facilities told the BTCE their experience was that no further gains in productivity had been achieved in 1993 and, for some, productivity had declined. Most general cargo contracts are of the cost-plus type which would reduce the incentive to pursue further productivity gains.

Stevedores did not disagree with the view that productivity had not improved during 1993 in general cargo operations. The assumption of no increase in the value of benefits in 1993 recognises the anecdotal evidence and takes account of those for whom productivity had declined.

### Bulk cargo

Grains and fertilisers are the main bulk cargoes affected by stevedoring reform.

Based on WIRA data, the BTCE estimates 63 per cent fewer person-shifts were required to load grain during the first three quarters of 1992 at prevailing productivity rates per person-shift than would have been required at 1989 productivity rates. The saving was estimated at $2 million in 1992.

Data collected for the case study of grain ports (see appendix V) indicate that there was a further increase in productivity per person-shift between 1992 and 1993 of about 30 per cent. There was also an increase in exports of bulk grain from about 10.4 million tonnes to 12.4 million tonnes. The savings in 1993 from reductions in grain stevedoring staffing are estimated to be $3.1 million, compared with the costs which would have been incurred at 1989 productivity rates (see appendix II).

Savings in the stevedoring of fertilisers are estimated in appendix II to have been about $500 000 in 1992 and $700 000 in 1993. The total saving in bulk stevedoring costs is therefore estimated to have been $2.5 million in 1992 and $3.8 million in 1993.

## REDUCTIONS IN STEVEDORING PRICES

There have undoubtedly been substantial reductions in the costs of stevedoring cargoes, but have these savings been passed on to the customers of the stevedoring companies?

The theory presented in appendix I is based on the observation that terminal operators have declining average costs. A terminal operator with excess capacity would have a strong incentive to attract new customers by offering prices less than average cost but more than marginal cost. The theory suggests that stevedores will compete to gain market share and at the margin prices will be bid down to possibly less than average costs. Under these conditions it can be expected that cost savings will be passed on to ship operators. But has this occurred in practice?

**Containerised cargo**

The results of PSA monitoring, discussed in appendix II, show that average stevedoring revenue per teu declined by $61 between 1990 and 1993. This is $15 or 20 per cent less than the $76 per teu reported for reductions in average stevedoring costs. However, in 1990 average costs had exceeded average revenue by about $8 per teu.

The difference in the extent of cost and price reductions can be explained by stevedores bringing costs and revenues into line: for the years 1991 and 1992, and for the first half of 1993, the PSA (1994a) has shown that average costs and revenues were virtually the same. In the first half of 1993, average expenses of $191 exceeded by a dollar the average revenues of $190. It is therefore reasonable to conclude that stevedores had passed on fully the cost reductions they had gained in those periods.

In the second half of 1993, stevedoring revenues and expenses diverged: average revenues increased to $195, while average expenses fell to $180. Annual averages for 1993 (see appendix tables II.1 and II.3) showed the largest margin ($7) of average revenues ($193) over average expenses ($186) since 1988, when average revenues were $244 and average expenses were $227.

The saving in expenditure (totalling $10.6 million) was retained by stevedores. There is some justification for retention of the benefits of lower unit costs. The PSA (1994c) notes that to encourage 'modernisation of their capital stock, the companies will have to maintain the improvements in margins'. Much of the decrease in costs was due to increased throughput allowing fixed costs to be shared among a larger number of containers (PSA 1994c). The BTCE's best estimate is that $3 million of the $10.6 million retained by stevedores was a result of waterfront reform.

Offsetting gains for ship operators is the requirement for them to pay the Statutory Tonnage Levy to meet the costs of redundancies. The levy is presently set at $1.25 per tonne for international cargo and $0.25 per tonne for coastal cargo. The average net reduction is therefore about $47 per teu in 1992 and $49 per teu in 1993.

The BTCE estimates that total container stevedoring cost savings, net of the levy, which were made by ship operators were $86.9 million in 1992 and $94.8 million in 1993. Current expectations are that the levy will cease toward the end of 1995, after which the benefits of reform received by ship operators should increase.

Not all of the reduction in stevedores' costs can be attributed to stevedoring reform. About 20 per cent of the savings were due to reductions in interest rates and depreciation charges (PSA 1994a). Thus, only 80 per cent of the savings are attributable to waterfront reform, or $69.5 million in 1992 and $75.8 million in 1993 (see appendix table II.5 and appendix table III.3).

Terminal operations in 1993 were characterised by a general excess of capacity. It can be expected that the incentive to pass on cost savings (so as to attract additional custom) will be maintained while this excess capacity continues. As time goes by, the excess capacity could be reduced in some ports. Then the incentive to pass on cost savings would be correspondingly reduced, and pressure for price increases would strengthen. The first signs of this may have been seen in the second half of 1993.

**Non-containerised general cargo**

Data on the extent to which cost savings for non-containerised general cargo have been passed on are difficult to obtain. However, the PSA (1994a) estimates discussed in appendix II indicate that it is likely that cost savings have been passed on to ship operators carrying non-containerised general cargo.

However, the overall average reduction in stevedoring prices for general cargoes is probably much less than might have been expected, given the almost 100 per cent improvement in productivity per person-shift evident in the WIRA data towards the end of 1992.

The incentive to pass on savings is not as strong as with containerised cargo. This is because fixed costs are not as dominant in the cost structure of general cargo stevedoring as in container operations. General cargo stevedoring is more labour intensive and less capital intensive than container stevedoring. Improved labour flexibility following the reform of the industry would reduce the proportion of fixed costs.

Further, the smaller shipping lines involved in conventional shipping may not be as well placed as those engaged in container shipping to negotiate with the stevedoring firms for price reductions.

General cargo is diverse and requires a range of stevedoring techniques. There is a considerable range of vessel types in the general cargo trades, and these vessel types vary in the ease of cargo loading and discharge

operations. Stevedores state that the way the cargo is stowed can also have a major impact on stevedoring costs.

In some areas, stevedoring firms have chosen to increase quality of service rather than reduce prices. For example, in unloading cars from pure car carriers, stevedores are now offering extended delivery hours, better damage control, and some covered on-wharf storage. Hence stevedoring costs for some cargoes may not have decreased, and indeed may have increased.

In view of the data difficulties, and considering the PSA's estimates (see appendix II) of the effect on users of general stevedoring services, the BTCE has assumed that 80 per cent of the $18 million (that is, $14.4 million) in cost savings have been passed on to vessel operators.

### Bulk cargo

Shippers of bulk cargo are generally large companies in good negotiating positions when stevedoring contracts are arranged. It seems reasonable to assume that the negotiated prices for stevedoring of bulk cargoes fully reflect cost savings achieved by stevedores. On this basis, the savings to shippers were $2.5 million in 1992 and $3.8 million in 1993.

## REDUCTIONS IN SHIP TIME COSTS

As well as reducing costs, waterfront reform has greatly improved the speed at which cargo is handled. Ships are now turned around much faster than they were before the reforms. These time savings could be used by the vessel operator in a number of ways, although some ship operators have argued that the time savings are not worth very much until the number of ships used for a particular service can be reduced (see appendix II).

Some operators already appear to have taken advantage of the faster turnaround times to increase the number of port calls (ANZDL 1993a, PSA 1992a). More may do so in the longer term.

The operator could increase the number of voyages per year, using existing port call patterns and vessel operating speeds. The shorter transit times it could offer to shippers would constitute a marketing advantage. The effective increase in capacity would defer any need to deploy larger

vessels as trade levels increase. Alternatively, savings could be made due to a reduction in fuel costs from slower steaming.

These factors suggest that time saved in port may have value even if it is insufficient to allow a vessel to be withdrawn from the service. For this reason the BTCE has estimated the full value of the time saved as a benefit of reform.

### Containerised cargo

The savings in container ships' time is estimated to be about $40 per teu. In appendix II, estimates of the value of the savings are calculated, based on the effect of the reforms on an average sized ship and a large ship. For both ships the estimate was consistent with the $40 estimated by WIRA (WIRA 1992a).

Based on estimated saving to ship operators of $40 per teu, annual savings were $74.0 million in 1992 and $77.4 million in 1993.

### Non-containerised general cargo

Because of the diverse cargo types and variations in the way the same cargo can be stowed on different ships, it is not a simple task to generalise about the impact of waterfront reform on turnaround times of general cargo ships. WIRA attempted to overcome this problem by separating reefer cargo from other cargo types. Productivity in loading reefer cargo was measured in tonnes per hour and other cargo types were measured in 'units'.

The BTCE used the WIRA measures of performance to estimate time saved for general cargo ships. The savings were estimated to be $19.9 million in both 1992 and 1993 (see appendix II).

### Bulk cargo

WIRA reported loading rates for most of the bulk ports for both 1990 and 1992. Both loading rates were applied to 1993 tonnes loaded and the difference gave the savings in ships' time in loading bulk cargoes. The value of the time saved was estimated by using typical time charter rates for vessel sizes normally used for bulk grains and fertilisers.

The savings were estimated to have been $4.4 million in 1992 and $5.2 million in 1993 (see appendix II).

## BENEFITS ACHIEVED BY VESSEL OPERATORS

The BTCE estimates the benefits attributable to waterfront reform which have flowed to vessel operators at $182.2 million in 1992 and $192.7 million in 1993 (see appendix table II.5). Stevedoring price reductions accounted for $83.9 million of the 1992 savings due to waterfront reform, and for $90.2 million of the 1993 savings. Stevedores retained $6.6 million ($3 million for containerised cargo plus $3.6 million for non-containerised cargo) or 7 per cent of the $96.8 million of the savings which are potentially available for passing forward to vessel operators, and which can be attributed to waterfront reform.

## BENEFITS PASSED ON TO SHIPPERS

Ship operators have gained from waterfront reform in the form of reduced stevedoring prices and faster turnaround time of ships. If ship operators have a reasonable degree of market power they may be able to retain those gains and increase profits. Appendix III contains more details of the estimates for benefits received by shippers.

### Containerised cargo

#### *Stevedoring savings*

In principle, shipping conferences could be expected to provide significant market power for ship operators belonging to them. However, the existence of independent operators outside the conferences suggests that competitive forces are not absent in liner shipping markets. The countervailing power of shipper organisations also serves to reduce the market power of conferences.

The BTCE drew on work by Harvey (1993) for the Review of Part X of the Trade Practices Act to draw conclusions on the likely response of ship operators to changes in their costs. The summary of Harvey's arguments in appendix I suggests that it is likely that ship operators would adjust freight rates to reflect changes in operating costs and stevedoring prices.

Empirical evidence mostly supports the theoretical analysis. In most liner trades, freight rates have declined by more than the reductions in stevedoring prices and vessel time costs. Submissions to the Review of Part X of the *Trade Practices Act* generally supported the view that stevedoring price reductions were one of the factors influencing freight rate negotiations (see appendix III).

There are more factors influencing freight rates than stevedoring costs and it is not possible to be completely certain that freight rates would have been higher in the absence of waterfront reform. However, the fact that freight rates have moved in response to market forces is compelling evidence that reduced stevedoring and vessel time costs have been reflected in lower freight rates to shippers. The notable exception is for imports from North America, for which freight rates have not declined to the same extent, and for some shippers have increased slightly in Australian dollar terms.

Liner operators in most trades incorporate stevedoring prices in the freight rate. However, for imports from Europe and North America, shippers are charged separately by liner operators for terminal handling charges (THCs). THCs are not designed to fully recover stevedoring charges, but only 80 per cent for European imports and 40 per cent for imports from North America. THCs are discussed more fully in appendix III.

The PSA (1994b) has examined the level of THCs with a view to determining to what extent reductions in stevedoring charges have been passed on. The evidence suggests that changes in THCs reflect reasonably well the changes in stevedoring prices. The benefits of stevedoring reform passed forward as reductions in THCs totalled an estimated $7.6 million in 1993 (see appendix III).

Overall, with the exception of freight rates for imports from North America, freight rates and THCs for containerised cargo have adjusted to reflect changes in stevedoring prices. After making adjustments for imports from North America, the benefits of lower stevedoring prices passed on to shippers totalled $83.3 million in 1992 and $91.7 million in 1993 (see appendix table III.3). As noted earlier, only 80 per cent of these savings are due to waterfront reform or $66.7 million in 1992 and $73.4 million in 1993. That is, $2.4 million of stevedoring reform benefits were retained by ship operators in 1993.

### *Vessel operating cost savings*

As with stevedoring price savings, appendix II concludes that with the exception of imports from North America savings in vessel costs have been passed on to shippers. The savings to container ship operators were estimated to have been $74 million in 1992 and $77.6 million in 1993. The amount passed on to shippers is estimated to have been $68.1 million in 1992 and $71.2 million in 1993. That is, $6.2 million was retained by ship operators in 1993.

The total sum retained by ship operators is therefore $8.6 million ($2.4 million of stevedoring reform benefits plus $6.2 million of reduced vessel operating costs).

### Non-containerised general cargo

The discussion for containerised cargo carries over to non-containerised general cargo. The market conditions for general cargo shipping are similar to those in container shipping. It is therefore concluded that stevedoring price reductions and vessel cost savings due to waterfront reform will have been passed on to shippers. These savings are $14.4 million for stevedoring savings and $19.9 million for vessel operating cost savings (see appendix III).

### Bulk cargo

Bulk cargoes are generally shipped in chartered ships or in ships operated by the owners of the cargo. In either case, the shipper will initially benefit directly from reductions in ship operating costs due to stevedoring reform.

Bulk shippers normally pay the stevedore directly so any benefits of stevedoring price reductions will flow directly to the shipper.

For bulk cargoes the benefits of stevedoring price reductions were estimated to have been $2.4 million and $3.8 million in 1992 and 1993 respectively. Savings in vessel costs were estimated to have been $4.4 million in 1992 and $5.2 million in 1993. The total benefits to bulk shippers were therefore $6.8 million in 1992 and $9.0 million in 1993.[1]

---

1. In addition to the $9 million from stevedoring reform, substantial benefits were achieved through the implementation of continuous pouring (see appendix V). Benefits from continuous pouring were achieved by reform within the terminals and did not involve stevedoring labour.

## QUALITY-OF-SERVICE BENEFITS

Shippers of general cargo (containerised and breakbulk) gain additional benefits through improved quality of service. These benefits derive from improved predictability of cargo arrival and departure times, shorter transit times and reduced waiting times for trucks at wharves and terminals to deliver or collect cargo.

The BTCE estimated benefits due to reduced frequency delay, lower inventory costs, shorter transit times and reduced demurrage costs for trucks.

Although there is likely to be an increase over time in trade volumes as a result of improved quality of service following waterfront reform, benefits from this source have not been included in the analysis. It will take time for shippers to be confident that changes in waterfront performance will be sustained, so at this stage the effects on trade volumes are likely to be minor.

### Reduced frequency delay

Frequency delay is the difference between the most desired departure time and closest scheduled departure (BTCE 1993a). The improvement in Australian waterfront reliability has been sufficient to allow some lines recently to introduce fixed day sailings in the Australian liner trades. Vessels are advertised to sail periodically on a nominated day of the week. Frequency delay is reduced as shippers are better able to coordinate their production schedules with these fixed day sailings.

It is uncertain at this stage to what extent fixed day sailing schedules can be maintained in Australia. Some vessel operators have expressed scepticism that it is possible. However, one vessel operator commented that although a fixed day sailing could not be guaranteed, fixed day delivery of the cargo to overseas customers could be made.

Given the frequency of service to major destinations, it seems that greater certainty in sailing days is worth about one day of inventory for export liner cargoes. For the $15.4 billion of liner exports in 1992–93, the savings are worth $5.1 million, using a 12 per cent interest rate (see appendix III).

**Reductions in inventory costs**

Increased waterfront reliability means inventory levels at both ends of the transport leg can be reduced for a given risk of running out of stock. This yields benefits of lower interest and storage costs.

For Australian importers, the lead time for orders can be reduced with improved waterfront performance. The shorter time between the importer paying for the goods when the ship departs the overseas port and the goods being sold in Australia yields lower financing costs, at any given level of interest rates.

BTCE (1990) estimated that the costs of financing excess import inventory were $272 million in 1988, based on an implied rate of 21 per cent (BTCE 1990, p.40) and $42 million for storage. At 1993 interest rates and 1988 levels of unreliability, the costs of excess inventory are estimated to be $185 million (see appendix III).

Ship delays in 1992 were about one day per ship compared with four days in 1988 (see chapter 3). Excess inventory is needed to protect importers against unpredictable delays, and especially against unforeseen longer delays. Average delays are not a precise measure for the delays which excess inventory protects against, but they are a measure of overall delay performance. On this basis, it is estimated that excess inventory would have declined to $46 million by 1992 and 1993, or a reduction of $139 million.

However, not all of the reduction in ship delays occurred during the WIRA program. Of the three days reduction in delays per ship, two days reduction had been achieved by 1990 prior to the signing of the first enterprise agreements. That is, the reduction in inventory costs achieved since 1990 is estimated to be one-third of $139 million, or $46 million.

There are likely to be factors other than waterfront reform influencing the level of delays to ships. For example, improvements in port authorities and the towage industry may also have an effect. Furthermore, importers are likely to take some time before they are confident that the changes are permanent, and that inventory reduction is a safe strategy. For these reasons, only half of the estimated reduction (that is, $23 million) is taken to have been achieved.

**Shorter transit times**

Greater waterfront reliability reduces financing costs for exporters. Exporters normally must wait until the cargo is loaded on board the ship before they can claim payment from the buyer. Any delay to the ship in arriving at the port of loading and to the loading process after arrival in port delays the time the exporter can claim payment.

BTCE (1990) estimated excess transit times[2] due to waterfront unreliability of 4.5 days to 9.2 days for export cargoes, depending on the trade route. This represents the maximum potential reduction possible in transit times with improved waterfront performance. Excess financing costs on various trade routes amounted to an estimated $146 million in 1988.

Excess financing costs would be significantly lower today as a result of lower interest rates. Given the substantial (44 per cent) drop in overdraft interest rates between 1988 and 1993, the implied rate of 21 per cent imputed to inventories in BTCE (1990) would be more like 12 per cent today. At a 12 per cent interest rate, the 1988 figure would reduce to approximately $83 million.

Waterfront reform has resulted in a reduction of time on the Australian coast of one day (see appendix III). The saving of one day represents between 11 and 22 per cent of the excess transit time. Taking 16 per cent as typical of the reduced excess transit time gives a saving of $13 million (16 per cent of $83 million).

**Lower truck demurrage costs**

Average truck turnaround times in 1988 were 1.88 hours in Melbourne and about 2.5 hours in Sydney, well in excess of the 30 minutes which was felt to be achievable (BTCE 1990). At a truck demurrage rate of $40 per hour, the delays represented a cost of about $55 per teu on average in Melbourne and about $80 per teu in Sydney at that time. These costs were largely borne by shippers in the form of demurrage charges by

2. Excess transit time is the amount by which the actual transit time exceeds expected transit time. For the purposes of this chapter, expected transit time is the time elapsed between the expected time of sailing of the vessel from the port of origin of the cargo and the time of expected availability of the cargo at the port of destination.

truck operators. Truck delay costs resulted in an estimated $45 million decrease in national welfare in 1988 (BTCE 1990).

Compared with the 1988 turnaround times, the 1993 levels of 45 minutes represent a reduction of excess turnaround times of 82 per cent for Melbourne and 87 per cent for Sydney. Weighted by teu throughput, an overall reduction of about 85 per cent has been achieved.

At current trade levels and rates of truck detention charges (about $50 per hour, according to the PMA), the 1988 level of truck delays would have caused a welfare loss of about $56 million. Therefore, the reductions achieved in truck turnaround times represent a welfare gain of about $47 million (85 per cent of $56 million) for existing cargoes.

### Total quality-of-service benefits

The total gains from quality-of-service improvements are about $88 million per year (table 4.1). The major contributions are reductions in inventory costs ($23 million) and reduced truck demurrage costs ($47 million). Shorter transit times ($13 million) and reduced frequency delay ($5 million) are the remaining components.

**TABLE 4.1 SUMMARY OF QUALITY-OF-SERVICE IMPROVEMENTS**

*($ million)*

| *Savings category* | *Savings* |
|---|---|
| Reductions in frequency delay | 5 |
| Reductions in excess inventory costs | 23 |
| Shorter transit times door to door | 13 |
| Lower truck demurrage costs | 47 |
| Total quality-of-service gains | 88 |

*Source* Appendix table III.4.

### Total benefits to shippers

Table 4.2 summarises the overall estimated benefits to shippers. At this stage there are no satisfactory estimates of the effect of waterfront reform on export volumes. Anecdotal evidence provided to the BTCE supports the view that improved waterfront performance has been of assistance to exporters, but this evidence is not adequate to permit valid estimates to be made. For these reasons the effect of increased trade resulting from waterfront reform is not included in the estimates of reform benefits in this report. To the extent that trade has increased because of waterfront reform, the estimated total benefits in table 4.2 are understated.

## DISTRIBUTION OF BENEFITS TO AUSTRALIAN AND FOREIGN SHIPPERS[3]

The total benefits of waterfront reform gained by shippers are estimated to have been $276 million in 1993 (table 4.2). The benefits in the form of cost reductions are not retained totally by the importer or exporter initially receiving them. Lower costs will allow exporters to increase sales of the good or importers to demand more. The changed supply and demand conditions will influence the price of the good.

The distribution of the benefits will be in accordance with the existing incidence of transport costs. As explained in appendix I, this will depend on the elasticities of supply and demand for Australia's exports and imports.

For bulk cargoes, the flow of benefits is much simpler. Shippers of bulk cargo, generally using chartered or their own ships, initially receive both stevedoring and vessel cost saving benefits. They do not have to depend on vessel operators to pass them forward. However, the distribution of the benefits between Australians and foreigners involves the same mechanism for both bulk and non-bulk cargoes.

The calculations are summarised in table 4.3. Overall, 73 per cent of the benefits remained in Australia. Figure 4.3 illustrates how the benefits flow through the transport system, for containerised and non-containerised general cargo. Figure 4.3 also illustrates the point that, of the total benefits attributable to waterfront reform, about 95 per cent is eventually passed forward to shippers.

---

3. Includes both importers and exporters.

**TABLE 4.2 SUMMARY OF GAINS TO SHIPPERS IN 1993**

*($ million)*

| *Savings category* | *Savings* |
|---|---|
| **Containerised cargoes** | |
| Stevedoring prices | 73.4 |
| Vessel operating costs | 71.2 |
| Quality of service | 88.0 |
| Sub-total | 232.6 |
| **Non-containerised general cargoes** | |
| Stevedoring prices | 14.4 |
| Vessel operating costs | 19.9 |
| Sub-total | 34.3 |
| **Bulk cargoes** | |
| Stevedoring prices | 3.8 |
| Vessel operating costs | 5.2 |
| Sub-total | 9.0 |
| **Total** | 275.9 |

*Source* Appendix table III.5.

Some benefits are directly attributable to imports or exports. For example, reduced inventory costs are directly attributable to imports, and reduced transit time costs are directly attributable to exports. Remaining general cargo benefits are allocated to imports or exports in proportion to the value of liner imports and exports respectively.

Estimation of elasticities of import and export supply and demand is a contentious area of research. Using recent estimates of elasticities (see appendix I), the BTCE estimates that Australians gain 65 per cent of the benefits accruing to liner exports and 78 per cent of the benefits accruing to liner imports. For bulk grain exports, the BTCE estimates that Australians gain 68 per cent of the benefits.

**TABLE 4.3 DISTRIBUTION OF BENEFITS TO AUSTRALIAN AND FOREIGN SHIPPERS**

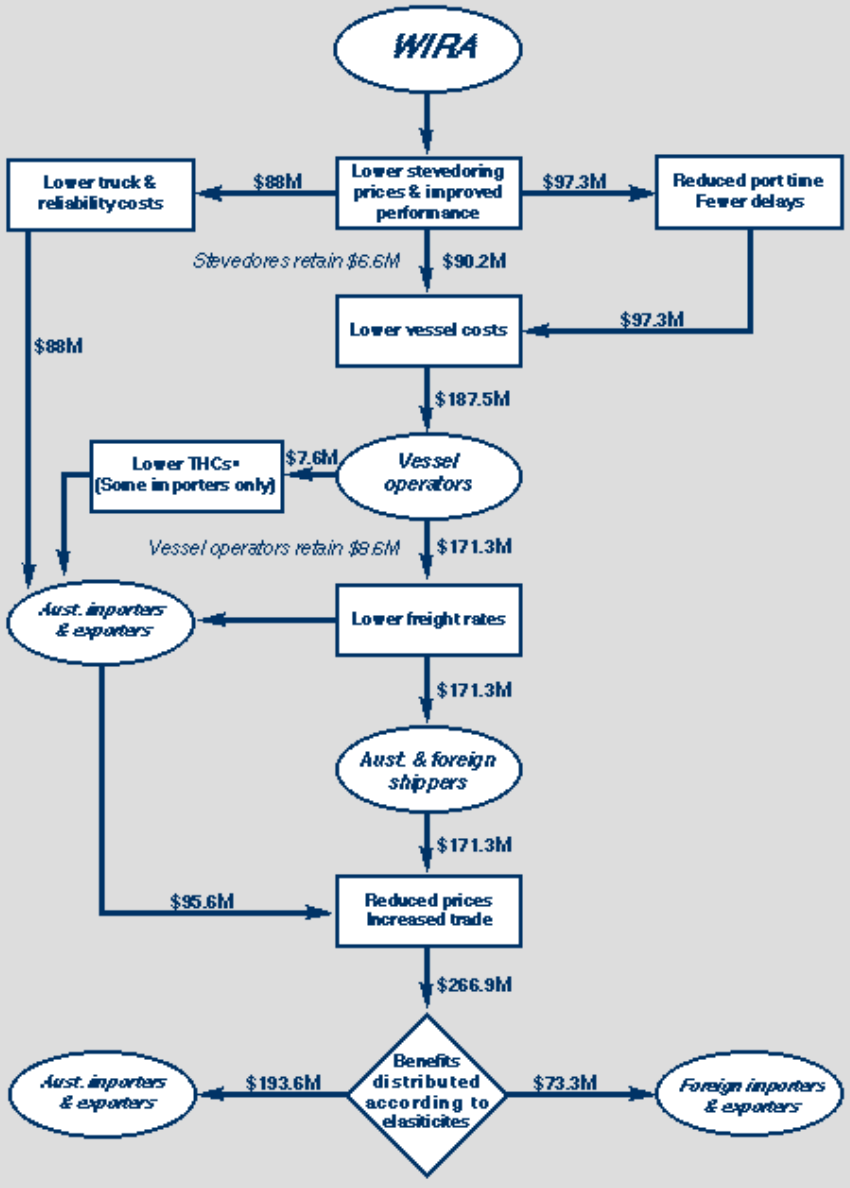
*($ million)*

| *Savings category* | *Total benefit* | *Distributed to* | |
|---|---|---|---|
| | | *Australians* | *Foreigners* |
| **Containerised cargoes** | | | |
| Imports | 134.5 | 104.9 | 29.6 |
| Exports | 98.1 | 63.7 | 34.2 |
| Sub-total | 232.6 | 168.7 | 63.9 |
| **Non-containerised general cargoes** | | | |
| Imports | 20.0 | 15.6 | 4.4 |
| Exports | 14.3 | 9.3 | 5.0 |
| Sub-total | 34.3 | 24.9 | 9.4 |
| **Non-bulk cargoes: container and non-container** | | | |
| Imports | 154.5 | 120.5 | 34.0 |
| Exports | 112.4 | 73.0 | 39.3 |
| Sub-total | 266.9 | 193.6 | 73.3 |
| **Bulk cargoes** | | | |
| Grain | 8.3 | 5.4 | 2.9 |
| Fertilisers | 0.7 | 0.7 | 0.0 |
| Sub-total | 9.0 | 6.1 | 2.9 |
| **Total** | 275.9 | 199.7 | 76.2 |

*Note* 1. Figures may not add to totals, due to rounding.

*Source* BTCE estimates based on appendix tables I.1, I.3, I.4, III.5.

**FIGURE 4.3 DISTRIBUTION OF CONTAINERISED AND NON-CONTAINERISED GENERAL CARGO BENEFITS (EXCLUDING BULK CARGO BENEFITS), 1993**




a. THC—terminal handling charges.

*Sources* Table I.4, figure 4.2, appendices II and III.

BTCE

# CHAPTER 5 CONCLUSIONS

This chapter summarises the main findings of the study, bearing in mind the key issues enumerated in the terms of reference. These terms of reference encompassed:

- the nature of the reforms
- the size and age distribution of the workforce
- the change to enterprise-based employment to get a more motivated and competitive industry
- new job structures and training programs to create a more flexible workforce
- changes in productivity, efficiency, cost and reliability
- the flow-through of the benefits of reform
- whether benefits are being maintained

## LABOUR REFORM

The Government's waterfront reform program has yielded uneven results in the reform of the stevedoring labour force. However, in reducing the size of the workforce the WIRA process was a great success. Voluntary redundancies reduced the workforce by 57 per cent.

Although the present workforce is definitely younger, limited recruitment has left the workforce still middle-aged. There are few workers under 30 years of age. Present idle time levels, and low levels of casual employment, indicate that the number of permanent full-time workers in the industry is still too high in some areas.

**Enterprise-based employment**

The EA system implemented during the WIRA process is continuing to evolve but, to date, has been more effective in the smaller ports.

In most ports outside Sydney and Melbourne the EA system has contributed to the development of a company ethos. As companies and their respective labour forces refine their EAs, further gains in labour productivity and efficiency can be expected.

In Sydney, Melbourne, and a small number of minor ports where labour competition is weaker, attitudinal change has been slower to develop. Stevedoring employees believe that their jobs are secure irrespective of the success of the company: cargo will continue to flow through these ports and stevedoring labour will have to load or unload it. Competition from other labour sources is unlikely, thus reducing the perceived need for change.

The 'closed shop' nature of waterfront employment and the industry-wide employment arrangements that existed prior to the WIRA reforms encouraged workers to give primary loyalty to the union rather than to the stevedoring company employing them. In some ports a change in the workers' primary loyalty to the company employing them, rather than to the union, has been slow to develop.

The attitudes of management have been formulated over the long period of mistrust on the waterfront that had moulded employees' attitudes. Both sides need to work at developing an environment of trust to allow further mutual gains in labour arrangements to be negotiated.

**Labour rigidity**

Although by early 1994 flexibility had improved, the industry still had a major problem in the mix of overtime, idle time and casual employment relative to the size of the permanent labour force. It was true that the use of casual (supplementary) labour was higher than in the pre-reform period. However, continuing restrictions on the use of casuals added unnecessarily to stevedoring costs.

The outcome of the second round of EAs should result in significant improvements to labour flexibility. The introduction of guaranteed wage employees and AVC trainees provides employers with greater flexibility in the rostering of workers. The greater flexibility should allow

reductions in both overtime and idle time. Agreements to abolish the pre-existing casual list comprising mostly ex-industry employees and the recruitment of a new group of casual employees should ensure the availability of a more effective supplementary workforce.

The AVC trainee scheme, largely developed as a MUA initiative, has the potential for providing the industry with a steady supply of well-trained younger recruits. In the long term, recruits from the trainee scheme will assist in the reduction of the average age of the stevedoring workforce.

Although the initiatives flowing from the second round of EAs should provide another step up in labour flexibility, it is important that employers and unions continue to work together to further improve labour efficiency. One area requiring attention is the development of more effective productivity incentive schemes.

**Compulsory redundancies**

Retrenchment of surplus employees is much more difficult than envisaged in the IPA in the major ports of Sydney and Melbourne, and in a few minor ports. However, in other ports, bulk terminals and container depots (generally those where there is some form of competition between labour and/or unions), compulsory redundancy as a last resort is more readily achieved.

Rather than retrenchments the MUA would prefer some industry-based arrangement to adjust the size of the workforce between stevedores as relative demands change. However, the employers treat such an approach with scepticism and suspicion, fearing a return to the old industry-based employment arrangements.

**Industrial disputes**

The WIRA process, through rationalising the number of unions and awards, has led to a marked decrease in demarcation disputes and rolling stoppages. During the WIRA process, ship delays caused by industrial disputes dropped by roughly two-thirds, despite the relative number of work hours lost remaining high. However, the level of industrial disputes is still high in comparison with other industries, and the most recent data appear to display a rising trend.

**Multi-skilling and career development**

Multi-skilling has emerged as an important success of the WIRA process, although much more can be done in this area. Multi-skilling has had a positive effect on productivity and efficiency of the labour force. The new skill classification levels appear to be working well.

Training for multi-skilling is well under way. Most companies at present are concentrating on enlarging the skill base of their workforce, especially within an employee's work area. While some companies have extended multi-skilling across several areas, such as clerical and operations, others do not appear to be doing as much, particularly with regard to the lower skill levels.

The introduction of multi-skilling into maintenance areas and the training of maintenance staff to do work in other areas has not progressed as well. Some companies expressed a view that these skills do not mix. However, evidence from some IPLF ports suggests that such multi-skilling is indeed possible.

In bulk terminals multi-skilling and consequential staffing reductions have resulted in large productivity improvements. Work practices are now much more consistent with efficient operational requirements, with each terminal evolving differently, depending on local conditions.

Career development path strategies are presently being pushed by the MUA, and stevedores are starting to do some career development training. With the present need to train existing staff in more skills, companies are putting a relatively low priority on developing a career structure for their waterside labour, and are giving greater priority to in-house training. This has hampered the MUA in introducing its trainee scheme to the industry although achievement of the target of 200 trainees by September 1995 appears possible.

Once companies have completed their present skill catch-up phase, employers have indicated that they will be showing far more interest in providing training suitable to allow stevedoring labour to move up the classification grades.

**Contracting of maintenance**

In some ports stevedoring employers are now able to put maintenance work out to contract. This practice, though, is mainly limited to ports

where the amount of maintenance work available is well below that required to keep normal maintenance staff fully employed. The MUA is still opposed to the practice of contracting out maintenance work, particularly to companies that do not employ MUA labour. The issue of using contract labour to carry out maintenance work has the potential to be a source of future industrial problems.

### Regional ports

Despite the reduction in the stevedoring workforce overall, there still appear to be high levels of idle time in some regional ports which have separate stevedoring workforces. As well, some regional stevedoring workers were reported to have incomes that were little better than the unemployment benefit. In the longer term it seems unlikely that a skilled workforce can be retained under such conditions.

This suggests that some degree of integration would be helpful in reducing overall waterfront costs in regional ports, as well as enhancing employee satisfaction by providing an assured income and a variety of work.

## EFFICIENCY, PRODUCTIVITY AND RELIABILITY

There have been substantial improvements in efficiency, productivity and reliability in Australian stevedoring since the inception of the WIRA process. In general, it appears that the gains made during the WIRA period were maintained until late 1993. There are, however, indications of a significant deterioration in performance in recent quarters, particularly in Sydney and Melbourne. It is probably too early to say whether this represents a continuing adverse trend. Ongoing monitoring will be required.

## LOWER COSTS AND IMPROVED QUALITY OF SERVICE

### Overview

Stevedores have achieved lower costs through reducing the workforce and increasing the productivity of those remaining. The low level of recruitment during the WIRA process, and since, indicates that

productivity gains have exceeded expectations. For the most part the cost reductions have been passed on to users of stevedoring services.

Ship operators have benefited from both the lower prices offered by stevedores and the improved quality of service they are now able to provide. Ships now spend on average significantly less time in port than before the reform program was commenced.

Although there have been improvements in the cost of handling breakbulk cargo, and in the quality of service breakbulk ship operators receive, the most significant improvements have occurred in container and bulk terminals.

**Breakbulk cargo stevedoring**

The cost structure of breakbulk cargo operations does not provide the same incentives for stevedores to capture market share as in container operations. The normal practice is for stevedoring contracts for breakbulk cargo to be negotiated on a cost-plus basis. Although the diverse nature of the cargoes and uncertainty in the quality of cargo stowage are sound arguments for cost-plus contracts, the fact remains that they diminish the incentive for improving productivity and lowering costs.

Nevertheless, although performance improved during the WIRA period, anecdotal evidence suggests that breakbulk stevedoring costs and quality of service did not improve during 1993 and, for some ship operators, breakbulk stevedoring performances deteriorated.

**Container cargo stevedoring**

In container operations, crane rates improved substantially during the WIRA process. Crane rates in the major ports were close to 20 teus per hour during late 1992, and for most of 1993. Changes to employment conditions have led to fewer delays to ships while at berth. The combined result has been a significant improvement in ship turnaround time at container terminals.

However, there was some deterioration in performance during late 1993 and early 1994. Melbourne experienced the largest decline, mostly as a result of increased industrial disputation in the latter part of 1993, and because of a major redevelopment at the Conaust terminal.

### Pricing

Rivalry between Conaust and AS has contributed to price reductions for container ship operators. The cost structure of container terminals is one of declining average costs. Improvements in productivity resulting from the reforms have, in effect, created excess capacity in most container terminals. Under these conditions, a terminal operator is better off if it can attract more business, as long as marginal costs are covered.

However, as terminal capacity is approached, increased business is not so attractive for terminal operators, and pressures for price increases can be expected.

### Scope for further cost reductions

PSA monitoring has shown that container terminal operating costs declined by 29 per cent between 1990 and 1993. Not all of the reduction in costs can be attributed to waterfront reform, as 20 per cent of the reduction is due to reductions in interest paid, rents and rates, and depreciation. The reduction in stevedoring costs due to waterfront reform is thus about 23 per cent.

With labour costs comprising 60 to 70 per cent of terminal costs (PSA, pers. comm.) and labour numbers reducing by 57 per cent, the reduction in stevedoring expenses would have been at least 34 per cent if there had been no change in unit labour or other costs. Although some increase in wage rates was expected, and did occur with the introduction of the Stevedoring Industry Award 1991, there appears to be scope for further reductions in stevedoring labour costs. Use of guaranteed wage employees and fewer double headers or overtime is now possible following the second round of EAs. The further relaxation of labour rigidities and increased integration of labour in regional ports would result in further significant reductions in labour costs.

In addition, the major capital improvements currently being implemented by Conaust and AS have the potential to increase productivity and reduce costs for waterfront users.

## DISTRIBUTION OF BENEFITS

Overall the benefits of the reforms have been substantial. The BTCE estimates that for 1993 the value of the benefits to shippers totalled $276

million. Of this total, about $200 million was retained by Australians and $76 million was captured by foreigners.

It should be noted, however, that there is considerable uncertainty as to the correct values of the elasticities of supply and demand, on which such calculations depend. As well, the BTCE did not attempt to estimate the benefits which may accrue, over time, from the increase in trade which could be induced by an improvement in the performance of Australia's waterfront.

Almost all of the benefits were passed on to shippers. A small amount was retained by stevedores in the handling of breakbulk cargo, and a similarly small amount was retained by ship operators.

The excess capacity in container terminals created by the reforms has facilitated the passing on of benefits. However, as container terminal volumes increase and individual terminals approach their capacities, the pressure to capture market share will diminish. The incentive to pass on future cost savings will correspondingly diminish, and price increases are likely to occur.

Similarly, freight rates are more likely to reflect savings in stevedoring costs during times of excess capacity in liner markets than when supply is tight.

## OVERALL ASSESSMENT OF WATERFRONT REFORM

Clearly waterfront reform has been successful in achieving substantial benefits for the waterfront industry and its customers. However, the results are not uniform across the industry. There are signs that perhaps some of the improvements in performance are being lost, and ongoing monitoring may be required. Changes negotiated in the second round of EAs suggest that significant reductions in labour costs are probable. The positive outcomes of the second round of EAs are a hopeful sign of continuing improvement from future rounds of EA negotiations.

## SUMMARY OF FINDINGS

Concerning labour reform, the WIRA process has:

- Provided a smaller (down 57 per cent) and younger (10 years younger) workforce, by voluntary redundancies.

  - By the end of the WIRA process the age structure had improved, shifting the median age from 50-plus to 40- to 50-year-olds. However, without recruitment of younger employees the age structure could easily have returned to 50-plus in just over a decade, with over 50 per cent of the workforce due for retirement (at 65) in 15 to 25 years.
  - Recruitment of new and younger employees in conjunction with the second round of EAs and the development of the AVC trainee scheme will further reduce the median age.
- Reduced the number of unions involved in stevedoring from eight to three, with some smaller ports, bulk terminals and depots having only one union involved.
  - However, the MUA has considerable power and has been effective in keeping wages and conditions high.
- Introduced an industry-wide award, replacing 21 different awards.
- Allowed companies and their workers to develop a company ethos, although in many instances it is still very weak, particularly in the major ports.
  - The EA system is functioning, and will continue to provide long-term benefits, both to the industry and to Australia. The present EA system should, over time, resolve many of the remaining issues. The second, and subsequent, rounds of EA negotiations should bring about further change, making the industry more dynamic and competitive.
  - Industrial disputes per employee are just as high as in pre-WIRA days. However, the effect on shipping is not as great as previously, as with fewer unions on the waterfront more of the time lost is in simultaneous, rather than consecutive, stoppages.
- Facilitated the acceptance by workers in most minor ports, depots and bulk terminals that compulsory redundancy as a last resort might be necessary.
  - But in the ports of Sydney and Melbourne, and in a minority of minor ports, compulsory redundancy of surplus employees as a last resort is much more difficult to achieve than envisaged in the IPA.
- Allowed, via multi-skilling, the workforce to be deployed much more efficiently, particularly in bulk terminals.

- Allowed better allocation of tasks and labour on an 'as needs' basis.
  - Although flexibility in the types of labour that are available (that is, casuals versus overtime) is greater than pre-WIRA, there are still too many constraints on the types of labour used, on when they work and on the hours they work.
- Developed a career structure for workers within the industry.
- Brought about a more flexible and dynamic training system, which has the potential to meet the demands of the industry and the companies within it.
  - This has also produced a safer work environment.
- Reduced idle time by half from 26 per cent (June 1991) to 13 per cent (December 1993).
- Allowed the integration of port and stevedoring labour forces to occur in regional ports with low utilisation in WA, Burnie, Geelong and Darwin, producing large savings in costs and reductions in idle time.
- Allowed companies in some ports to use contract maintenance staff.

Regarding the benefits of waterfront reform to users:

- Container crane productivity increased by 50 per cent, and net ship working rates by 64 per cent, during the WIRA process.
  - However, the levels of the current shift and overtime allowances tend to work against the effects of present incentive schemes.
- For bulk cargoes, labour productivity improved by about 60 per cent over the WIRA period, and appears to have improved further since.
- For non-containerised general cargo stevedoring, tonnes per person-shift doubled during the WIRA period for dry cargoes, and increased by about 70 per cent for refrigerated cargoes. Quality of service has improved in some cases.
- The national average cost to the stevedore of loading or unloading containers was reduced by $76 per teu or 29 per cent between 1990 and 1993.
- Container stevedoring prices paid by vessel operators decreased by a national average $61 per teu or 24 per cent between 1990 and 1993. Vessel turnaround times have also improved.

- Competitive pressures in liner shipping have ensured that vessel operators have passed forward to shippers most of the savings they have achieved from reductions in stevedoring prices.
  - Reductions in freight rates have exceeded the reductions in stevedoring charges in most trades.
  - Reductions in terminal handling charges (where these apply) have reflected reasonably well reductions in stevedoring charges.
- The BTCE estimates that the value of the benefits to all shippers in 1993 totalled $276 million.

# APPENDIX I THEORETICAL ANALYSIS OF DISTRIBUTION OF BENEFITS

Who ultimately benefits from waterfront reform does not depend on which party initially benefits. The degree of market power in each of the sectors in the export and import chain influences how transport costs are passed forward. Conditions in the markets for the traded goods determine how the benefits of reform are distributed between Australians and foreigners: the final beneficiary may be very different from the initial beneficiary.

The effect of waterfront reform is to reduce transport costs and improve quality of service provided in the transport of Australian imports and exports. The lower transport costs and improved service quality increase the demand for traded goods transported by sea. The benefits of the increased trade are shared between Australian and foreign importers and exporters.

## DIRECT EFFECT OF WATERFRONT REFORM ON SHIPPERS AND SHIP OPERATORS

Figure I.1, which is based on a BTCE (1993a) analysis of aviation reform, illustrates the effect of stevedoring industry reform. Although the contractual arrangements are normally between stevedores and ship operators for the supply of stevedoring services,[1] stevedoring demand is more adequately measured in terms of cargo volume than numbers of ships serviced. The volume of cargo will, with all other things held constant, depend on the quality of service provided by the stevedore and on stevedoring prices (assuming for the moment that stevedoring prices are passed through in full to freight rates and cif prices).

---

1. In bulk shipping, where the one shipper contracts for the use of the whole vessel, there is often a direct transaction between shipper and terminal operator.

In figure I.1, the demand for Australian waterfront services prior to waterfront reform is represented by DD. The supply of waterfront services is represented by SS and the equilibrium price is P, with quantity Q traded.

After waterfront reform, improvement in Australian waterfront quality of service effectively reduces the cost of Australian exports to overseas buyers and the cost of overseas goods to Australian importers. This induces an increase in the flow of goods into and out of Australia. Accordingly the demand for stevedoring services is greater than previously at any given price. The demand curve shifts out to D*D*. At the pre-reform price of P, the volume of cargo and demand for stevedoring services increases to Q*.

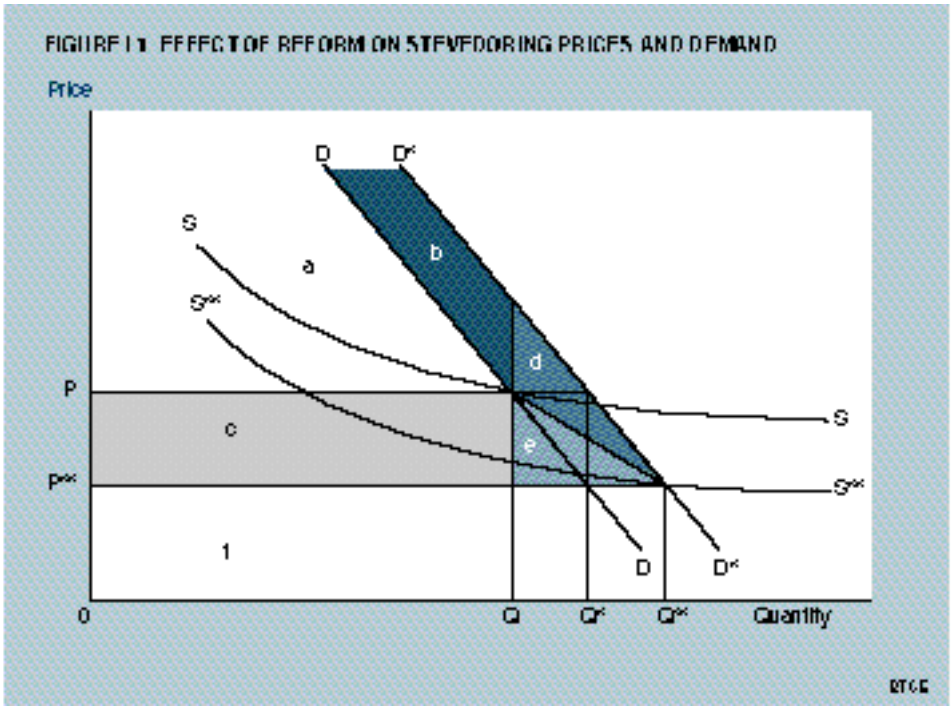
However, with lower production costs following waterfront reform the supply curve shifts down to S**S**.[2, 3] This results in a further potential increase in quantity to Q** provided at price P**. The extent of the increase from Q* to Q** depends on the extent to which the reduction in stevedoring prices is passed through to freight rates and eventually to the prices of the traded goods.

Prior to waterfront reform, the consumers' surplus of shippers is represented by area a in Figure I.1. This is the difference between the sum of the maximum amounts the shippers would have been prepared to pay for all units up to Q and what they actually did pay (which is area *c* plus area *f* ).

After waterfront reform, the shippers of the previous amount, Q, gain from the increased quality of service by an increase in their consumer surplus represented by area *b*.

---

2. Ship operators are obliged to pay the Statutory Tonnage Levy to finance the stevedoring industry's redundancy payments. The supply curve S**S** is inclusive of these levy payments.
3. The supply curves shown in figure I.1 are representative of container terminals which are characterised by high fixed costs. Prior to reform, labour costs also had a large fixed component. The average cost and marginal cost curves both fall with increased output until congestion occurs. Performance monitoring of the waterfront has generally shown that in recent years the waterfront has exhibited spare capacity rather than congestion. Under these conditions prices must at least equal average costs to sustain continued operation. PSA stevedoring price monitoring indicates that over the period monitored stevedoring prices have generally been close to average costs. The supply curves in figure I.1 can then be interpreted as average cost curves.




Area c is a transfer from the producers of waterfront services, initially to ship operators. Part of this transfer is recouped by the stevedores through increased productivity of existing resources. The productivity improvement is a welfare gain to the economy. The balance of the transfer is comprised of a loss of profits to the stevedoring companies and a loss of factor rents to labour through more stringent working conditions, although there is no evidence from the monitoring of stevedoring costs and revenues to suggest that stevedoring operators were earning any economic rents prior to the reforms.

Following reform, waterfront labour remaining on the waterfront received higher wages through incentive payments and payments for increased skills. For those workers it is debatable whether any factor rents earned prior to the reforms have been diminished. Workers leaving the industry generally did so voluntarily, suggesting that those leaving were made better off. The net result may, therefore, be no noticeable effect on profits or loss of factor rents to labour.

Most ship operators carrying Australian imports and exports are foreign owned. Thus any reduction in stevedoring rates not passed through to lower freight rates will be a loss to national welfare.

The Commonwealth Government contributed $165 million to redundancy payments for those workers leaving the industry. These payments are a transfer from taxpayers to those made redundant. In a partial equilibrium analysis such as this, it is not possible to estimate the welfare effects of the transfer, but the effect is unlikely to be large.

The shippers of the increased amounts of exports and imports (Q**– Q) following waterfront reform realise a consumer surplus equal to area *d* plus area *e*. Area *e* represents net consumer surplus to shippers who have been successful in increasing exports or imports because of the reduction in waterfront costs. Area *d* represents net consumer surplus to shippers who have been successful in increasing exports or imports because of the improvement in waterfront quality of service.

The net welfare gain of the reforms can be considered in two parts. The first part is the reduction in stevedoring prices and is represented by areas *c* plus *e*. Because the demand for stevedoring services is a derived demand, the elasticity of demand is small. Consequently the area *e* will be small relative to area *c*.

The second part, equal to areas *b* plus *d*, is due to improved quality of service. Again the area *d* is likely to be small relative to area *b*.

If vessel operators were to capture a proportion of the stevedoring cost reductions due to waterfront reform, this would be equivalent to a smaller downward shift in the stevedores' supply curve having occurred. The effective price to shippers, although lower than P, would be higher than P**, and the quantity traded would be less than Q**, although still higher than Q*.

## RESPONSE OF SHIP OPERATORS TO WATERFRONT REFORM

As already seen, vessel operators initially gain from waterfront reform through reduced stevedoring prices and improved quality of service. The improved quality of service reduces ship operating costs principally through faster turnaround times. How liner operators respond to changed operating costs is a critical issue in the distribution of the benefits of waterfront reform.

Liner shipping markets are the main focus of attention. Bulk shipping markets affected by stevedoring reform are mostly those involving grain exports. Bulk ships carrying grain are largely chartered in markets noted for their competitiveness.

The most comprehensive theoretical analysis of conference pricing practices in recent times is that of Harvey (1993) for the Review of Part X of the *Trade Practices Act*. In his analysis, Harvey examined three models of conference pricing. Each of these models is based on an assumed market behaviour: price discriminating monopolist, participant in a highly contestable market and participant in an open cartel.

**Price discriminating monopoly model**

Conferences have a degree of monopoly power because their quality of service, especially frequency, gives them a degree of product differentiation from non-conference lines. Conference operators use this monopoly power to practise third-degree price discrimination (that is, different prices are charged to different sub-markets).

The monopolist's profit-maximising set of prices is given by:

$$(P_i - MC_i) \,/\, P_i = 1 \,/\, \eta_i \text{ for all sub-markets } i$$

where: $P_i$ = price;

$MC_i$ = marginal cost; and

$\eta_i$ = price elasticity of demand.

Higher valued cargoes tend to be charged higher freight rates, as their elasticities of demand for transport tend to be lower than those for lower-valued cargoes. This exercise of market power via price discrimination results in higher profits to liner operators. As a result, there is a transfer of welfare from Australian consumers to largely foreign-owned liner vessel operators.

Harvey concluded that it is not clear whether discriminatory pricing or non-discriminatory monopoly pricing was preferable, in terms of Australian welfare. It was very likely to be true that price discrimination allowed some cargoes to travel that would not otherwise do so.

**Contestable market model**

Contestability theory holds that the existence of certain conditions, to do with the ease of entry and exit from a market, may induce monopoly or oligopoly producers to price their output competitively, because of the threat of potential new entrants.

If potential new entrants can adopt the same production techniques and face the same market demand, if there are no legal impediments to entry or sunk costs upon exit, and existing producers cannot instantly adjust their prices in reaction to a new entrant, then the market is perfectly contestable. Under these conditions production would be at minimum cost and pricing would be without cross-subsidisation. The pricing by the conference would be such that no supernormal profits are earned as these would attract entry from non-conference lines. Perfect contestability is, however, a theoretical construct, in much the same way as is perfect competition. Real markets may be contestable to some lesser degree.

There are different views on how well some of the key conditions for a contestable market apply to liner shipping. These conditions are the scale of entry, existence of sunk costs, and price sustainability.

### *Scale of entry*

One view is that a large-scale entry is required to provide a service equivalent to that provided by a conference. The required scale is a barrier to entry. The alternative view is that entry at a lower level of service is possible. Such entrants would target less time sensitive cargoes and charge lower freight rates. There are a range of possible small-scale entry strategies providing a partial substitute for conference services. These small-scale competitors place constraints on conference price levels for the competitive cargoes (Harvey 1993, p.29).

### *Sunk costs*

Although the fixed costs of a ship are high, ships are easily moved from one market to another. If there is commonality between markets the sunk costs are likely to be small.

In the Australian context there is a high reefer component in some export trades. Existing operators employ ships built to satisfy the specific needs of these trades. Potential entrants wishing to avoid sunk costs would find it difficult to compete in reefer sub-markets or other markets requiring specialised equipment.

The degree of contestability probably varies across sub-markets. However, even reefer markets are not totally protected against potential entry. For example, a report in the *Daily Commercial News* commented

that the relative stability on the North American route is ending. FESCO was re-establishing its presence, two Scandinavian carriers were attempting to increase their share of the meat trade and transhipment operators were said to be aggressively seeking part of the trade (*DCN* 1994c). In addition, a new entrant is challenging existing operators on the New Zealand to North America meat trade (*DCN* 1994b).

### *Price sustainability*

In contestable markets, incumbents are slow to adjust prices in response to new entrants. The slow response allows new entrants to capture some market share before the incumbent is able to adjust prices in retaliation.

Harvey (1993) concluded that the Australian liner trades are reasonably contestable, especially for lower valued cargoes. However, Harvey was of the opinion that existing non-conference competition, rather than the potential for new entrants, may be the main source of downward pressure on liner freight rates in the Australian trades.

### *Open cartel model*

Harvey (1993) considered that the open cartel model was the only one consistent with conferences earning low profits, practising price discrimination, and charging freight rates on some cargoes that are below long run marginal costs.

In an open conference (that is, the Australia – North America trades), while initially prices are set above costs, costs rise to the level of prices because the entry of new lines creates excess capacity, and lines compete on the basis of quality of service in order to increase their market shares.

At any level of capacity, profits are maximised when marginal revenue equals short-run marginal cost. The higher the elasticity of demand the closer marginal revenue is to the freight rate. When the short-run marginal cost is less than the long-run marginal cost, it is thus possible for freight rates to also lie beneath long-run marginal costs for commodities with a high elasticity of demand.

While the model is particularly suited to open conferences it may also be applicable to closed conferences. If an entrant non-conference line wins sufficient market share, the conference may invite the non-conference line to join the cartel.

### Conclusion

Harvey (1993) concluded that the situation in the Australian liner trades was best explained by a dynamic interaction of all three models.

## INCIDENCE OF FREIGHT CHARGES

The distribution of the benefits of lower transport costs and increased trade following waterfront reform depends on the incidence of freight costs. The greater the proportion of freight costs borne by Australian importers and exporters, the greater the proportion of benefits retained in Australia.

The incidence of freight charges refers to the relative burden of freight costs ultimately borne by the exporter in one country and the importer in the other, as distinct from the question of which party paid the freight bill in the first instance. The latter depends only on whether goods are purchased on a free-on-board or a cost-insurance-freight or cost-and-freight basis. The incidence will be determined by the relative elasticities of demand and supply for Australian exports or imports. For example, the more elastic the demand for Australia's exports, other things being equal, the higher the share of freight costs ultimately borne by the Australian exporter.

The incidence of freight charges borne by the exporter is given by the formula (Cassidy 1982):

$$I_{ex} = \frac{|E_d|}{E_s + |E_d|}$$

where: $E_d$ = own price elasticity of demand; and

$E_s$ = elasticity of domestic supply of exports.

The incidence of freight charges borne by the (overseas) importer is given by:

$$I_{im} = 1 - I_{ex} = \frac{E_s}{E_s + |E_d|}$$

An analogous formulation provides the incidence for Australian imports.

Values of elasticities are subject to debate among economists, and thus similarly are values for incidence. Harvey (1993) reported incidence estimates of Cassidy (1982) and BTE (1986). Cassidy estimated the incidence on Australian exporters as being 63 to 77 per cent, and on importers as 80 to 92 per cent. BTE (1986) estimates were 47 to 71 per cent for exports and 50 to 80 per cent for imports. Harvey (1993) considered the BTCE (1986) estimates to be very conservative. BTCE (1990) estimates implied 44 to 67 per cent for exports, but made no estimates for imports.

In this present analysis, export demand elasticities published by Dee (1994) and export supply elasticities in BTCE (1990) are used. These are shown in table I.1, together with 1992–93 export values for exports carried by liner shipping. The Australian incidence of transport costs was calculated for each commodity classification. The weighted average of these separate estimates of Australian incidence was 65 per cent.

Own-price elasticities of import demand were more difficult to estimate. Two sources were used. Dee (1994) published estimates, for a range of commodities, of cross-price elasticities of demand for imports with respect to the price of domestic goods. Menon (1993) published the elasticity of demand for imported goods with respect to the relative price

**TABLE I.1 PRICE ELASTICITIES OF EXPORT SUPPLY AND DEMAND**

| *ATFCC* | *Classification* | *Exports ($ millon)* | *Demand elasticity* | *Supply elasticity* |
|---|---|---|---|---|
| 0 | Food and live animals | 2 483 | –4.3 | 2.0 |
| 1 | Beverages and tobacco | 33 | –6.0 | 2.0 |
| 2 | Crude materials | 2 380 | –4.6 | 2.0 |
| 3 | Mineral fuels | 34 | –4.7 | 5.0 |
| 4 | Animal and vegetable oils | 24 | –4.2 | 2.0 |
| 5 | Chemicals | 207 | –3.7 | 10.0 |
| 6 | Processed materials | 831 | –5.8 | 2.0 |
| 7 | Machinery and transport equipment | 681 | –7.7 | 10.0 |
| 8 | Miscellaneous manufactures | 195 | –5.3 | 10.0 |
| 9 | Other | 984 | –4.4 | 2.0 |
| | Weighted average | 7 852 | –4.9 | 3.1 |

*Sources* BTCE (1990); Dee (1994); ABS SACCS data.

of domestic competing goods. Menon's elasticities were estimated for a range of manufactured goods.

The own-price elasticity of demand may be calculated from these elasticities as follows:

Let $Q$ = quantity of an import good sold domestically;

$P_i$ = tariff augmented import price of $Q$;

$P_j$ = price of domestic competing commodity;

$P = P_i / P_j$ = relative price of import with respect to domestic competition; and

$\varepsilon_{Q,P}$ = elasticity of demand for imported goods with respect to relative price of domestic competition

$$\varepsilon_{Q,P} = \frac{\partial Q}{\partial P} \cdot \frac{P}{Q}$$

$$\text{where } \partial P = \partial\left(\frac{P_i}{P_j}\right) = \frac{P_j \partial P_i - P_i \partial P_j}{P_j^2}$$

Substituting gives:

$$\varepsilon_{Q,P} = \frac{\partial Q\, P_j}{P_j \partial P_i - P_i \partial P_j} \cdot \frac{P_i}{Q}$$

$$\frac{1}{\varepsilon_{Q,P}} = \left(\frac{P_j \partial P_i}{\partial Q\, P_j} - \frac{P_i \partial P_j}{\partial Q\, P_j}\right)\frac{Q}{P_i}$$

$$= \frac{\partial P_i\, Q}{\partial Q\, P_i} - \frac{\partial P_j\, Q}{\partial Q\, P_j}$$

$$= \frac{1}{\varepsilon_{Q,P_i}} - \frac{1}{\varepsilon_{Q,P_j}}$$

That is, the inverse of the relative price elasticity of demand for the imported good will be equal to:

- the inverse of the own-price elasticity of demand for the imported good, less
- the inverse of the cross-price elasticity of demand for the imported good with respect to the price of the domestic good.

Table I.2 shows the calculations for the commodities listed in Menon (1993), using Menon's relative price elasticities and Dee's cross-price

**TABLE I.2 CALCULATION OF PRICE ELASTICITIES OF DEMAND FOR IMPORTS**

| *AICC No.* | *Commodity* | $\varepsilon_{Q,P}$ | $\varepsilon_{Q,P_j}$ | $\varepsilon_{Q,P_i}$ |
|---|---|---|---|---|
| 51 | Organic chemicals | –0.25 | 1.3 | –0.31 |
| 52 | Inorganic chemicals | –1.69 | 2.5 | –5.22 |
| 53 | Dyeing, tanning materials | –0.36 | 1.3 | –0.50 |
| 54 | Medicinal pharmaceutical prods. | –0.50 | 1.3 | –0.81 |
| 55 | Essential oils | –0.28 | 1.3 | –0.36 |
| 58 | Artificial resins, plastics | –0.44 | 1.3 | –0.67 |
| 59 | Chemical materials and products | –1.40 | 2.3 | –3.58 |
| 61 | Leather, leather manufactures | –1.43 | 2.7 | –3.04 |
| 62 | Rubber manufactures | –1.16 | 2.7 | –2.03 |
| 63 | Cork and wood manufactures | –0.43 | 2.3 | –0.53 |
| 64 | Paper, articles of pulp paper | –0.28 | 1.3 | –0.36 |
| 65 | Textile yarn, fabrics | –0.24 | 1.4 | –0.29 |
| 66 | Non-metallic minerals | –0.59 | 2.2 | –0.81 |
| 67 | Iron and steel | –1.30 | 2.5 | –2.71 |
| 69 | Manufactures of metal | –0.36 | 2.4 | –0.42 |
| 71 | Power generating machinery | –1.06 | 2.2 | –2.05 |
| 72 | Specialised machinery | –0.40 | 1.3 | –0.58 |
| 74 | General industrial machinery | –0.96 | 1.3 | –3.67 |
| 75 | Office machines, ADP equipment | –1.35 | 2.5 | –2.93 |
| 76 | Telecommunications equipment | –0.77 | 1.3 | –1.89 |
| 77 | Electrical machinery and parts | –0.41 | 1.3 | –0.60 |
| 78 | Road vehicles | –0.48 | 3.3 | –0.56 |
| 81 | Sanitary, heating equipment | –0.94 | 1.3 | –3.39 |
| 82 | Furniture and parts thereof | –0.43 | 1.3 | –0.64 |
| 84 | Apparel, clothing accessories | –1.00 | 2.9 | –1.53 |
| 85 | Footwear | –1.75 | 2.7 | –4.97 |
| 87 | Professional, scientific equipment | –0.57 | 1.3 | –1.02 |
| 88 | Photographic, optical equipment | –0.36 | 1.3 | –0.50 |
| 89 | Miscellaneous manufactures | –0.60 | 1.3 | –1.11 |

*Sources* Menon (1993); Dee (1994).

elasticities of demand. Some judgement was required in aligning the commodities listed in Dee (1994) with those of Menon (1993).

Weighted average own-price elasticities of demand for each of the major groups of manufactures (AICC 50–59, 60–69, 70–79 and 80–89) were calculated. These are roughly the same as the equivalent groups in the ATFCC classifications. Supply elasticities were assumed to be the same as for exports, except for mineral fuels, for which a value of 2 was used. Imports in this group are mainly oil products, whereas exports in this group are mainly coal and coke.

Manufactured goods in ATFCC categories 5, 6, 7 and 8 comprise about 84 per cent by value of goods imported in liner ships. Although no precise estimates of own-price elasticities of demand were estimated for goods in other ATFCC categories, the overall weighted average was not very sensitive to whatever plausible values were chosen for these non-manufacture categories. The elasticities chosen for each of the ATFCC categories are shown in table I.3.

The overall incidence borne by Australians for imports carried by liner ships was estimated to be 78 per cent.

The foregoing has concentrated on the transport incidence of goods carried by liner shipping. However, waterfront reform also conferred benefits to bulk transport, principally for grain exports. The elasticities in group 0 in table I.1 may be used to estimate the Australian incidence of the transport costs of carrying grain as 68 per cent.

The proportion of transport costs borne by Australian exporters and importers is summarised in table I.4. These estimates are consistent with those estimates in the earlier works mentioned above.

**TABLE I.3 PRICE ELASTICITIES OF IMPORT SUPPLY AND DEMAND**

| *ATFCC* | *Classification* | *Imports ($ millon)* | *Demand elasticity* | *Supply elasticity* |
|---|---|---|---|---|
| 0 | Food and live animals | 620 | –1.50 | 2.0 |
| 1 | Beverages and tobacco | 158 | –1.50 | 2.0 |
| 2 | Crude materials | 366 | –1.50 | 2.0 |
| 3 | Mineral fuels | 42 | –0.50 | 2.0 |
| 4 | Animal and vegetable oils | 30 | –1.50 | 2.0 |
| 5 | Chemicals | 938 | –1.50 | 10.0 |
| 6 | Processed materials | 2 424 | –0.90 | 2.0 |
| 7 | Machinery and transport equipment | 4 181 | –2.00 | 10.0 |
| 8 | Miscellaneous manufactures | 1 678 | –1.00 | 10.0 |
| 9 | Other | 504 | –1.50 | 2.0 |
| | Weighted average | 10 941 | –1.50 | 7.0 |

*Sources* BTCE (1990, table I.3); ABS SACCS data.

**TABLE I.4 INCIDENCE OF TRANSPORT COSTS BORNE BY AUSTRALIANS**
*(Per cent)*

| *Trade* | *Imports* | *Exports* |
|---|---|---|
| Liner | 78 | 65 |
| Bulk grain | .. | 68 |

*Source* BTCE estimates based on tables I.1, I.2 and I.3.

# APPENDIX II BENEFITS TO STEVEDORES AND VESSEL OPERATORS

## BENEFITS TO STEVEDORES

Stevedores benefit from waterfront reform via the increased productivity flowing from the large reductions in the number of employees and the reform of work practices. The increased productivity results in lower operating costs per unit of cargo transferred. Improved work practices have also resulted in faster turnaround times for ships, which in turn has effectively increased the throughput capacity of the existing facilities.

Reductions in labour costs were the major benefits to the stevedores of the reforms.[1] Labour costs form the major part of stevedores' terminal costs (estimated at up to 75 per cent in PSA 1992b). Up to October 1992, labour numbers had decreased by 57 per cent (WIRA 1992b).

Other stevedores' costs have also decreased. The PSA (1994a) estimated, on the basis of a representative firm, that reductions in costs such as depreciation, rent and rates, administration and interest had contributed some 37 per cent to the decline in stevedores' average expenses per teu. Reductions in depreciation, rents and rates are unlikely to have any direct relationship to waterfront reform. However, the reduced size of the workforce would result in reduced administration costs. Deleting administrative costs from these other costs leaves about 20 per cent of the reduction in stevedores' costs as not related to waterfront reform.

---

1. WIRA (1992a) put the reduction in stevedoring wages and on-costs at more than $240 million per year. This is somewhat higher than the estimates in this appendix.

## Reduction in stevedores' costs

### *Containerised cargo*

The PSA (1994a) provides estimates for the national weighted average level of stevedores' expense per teu (as opposed to the price charged for stevedoring services, which is the cost to the vessel operator). The PSA estimated (see table II.1) that national average cost to stevedores[2] declined from $262 per teu in 1990 to $186 per teu in 1993, a reduction of $76 or 29 per cent.[3] The downward trend had slowed by 1993.

The reduction of $76 since 1990 would have generated savings to the stevedores of about $147 million in a full year, based on the 1992–93 level of 1.935 million teus (ATC 1993). However, perhaps $29 million of this decrease in stevedoring expense was due to those factors not directly connected with stevedoring reform: stevedores' rates and rentals, depreciation and amortisation, and interest costs.

**TABLE II.1 NATIONAL WEIGHTED AVERAGE STEVEDORING EXPENSE PER TEU**

| | *1990* | *1991* | *1992* | *1993* |
|---|---|---|---|---|
| Expense per teu ($) | 262 | 243 | 196 | 186 |
| Reduction per teu ($) | | 19 | 66 | 76 |
| Teus (million) | | 1.69 | 1.85 | 1.94 |
| Total reduction[a] ($ millon) | | 32.1 | 122.1 | 147.4 |

a. Compared with 1990.

*Source* BTCE estimates based on PSA (1994a,b), ATAC (1993) and ATC (1993).

2. The PSA series for national average stevedores' expenses per teu did not include interest charges for CTAL until the period July 1992 to June 1993.
3. Australian Stevedores' submission to the Part X Review provided figures for their costs per teu for their Sydney and Melbourne terminal operations. Before corporate overheads and interest charges, Australian Stevedores' average expenses declined from $269 per teu in 1989–90 to $195 per teu in the first six months of 1992–93, a reduction of $74 or 26 per cent (Australian Stevedores 1993).

### *Non-containerised general cargo*

WIRA data on changes in productivity for conventional stevedoring up to September 1992 show that tonnes per person-shift almost doubled for non-reefer cargoes, and increased by 70 per cent for reefer cargoes averaged over the five major ports (see table 3.4). However, the volume of conventional general cargo had more than doubled between 1989 and 1992, for both reefer and non-reefer cargoes (WIRA 1992b).

If the cargo volumes of the major ports in the September quarter 1992 had been handled at 1989 productivity levels, it would have taken about 30 500 person-shifts. In fact, at the improved productivity levels then obtaining, less than 14 000 person-shifts were used, a saving of some 16 500 person-shifts or almost 54 per cent.

These savings in the major ports are estimated to be worth about $15 million per year by 1992, based on the following assumptions:

- wages for a normal person-shift are $120;
- an average shift is paid at time-and-a-half; and
- overheads are 27 per cent of wages.[4]

Savings in conventional stevedoring would also have been made at regional ports, where non-containerised cargo is often a higher proportion of non-bulk cargo than in the major ports. Savings of around $3 million per year (or 20 per cent of the savings in the main ports) are a reasonable, if rough, estimate to attribute to conventional stevedoring in the regional ports. Total stevedoring cost savings for conventional cargo would thus have been around $18 million for 1992.

Later data are not available for conventional stevedoring, and the anecdotal data are somewhat mixed. However, a conservative approach is taken and 1993 savings are estimated as being $18 million, the same as in 1992.

---

4. PSA (1994a) estimates that reduction in administrative costs contributed 17 per cent to the reduction in stevedoring expenses. About 20 per cent of the total reduction was not related to stevedoring reform. The remaining savings, mostly labour costs, total about 63 per cent. Administrative expenses therefore represent 17/63 or 27 per cent of labour costs.

### *Bulk cargo*

On the basis of WIRA data, the BTCE estimates that 63 per cent fewer person-shifts were required to load grain in the first nine months of 1992 at prevailing productivity rates per person-shift than would have been required at 1990 productivity rates (see table II.2).

In the nine months to September 1992, the ports listed in table II.2 exported 6.19 million tonnes of grain. During 1991–92 a total of 10.4 million tonnes of grain were exported from Australia (BTCE estimates based on ABS 5424.0). On a pro rata basis 8817 person-shifts were saved during all of 1992. The person-shift savings would be worth an estimated $2.0 million in 1992, based on the same assumptions as used for non-containerised cargo.

However, data collected for the case study of grain ports (see appendix V) indicate that the increase in productivity per person-shift in 1993 was a further increase of about 30 per cent compared with 1992. Around 12.4 million tonnes of bulk grain were exported in 1992–93, giving savings of around $3.1 million.

Reductions in staffing have also been made for stevedoring other bulk cargoes, including fertilisers and alumina. Using the same method as for grains, it is estimated that almost 14 per cent fewer person-shifts were required to unload bulk fertilisers in the September quarter 1992 than would have been required at 1989 productivity rates. Savings, including on-costs, would be around $0.5 million per year by 1992 (BTCE estimates), and somewhat higher by 1993, probably about $0.7 million.

Overall savings to stevedores from the WIRA process in the area of bulk cargo shipping would be in the region of $3.8 million per year in 1993 (BTCE estimate).

### *Overall savings to stevedores*

In 1993, savings to stevedores from cost reductions due to reform in container stevedoring ($117.6 million), non-container general stevedoring ($18 million) and bulk stevedoring (almost $3.8 million) totalled approximately $140 million. Part of these savings has been used to overcome negative margins and part has been passed forward to vessel operators.

**TABLE II.2 STEVEDORING LABOUR SAVINGS IN GRAIN PORTS, 1992**

| Port | *Tonnes loaded in 1992 ('000)* | *Tonnes per person-shift* | | *Person-shifts at* | | *Person-shifts saved* |
|---|---|---|---|---|---|---|
| | | *1990* | *1992* | *1990 rate* | *1992 rate* | |
| Mackay | 13 | 2 403 | 3 128 | 5.41 | 4.16 | 1.25 |
| Pinkenba 1 | 24 | 443 | 142 | 54.18 | 169.01 | –114.84 |
| Pinkenba 2 | 50 | 519 | 453 | 9.63 | 11.04 | –1.40 |
| Fisherman Is. | 148 | 4 787 | 4 352 | 30.92 | 34.01 | –3.09 |
| Newcastle | 33 | 1 167 | 2 063 | 28.28 | 16.00 | 12.28 |
| Port Kembla | 285 | 4 187 | 6 961 | 68.07 | 40.94 | 27.13 |
| Adelaide[a] | 290 | 581 | 1 551 | 499.14 | 186.98 | 312.16 |
| | 105 | 376 | 1 458 | 279.26 | 72.02 | 207.24 |
| Port Giles[a] | 39 | 655 | 975 | 59.54 | 40.00 | 19.54 |
| | 137 | 450 | 1 195 | 304.44 | 114.64 | 189.80 |
| Wallaroo | 381 | 420 | 1 924 | 907.14 | 198.02 | 709.12 |
| Port Pirie | 318 | 443 | 1 293 | 717.83 | 245.94 | 471.89 |
| Port Lincoln[a] | 690 | 1 609 | 4 157 | 428.84 | 165.99 | 262.85 |
| | 153 | 792 | 2 468 | 193.18 | 61.99 | 131.19 |
| Thevenard | 175 | 443 | 1 591 | 395.03 | 109.99 | 285.04 |
| Esperance | 248 | 593 | 1 089 | 418.21 | 227.73 | 190.48 |
| Albany[a] | 616 | 947 | 2 001 | 650.48 | 307.85 | 342.63 |
| | 120 | 624 | 1 552 | 192.31 | 77.32 | 114.99 |
| Kwinana[a] | 1 823 | 763 | 2 500 | 2 389.25 | 729.20 | 1 660.05 |
| | 119 | 648 | 2 381 | 183.64 | 49.98 | 133.66 |
| Geraldton | 471 | 830 | 1 751 | 567.47 | 268.99 | 298.48 |
| **Total** | **6 193** | | | **8 382.25** | **3 131.79** | **5 250.46** |

a. The first figures are for when the port is the first port of loading and the second set of figures are for when the port is the second port of loading.

*Sources* WIRA (1990, 1992c).

## BENEFITS TO VESSEL OPERATORS

Vessel operators benefit from waterfront reform not only via lower stevedoring charges, but also via improvements in vessel turnaround times and schedule reliability.

## Reductions in stevedoring charges

Australian Stevedores' submission to the Part X Review stated (p.5):

> In the recent past there has been a surplus of stevedoring capacity which both conference and non-conference shipping lines have been able to take advantage of in rate negotiations.

The Trade Practices Commission (TPC 1992) noted:

> Bloc bargaining by the shipping lines, plus the very real pressure on terminals to compete vigorously to maintain throughput, potentially puts the lines in an advantageous bargaining position relative to terminals. They have a choice of terminal operators in all major ports.

The PSA (1994a) stated that it agreed with the 1993 Report of the Review of Part X that 'there has been intense competition between stevedores in the larger ports'.

### *Containerised cargoes*

PSA (1994a) indicates that national weighted annual average stevedoring revenue (that is, the average price charged by stevedores) declined from $254 per teu in 1990 to $193 per teu in 1993, a reduction of $61 per teu or 24 per cent (see table II.3). At the 1992–93 level of 1.935 million teus exchanged in Australian ports, this saving would have been worth some $118 million in a full year to vessel operators.

Most of the reduction occurred in 1992, with the PSA noting a marked slowing of the decline, to $190 per teu by June 1993, but then a rise to about $195 in the second half of 1993.

The PSA (1992a) had stated that its data indicated that the decline in stevedoring charges was not consistent across all shipping lines. The PSA noted that the ability to capture the benefits of stevedoring reform may be dependent on the relative bargaining strength of the various shipping lines. For example, Australia New Zealand Direct Line (ANZDL) in its submission to the Part X Review (p.36) claimed that its stevedoring charges had increased by 3 per cent from 1990 to 1992, and 30 per cent in Melbourne from early 1989 to May 1991 when a box rate was replaced by a per lift rate (ANZDL 1993b).

The APSA submission to the Review of Part X (1993b, p.35) cited claims of reductions of $30 to $40 per teu (attributed to Sweetensen of NTAL, now Australian Stevedores) up to $120 per teu (attributed to the Australian Shipping Users' Group). Baker (1993) of P&O Containers Pty Ltd (also a Director of CTAL) cited Rayner's (of CRA) estimates of $60 to $100 per teu flowing through to the vessel operator, but said these figures were 'somewhat high'. Baker claimed that both 'stevedoring and liner rates are largely at pre-1985 levels'. In its submission to the Review of Part X, Shipping Conferences Services Ltd (SCS, now Liner Shipping Services Ltd) said stevedoring charges had fallen by about $70 per teu on average (Part X Review Panel 1993, p.154).

Overall, it would appear, from comparison of the changes from 1990 to 1993 in average stevedoring expense per teu (down $76) and average stevedoring revenue per teu (down $61), that stevedores have passed forward to vessel operators about 80 per cent of the total savings they have achieved during the period of the waterfront reform process. The PSA (1994a, p.17) concluded that the productivity gains of the waterfront reform program 'have been substantially passed on in terms of lower prices'.

**TABLE II.3 NATIONAL WEIGHTED AVERAGE STEVEDORING REVENUE PER TEU**

| | *1990* | *1991* | *1992* | *1993* |
|---|---|---|---|---|
| Revenue ($/teu) | 254 | 244 | 195 | 193 |
| Reduction ($/teu) | | 10 | 59 | 61 |
| Teus (million) | | 1.69 | 1.85 | 1.94 |
| Total reduction[a] ($ millon) | | 16.9 | 109.2 | 118.3 |

a. Compared with 1990.

*Source* BTCE estimates based on PSA (1994a,c), ATAC (1993) and ATC (1993).

Comparison of tables II.1 and II.3 shows that reductions in stevedores' expenses generally exceeded reductions in revenues between 1990 and 1993. However, expenses exceeded revenue in 1990, and fell by much more than revenue between 1990 and 1991. From 1991 to the middle of 1993, expenses and revenue were approximately equal, so that it is

reasonable to conclude that stevedores had passed forward the savings they achieved from waterfront reform to that time. From the middle of 1993, average revenues have been rising while average expenses fell again[5] after being steady in the first half of 1993, probably a reflection of increasing levels of trade.

The cost structure of container operations is characterised by declining average costs. If a terminal has excess capacity it is in the interests of the stevedore to attract new business as long as prices exceed marginal costs. At the margin, there is likely to be considerable rivalry for market share as long as the excess capacity exists. Switching of shipping companies between terminals, as has occurred in recent times, is evidence of this rivalry.

The rivalry serves to keep prices down to competitive levels. If the demand grows so that the excess capacity is removed, the incentives for rivalry between the stevedores will also decline, and price increases are likely to follow.

Also to be taken into account are the costs of waterfront reform to vessel operators, in particular the Statutory Tonnage Levy, paid by vessel operators. This levy, introduced on 1 January 1990 and due to expire in late 1995, is set at $1.25 per tonne on overseas cargo and $0.25 per tonne for coastal cargo, with a levy also on bulk cargoes. In effect it is an increase in vessel operators' cargo handling costs which in part offsets the reductions in stevedoring charges that have occurred with waterfront reform. Vessel operators then have to recoup this levy from shippers via the freight rate, or via THCs where these are levied separately from the freight rate.

The effect of the levy on container vessel operators can be illustrated by taking $61 per teu as a representative stevedoring price reduction as at December 1993, and subtracting the Statutory Levy (on say 10 tonnes

---

5. While none of the $11 per teu reduction in average stevedoring expense between the first half of 1993 ($191 per teu) and the second half ($180 per teu, PSA 1994c) has been passed forward to shippers (as average revenue per teu actually rose), only a portion of this reduction in stevedoring could be attributed to waterfront reform. The BTCE estimates that at least $3 million in stevedores' cost savings in 1993 for containerised cargo can be attributed to waterfront reform. The amount due to waterfront reform will be greater than or equal to the decrease in total stevedoring expense between 1992 and 1993, given that throughput has increased. In 1992, total expense was about $362.6 million (1.85 million times $196). In 1993, total expense was about $359.9 million (1.935 million times $186).

per teu at $1.25 per tonne) of about $12.50 on average, giving a net saving of $48.50 per teu.

### *Non-containerised general cargo*

The PSA monitoring report number 2 (PSA 1993b) estimated that, for one stevedoring company, average unit costs for steel, timber and paper had fallen by 12 per cent between June and December 1992, on top of significant falls (14.5 to 30 per cent) between October 1991 and June 1992. The compounded reductions would be about 28 to 46 per cent.

For the other company monitored, results were 'mixed', with only a compression of the margins between revenue and expenses being evident between June and December 1992. This followed increases of 39 per cent in revenues per tonne between 1990 and June 1992 in Victoria and decreases of 57 per cent in Western Australia. Nevertheless, the PSA (1993b) concluded that there had been considerable cost savings to users in general stevedoring.

There may not have been the same pressures to compete for throughput as there have been in container terminal operations, mainly because fixed costs are a less important factor in conventional stevedoring. In some areas, stevedoring firms have chosen to increase quality of service rather than reduce prices.

However, overall the evidence suggests that a large proportion, but not all, of the savings have been passed on in reduced prices. Some of the benefits have been passed on as improved quality of service, such as better care of the cargo and reduced damage. An assumed 80 per cent pass-through of the $18 million savings (estimated above) would reflect these considerations. That is, the savings passed on to ship operators are estimated to be $14.4 million in both 1992 and 1993. Stevedores of non-containerised general cargoes would thus have retained about $3.6 million.

### *Bulk cargo*

Stevedore charges for bulk cargoes are usually paid directly by the shipper and therefore do not affect the ship operator.

## Vessel turnaround times, reliability and scheduling

### *Container ships*

The BTCE (1990) estimated that the costs of waterfront unreliability to all vessel operators in 1988 was approximately $200 million to $250 million. This included $45 million to $55 million for normal delays to liner ships (that is, built into schedules), and $96 million to $102 million for unscheduled delays to container and ro-ro ships.

ANL has commented that the PSA's view that non-price benefits from faster vessel turnaround should ultimately translate into price reductions overlooked the indivisibilities of supply in liner shipping (ANL 1993, p.36). Significant cost reductions to vessel operators would come only if enough time were saved to enable them to withdraw a vessel from the trade while still maintaining service levels.

Similarly, the liner operator ANZDL stated (1993b, p.34):

> The CTPA study [conducted for ANZDL] suggests that while the PSA is correct in pointing to reductions in the cost of stevedoring operations and lower stevedoring charges, and WIRA is correct in claiming significant gains in stevedoring productivity, such gains do not necessarily imply a reduction in the total port and cargo handling costs payable by a shipping company.

ANZDL estimated that waterfront reform generated savings of 1.75 to 2 days per round voyage (to the USA). However, ANZDL stated that while these savings allow slower steaming with lower fuel costs and/or enhance the reliability of tight voyage schedules, the savings were not such as to allow a significant increase in voyage frequency or to reduce tonnage committed to the trade or to postpone ordering new vessels. (However, the saving would allow greater flexibility in scheduling, of which ANZDL has been able to take advantage by introducing additional port calls to Brisbane.)

WIRA (1992a) claimed a reduction of about 40 per cent in turnaround time for an average teu exchange, and estimated that this would be worth about $40 per teu to the ship operator. At the 1991–92 level of 1.7619 million teus exchanged in Australian ports, this saving would be worth some $70.5 million per year to vessel operators (and $77.4 million in 1992–93 with 1.935 million teus exchanged).

The WIRA figure is corroborated by BTCE estimates. There were 1746 international liner voyages to Australia in 1992–93, so the average exchange per voyage is about 1110 teus.[6] The value of 1.75 days saved at $20 000 to $25 000 per vessel per day[7] is thus about $32 to $40 per teu exchanged.

The reduction in loading and unloading time for a typical larger cellular container ship visiting Sydney (exchanging 1400 teus), Melbourne (exchanging 1500 teus) and Brisbane (exchanging 1100 teus)[8] would be of the order of six days, based on WIRA data on improvements in productivity measured in teus per hour elapsed. For a 2000-teu vessel, costs would be around $30 000 per day,[9] so the six days would represent savings of around $180 000, or about $45 for each of the 4000 teus involved.

### *General cargo ships*

Non-containerised general cargo is very diverse in its stevedoring requirements. The lack of uniformity makes monitoring and investigation especially difficult. WIRA adopted a measure of cargo units for non-reefer cargo in an endeavour to make some general conclusions about waterfront reform.

Loading rates published by WIRA for the major ports allow estimation of turnaround times both at the start of the WIRA process and at the end. Stevedoring elapsed times for ships visiting the ports were estimated, using both 1989 and 1992 productivity rates. The difference in elapsed times, multiplied by a daily charter rate for a typical vessel, was

---

6. 1.935 million teus divided by 1746 voyages = 1108 teus exchanged per voyage.
7. Containerisation International (1993) gives a hull-only charter rate of US$12 000 per day for a 1100-teu containership. Travers Morgan (1994), using the ESCAP SHIPCOST model, estimate the daily in-port total cost of a small containership at 1.55 times the daily capital cost. The daily in-port total cost of the 1100-teu ship would thus be some A$25 000.
8. Teu exchanges are typical of large ships visiting the three ports.
9. Lloyd's Shipping Economist (1994b) gives hull-only charter rates of US$18 000 to US$19 000 per day for containerships of 1830 teus – 2138 teus, while Containerisation International (1993) gave a figure of $US15 000 per day for a 2000 teu ship. Travers Morgan (1994) estimate the daily in-port total cost to be 1.4 times the daily capital cost for mid-sized containerships. On the basis of a daily charter rate of, say, US$16 000, the daily in-port cost of a 2000 teu containership would be about A$30 000.

a measure of the benefit of reform to conventional ship operators. Using a charter rate of US$10 000 per day for a large (35 000 dwt) tramp ship (Lloyd's Shipping Economist 1994a), estimated savings in 1992 were $19.9 million.

Weighted average productivities were calculated for 1989 and 1992. The weighted average productivity increased from 13.9 tonnes per elapsed hour in 1989 to 20.5 tonnes per elapsed hour in 1992 for reefer cargo. Over the same time period, weighted average productivity for non-reefer cargo increased from 2.4 units per elapsed hour to 5.5.

Anecdotal evidence provided to the BTCE suggests that there was little or no further improvement in 1993 and for some ship operators performance declined. The 1993 savings are therefore assumed to be the same as in 1992. This is conservative as cargo volumes generally increased in 1993.

### *Bulk ships*

Bulk ship operators have also achieved benefits through faster turnaround times for their ships. Using WIRA data, and a method similar to that used to estimate benefits for conventional ships, the BTCE estimated elapsed times for the bulk ships visiting the ports during the first nine months of 1992, using both 1990 and 1992 productivity rates. The difference in elapsed times was a measure of the benefit of reform to bulk ship operators.

A typical charter rate (US$10 000 / day) for bulk ships calling at Australian ports was found in Lloyd's Shipping Economist (1994a). The product of the time saved and the charter rate gave an estimated savings in bulk ship costs of $4.0 million in 1992 and $4.8 million in 1993. Table II.4 shows the details of the calculations for grain ships.

Fertiliser ships, the other major bulk commodity affected by WIRA, added a further $400 000 to the total shown in table II.4.

## Net total benefits realised by vessel operators

Based on the PSA (1994c) estimate for the reduction in stevedoring charges and the WIRA (1992a) estimate for time savings, the total benefits realised by vessel operators would be about $89 per teu by

**TABLE II.4 SAVINGS IN ELAPSED TIME FOR GRAIN SHIPS, 1992**

| *Port* | *Tonnes loaded in 1992* | *Tonnes per hour elapsed* | | *Hours elapsed at* | | *Elapsed time saving (hours)* |
|---|---|---|---|---|---|---|
| | | *1990* | *1992* | *1990 rate* | *1992 rate* | |
| Mackay | 13 000 | 211 | 658 | 61.6 | 19.8 | 41.8 |
| Pinkenba 1 | 24 000 | 326 | 312 | 73.6 | 76.9 | –3.3 |
| Pinkenba 2 | 5 000 | 268 | 220 | 18.7 | 22.7 | –4.1 |
| Fisherman Is. | 148 000 | 815 | 900 | 181.6 | 164.4 | 17.2 |
| Newcastle | 33 000 | 954 | 1 131 | 34.6 | 29.2 | 5.4 |
| Port Kembla | 285 000 | 563 | 1 018 | 506.2 | 280.0 | 226.2 |
| Adelaidea | 290 000 | 392 | 575 | 739.8 | 504.4 | 235.4 |
| | 105 000 | 328 | 577 | 320.1 | 182.0 | 138.1 |
| Port Gilesa | 39 000 | 531 | 506 | 73.4 | 77.1 | –3.6 |
| | 137 000 | 354 | 512 | 387.0 | 267.6 | 119.4 |
| Wallaroo | 381 000 | 178 | 595 | 2 140.4 | 640.3 | 1 500.1 |
| Port Pirie | 318 000 | 398 | 499 | 799.0 | 637.2 | 161.7 |
| Port Lincolna | 690 000 | 921 | 1 366 | 749.2 | 505.1 | 244.1 |
| | 153 000 | 776 | 975 | 197.2 | 156.9 | 40.2 |
| Thevenard | 175 000 | 249 | 403 | 702.8 | 434.2 | 268.6 |
| Esperance | 248 000 | 209 | 312 | 1 186.6 | 794.9 | 391.7 |
| Albanya | 616 000 | 630 | 633 | 977.8 | 973.1 | 4.63 |
| | 120 000 | 624 | 449 | 192.3 | 267.3 | –75.0 |
| Kwinanaa | 1 823 000 | 605 | 1092 | 3 013.2 | 1 669.4 | 1 343.8 |
| | 119 000 | 517 | 765 | 230.8 | 155.6 | 74.6 |
| Geraldton | 471 000 | 317 | 398 | 1485.8 | 1 183.4 | 302.4 |
| **Total** | **6 193 000** | | | **1 4071.2** | **9 041.5** | **5 029.6** |

a. The first figures are for when the port is the first port of loading and the second set of figures are for when the port is the second port of loading.

*Sources* WIRA (1990, 1992b).

1993.[10] Table II.5 shows BTCE estimates of savings to vessel operators, including those from non-container and bulk vessels.

These benefits appear to have been reflected in vessel operators' profits. The Chairman of P&O attributed a record profit result in Australia in

10. Similarly, the Wool Industry Shipping Group submission to the Review of Part X, (WISG 1993, p.13) put the benefits that vessel operators have received from waterfront reform at approximately $100 per teu.

**TABLE II.5 SAVINGS TO VESSEL OPERATORS DUE TO WATERFRONT REFORM**

| *Cost component* | *1992* | *1993* |
|---|---|---|
| **STEVEDORING SAVINGS** | | |
| *Containers* | | |
| Gross reduction ($/teu) | 59.0 | 61.0 |
| Less statutory levy[a] ($/teu) | 12.0 | 12.0 |
| Sub-total | 47.0 | 49.0 |
| Less 20% not due to reform[b] ($/teu) | 9.4 | 9.8 |
| Net savings ($/teu) | 37.6 | 39.2 |
| Teus ('000) | 1 848[c] | 1 935[d] |
| Total savings — containers ($ millon) | 69.5 | 75.8 |
| *Other cargo types* | | |
| Total savings — breakbulk ($ millon) | 14.4 | 14.4 |
| **Total savings[e] ($ millon)** | 83.9 | 90.2 |
| **SHIP TIME COSTS** | | |
| *Containers* | | |
| Savings per teu ($) | 40.0 | 40.0 |
| Total savings — containers($ millon) | 74.0 | 77.4 |
| *Other cargo types* | | |
| Total savings — breakbulk ($ millon) | 19.9 | 19.9 |
| Total savings — bulk ($ millon) | 4.4 | 5.2 |
| **Total savings ($ millon)** | 98.3 | 102.5 |
| **TOTAL SHIP OPERATOR SAVINGS ($ millon)** | **182.2** | **192.7** |

a. $1.25 per tonne (international) and $0.25 per tonne (coastal).

b. About 20 per cent of stevedores' cost savings are due to reductions in interest rate and depreciation and therefore unrelated to waterfront reform.

c. Average of 1991–92 and 1992–93.

d. Container numbers for 1992–93.

e. Stevedoring costs for bulk cargo are paid directly by the shipper and are not a cost saving for ship operators.

*Source* BTCE estimates based on PSA (1994a), ATAC (1993) and ATC (1993).

1993 not only to a stronger Australian economy, but also to the results of waterfront reform (Newcastle Herald 1994, p.11).

For Australia, given that the overwhelming majority of liner ships in the Australian trades are overseas owned, the key question is: to what extent have vessel operators passed these forward to shippers? That is, what has been the effect of stevedoring reform on freight rates and other charges by shipping lines? This issue is taken up in appendix III.

# APPENDIX III THE BENEFITS TO SHIPPERS

The benefits of stevedoring reform can be categorised as:

- reduction of stevedoring costs which are passed on to users in the form of lower prices;
- improved performance reflected in faster turnaround time for ships;
- improved reliability reflected in improved trading conditions for shippers; and
- reduced truck queuing at container terminals reflected in reduced demurrage payments for Australian shippers.

The first two benefits are received initially by ship operators. In appendix II it was concluded that the lower stevedoring costs are generally fully passed on to ship operators. Shippers can in turn benefit provided that ship operators pass on their reduced costs in the form of lower prices or improved quality of service. The last two benefits are received directly by shippers.

## SHIP OPERATOR RESPONSES TO LOWER STEVEDORING PRICES

For some routes, stevedoring prices are included in terminal handling charges (THCs) which are added on to the freight rate for import cargoes. The routes for which THCs are levied are those from Europe and North America.

For other routes, stevedoring prices are incorporated in the freight rate. Therefore, lower stevedoring prices can be expected to be reflected in lower freight rates. However, stevedoring prices are not the only factor influencing the level of freight rates, and in fact may be only a minor factor. The balance between supply and demand and the degree of

competition between different sectors of the market are likely to be much more important. For example, the Metals and Minerals Shippers' Association of Australia Ltd (MAMSAAL 1993, p.12) used the question of waterfront reform benefits in its freight rate negotiations over the two years prior to 1993, and had obtained reductions. However, MAMSAAL noted that the marketplace, rather than any single factor such as waterfront reform benefits, determined the rate outcome.

However, if the liner market exhibits competitive characteristics, it is a reasonable conclusion that any change in stevedoring prices will be reflected in corresponding changes in freight rates.

### Reductions in terminal handling charges

THCs are levied by the lines on import cargoes from Europe and North America to recoup a proportion of Australian stevedoring charges. The THC covers a proportion of the cost of unloading full containers, the cost of retrieving empty containers, and the Statutory Levy. Hence, for these Australian importers, the benefits of waterfront reform flowing from reductions in stevedoring charges to vessel operators might be expected to be immediately apparent in movements in THCs. This would be especially so in the Europe trade, where the THC recovers 80 per cent of Australian stevedoring charges, but less so in the North American trades, where the proportion is only about 40 per cent.

The PSA (1993a, p.13) stated that, being a 'straight cost transfer...[the THC] gives an unbiased, partitioned indication of whether the price reduction benefits of stevedoring reform are being passed directly on to shippers'. Table III.1 shows levels of THCs in the European southbound trade since their introduction in 1986 (at which time freight rates were reduced by a compensating amount).

The PSA (1992a) had found that in 1992, THCs in the European trade had declined relatively less than the decline in stevedoring charges (levied by stevedores on the lines). THCs in the Europe trade had declined by $23.90 in Brisbane, $24.37 in Sydney and $30.82 in Melbourne from 1990 levels by April 1992. Based on 1991–92 teu throughput, a weighted average reduction would be about $27.40. The PSA calculated that THCs had declined by about 12 per cent between February 1991 and April 1992, which is less than the average reduction in stevedoring charges to the lines over this period.[1]

1. As noted in appendix II, PSA (1994a) estimated that national average stevedoring revenue per teu fell from $244 in 1991 to $195 in 1992, a reduction of 20 per cent.

More recently, while THCs for 20-foot containers have remained relatively stable, THCs for 40-foot containers have declined significantly. THCs for 40-footers are now much closer to those for 20-footers, rather than about twice as high (PSA, pers. comm. 1994). This reflects the current trend for stevedores to negotiate contracts based on a rate per container rather than a rate per teu. However, most Australian trade is still in 20-foot boxes. The PSA (1994b) concluded that changes in THCs reflect reasonably well the changes in stevedoring prices.

Terminal handling charges in the southbound North American trades form a component of Australian Port Charges Additional (APCAs). They are designed to recoup about 40 per cent of Australian stevedoring charges, although the PSA (1992a) stated that the methodology by which these THCs were set was not clear. The levels of APCAs did not change between 1991 and April 1992. Since then, APCAs have not declined much generally, although one line (ANZDL) has made significant reductions (PSA, pers. comm. 1994).

The PSA (1992a, p.71; 1993a, p.13) had concluded that, while there was some evidence of stevedoring reductions being passed on to shippers, not

**TABLE III.1 TERMINAL HANDLING CHARGES[a]: EUROPE TO AUSTRALIA**
*($/teu)*

| *Date* | *Brisbane* | *Sydney* | *Melbourne* |
|---|---|---|---|
| Jan 1986 | 82.00 | 47.40 | 63.35 |
| Jan 1987 | 112.00 | 72.40 | 77.57 |
| Feb 1988 | 137.00 | 103.40 | 101.57 |
| Jan 1989 | 137.00 | 116.40 | 121.95 |
| Jan 1990[b] | 172.00 | 131.40 | 145.95 |
| Feb 1991[c] | 212.00 | 220.19 | 227.54 |
| Feb 1992[c] | 232.90 | 208.85 | 197.79 |
| Apr 1992[c] | 188.10 | 195.82 | 196.72 |
| Jan 1993 | 188.10 | 195.82 | 196.72 |
| Apr 1994 | 188.10 | 207.30 | 208.22 |

a. Total charge less wharfage and Port Pricing Additional.

b. Full recovery of shippers' share of stevedoring costs based on a 70 per cent shipper: 30 per cent vessel operator split.

c. Full recovery based on an 80 per cent shipper: 20 per cent vessel operator split.

*Sources* PSA (1992a); Australia to Europe Liner Association (pers. comm. 1994).

all of the benefits had flowed through. There may have been a number of reasons for this.

- Full flowthrough of the benefits would mean that average THCs in the Europe trade would decline by only 80 per cent of the average decline of $64 in stevedoring rates; that is, by about $51.20 by mid-1993. Against this must be set the effects of the Statutory Levy of $1.25 per tonne on international cargoes, paid in the first instance by the vessel operator, which would raise $12.50 on a typical import container load of 10 tonnes. Hence the net reduction which might be expected, other things being equal, would be about $38.70 by mid-1993.

  In the US trade, operators aim to recover 40 per cent of stevedoring costs with THCs (PSA 1994b, p.10). The reduction in THCs to reflect this would be $13.10, using the same method of calculation as for the European trade.

  The PSA reported that the 1993 weighted average level of THCs for both the European and US trades was $122, a reduction of $29 since 1991 (PSA 1994b, p.8). Overall the average reduction in THCs could therefore be consistent with a passing on of stevedoring price reductions.

- The PSA (1992a) noted that differences in timing between stevedoring contract negotiations and the setting of THCs may have been a factor. Data in appendix II showed that the large reduction in stevedoring charges occurred in 1992, with only a minor reduction having been achieved in 1991.

- There may have been differences between stevedoring price reductions achieved by the conference lines and those achieved on average by independent vessel operators. As noted above, PSA data indicated that stevedoring reductions had not been uniform, but depended on the bargaining strength of the lines.

- The THC contains a component for the stevedoring of empty containers, and the proportion of empties can vary substantially over time. The influence of empty containers could introduce an element of divergence between THCs and average stevedoring costs.

- The PSA (1990) reported higher stevedoring rates in Sydney for lines with an ownership interest in the terminals. It may be that the European conference, dominated by P&O, is prepared, given the

declining marginal costs of terminal operation, to suffer a smaller reduction in its own stevedoring rates in order that the terminal operator CTAL can better compete for market share of non-conference vessels.

- The PSA collects stevedoring cost and revenue data from a 35 per cent sample of container throughput and THCs for about 20 per cent of inbound trade. There are considerable variations in the stevedoring prices paid by different lines, so inconsistencies between the two samples can introduce errors in the comparison of the changes in THCs and stevedoring prices. The PSA warns that, for this reason, the results should be interpreted with caution (PSA 1994b, p.8).

**Reductions in liner freight rates**

The theoretical consideration of liner freight rates in appendix I concludes that the models that best describe the behaviour of conferences imply that reductions in costs would be largely passed on in a reduction in freight rates. The empirical evidence provides a test of how well the theory represents the actual responses of liner operators.

For Australian exporters and importers not paying THCs, the benefits of waterfront reform flowing from reductions to vessel operators would be apparent primarily in movements in freight rates. For example, in the Australia to Europe northbound trade, the Ocean Service Rate covers the costs of stevedoring in Australia as well as ocean carriage.

The Australian Peak Shippers' Association (APSA) is the Designated Peak Shipper Body which represents Australian exporters using liner shipping in various negotiations with conferences and independent operators. APSA membership covers 85 per cent of containerised export volumes. In its submission to the Part X Review (p.33), APSA stated that freight rates are market-based, not cost-plus, and went on to say that in 'freight rate negotiations for 1993 ... rates have been reduced. In most cases the reductions are significantly greater than any reform benefits.' Table III.2 shows data on freight rate reductions, from APSA's Part X Review submission (APSA 1993, appendix 10). Liner operator NYK (1993, p.6) also was of the view that freight rate negotiations over the previous 18 months had generally resulted in reductions 'well in excess of benefits achieved by the lines'.

APSA also stated in its submission to the Part X Review:

> In freight negotiations during the past eight months in which either APSA has played a part or has knowledge of, the results of waterfront reform have been taken into consideration in negotiations but more often than not the combined increases in other [vessel cost] items ... nullify any benefits from waterfront and port reform in Australia...

Shipping Conference Services (SCS 1993) cited a report in the *Daily Commercial News* (2 October 1992) of Frank Beaufort of APSA saying that outward container freight rate reductions in the last quarter of 1992 were $90 to $150 per teu, with further reductions expected in 1993.

**TABLE III.2 1993 FREIGHT RATE MOVEMENTS**

| *Commodity* | *Trade* | *Change (per cent)* |
|---|---|---|
| Metals | Europe | –23.81 |
| | East Asia | –18.66 |
| | Japan/Korea | –20.00 |
| | New Zealand | – 8.30 |
| Wood panels | New Zealand | –29.78 |
| Cotton | South East Asia | up to –6.5 |
| | East Asia | up to –20.0 |
| | Europe | up to –3.5 |
| Wool | Europe | –5.0 |
| Dairy | East Asia | –29.20 |
| Cheese, butter | USA East Coast | –7.73 |
| | USA West Coast | –4.59 |
| Casein | USA East Coast | –4.91 |
| | USA West Coast | –2.57 |
| Milk powder | USA East Coast | –4.31 |
| | USA West Coast | –2.00 |
| Malt | South East Asia | –3.13 |

*Source* APSA (1993).

Figure III.1, based on data from SCS (ANL 1993, p.14), shows movements in real[2] export freight rates for the Australia to Europe, Japan / North Asia and SE Asian trades from 1982 to 1992. These changes would translate into significant nominal decreases over the period 1990 to 1992, given the low rates of inflation over this period.

For the North American trades, a sample of 26 export rates was supplied to the Part X Review Panel by the North American conference (AUSCLA 1993). This showed an unweighted average decrease in Australian dollars of $334 or about 8 per cent between 1988 and 1993.[3] Individual export rates dropped by up to $1135 for dry boxes and up to $1600 for reefer boxes.

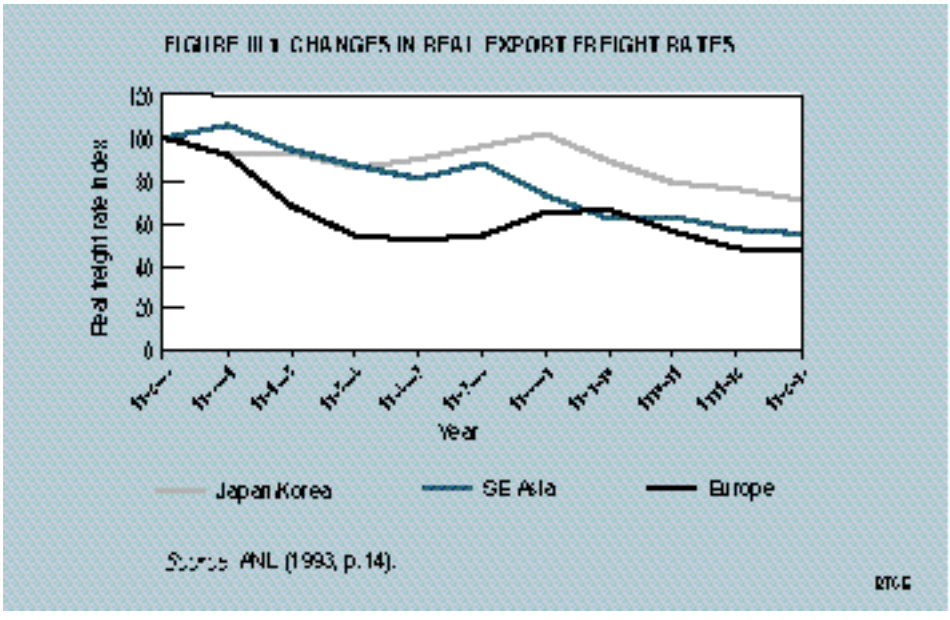
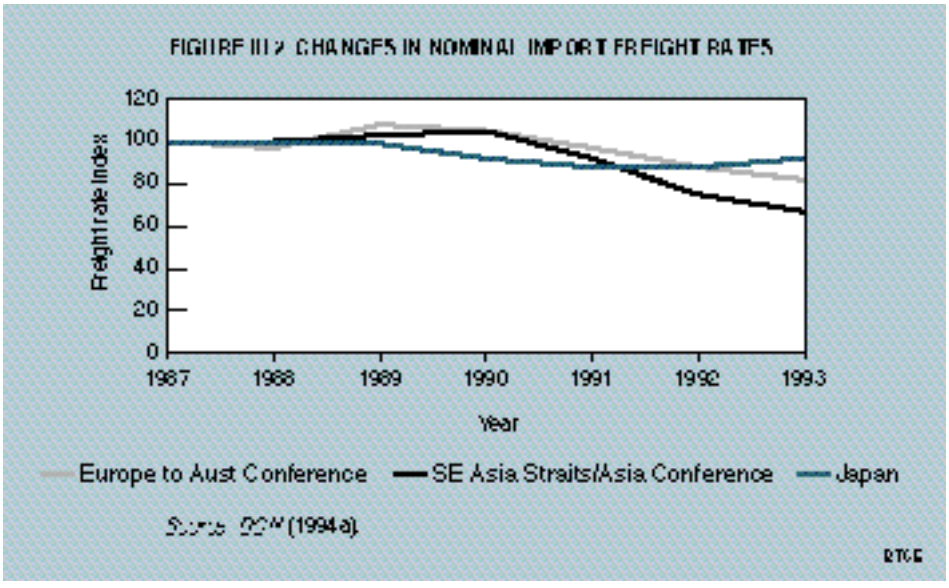



FIGURE III.1 CHANGES IN REAL EXPORT FREIGHT RATES

Source: ANL (1993, p.14).

2. Deflated by the CPI.
3. The AUSCLA rates were set to expire between 30 November 1993 and 30 June 1994, with review periods between 5.0 and 6.1 years, depending on commodity; that is, the rates in 1990 would have been the same as those set in 1988. Import $A rates in 1990 would also have been similar to those in 1988 as the exchange rate was much the same in 1990 as in 1988.

Figure III.2, also based on SCS data (DCN 1994a), shows that nominal import freight rates in the Europe and SE Asian trades had fallen significantly between 1990 and 1993. However, those in the Japan trade were much the same in 1993 as in 1990.




For the North American trades, a sample of import rates was supplied to the Part X Review by the North American conference (AUSCLA 1993). This showed decreases in US dollar terms in all but one case between 1988 and 1993, but an unweighted average increase of about 6 per cent when expressed in Australian dollars, as the A$/US$ exchange rate dropped about 14 per cent over this period.

Based on the various trades above, a tonnage weighted average freight rate reduction would be about $129 per teu northbound and $148 per teu southbound, or of the order of $140 per teu on average. At the 1992–93 level of about 1.8 million international teus exchanged in major Australian ports, a $140 per teu freight rate saving would be worth some $250 million to shippers of liner cargoes.

## The extent to which lines have passed forward savings in stevedoring charges and vessel operating costs

### *Containerised cargoes*

While THCs in the European import trade may not have fallen by the full amount of the reduction in stevedoring charges, for the reasons given above, these shippers also benefited from recent reductions in liner freight rates in this trade. In the North American trades, APCAs (of which THCs are a component) appear to have remained largely unchanged in recent years, but import freight rates in these trades appear to have increased slightly in recent years, at least in Australian dollar terms.

In general, however, export freight rate reductions in recent years considerably exceed the reductions in stevedoring charges, and appear to approximate the total value of stevedoring plus vessel operating costs. Import freight rates appear also to have declined significantly in some other major trades where Australian stevedoring costs are included in the freight rate.

Overall, it would thus appear that vessel operators have substantially passed forward to shippers the benefits they have received from waterfront reform. This conclusion is supported, to some extent, by confidential profitability data supplied by liner operators to the Part X Review (1993), which showed losses or low profits for liner vessel operators in the Australian trades in recent years.[4]

---

4. A total of 83 annual profitability results were reported for various years, of which 29 or about 35 per cent were profits (3 after State subsidy) or break-even. Of the profit results, 10 were made in the east coast to North Asia trade, and 10 in the Europe trade. In only 6 of 20 cases did the operator indicate that it was profitable in its financial year ended in 1992. Aggregate profit for these cases was A$6.8 million plus one profit reported only as a rate of return. Losses in excess of A$38.9 million were indicated for the other lines/trades in their financial year ended in 1992 (one operator only advised a negative rate of return on capital). The aggregate net position for 1991–92 was a loss of A$32.1 million. This figure does not include the two results, one reported as a positive rate of return on assets and one reported as a negative rate of return. However, most lines reported, or appeared to have earned, operational profits; that is, before depreciation, administration and overheads were considered. Most cases also appeared to be profitable after depreciation but before administration and overheads. Some lines reported very high levels of administration or overhead costs (Part X Review Panel 1993). However, even given this, there appeared to be no evidence of excess profits in the Australian liner trades at that time. That is, it appears that liner operators have extracted no obvious economic rents in recent years.

Table III.3 shows BTCE estimates of the savings to shippers from decreases in stevedoring prices, based on the conclusion that vessel operators have passed forward the decreases as freight rate reductions. In the North American trades southbound rates have risen in Australian dollar terms in recent years, although rates expressed in US dollars have fallen. The benefit to shippers has been taken to be only the reduction in THCs in this trade. That is a benefit of $29 per teu (see table III.3) compared with the net saving of $49 per teu. The difference of $20 per teu, totalling $3.1 million for the trade, is retained by ship operators.

In the Europe southbound trade, although THCs have been reduced, freight rates have fallen by more than the reduction in stevedoring charges, so a full flow-through of benefits has been assumed.

The total estimated savings in stevedoring costs to shippers of Australian containerised cargoes were $83.3 million in 1992, and $91.7 million in 1993, much the same as the reductions in the prices of stevedoring services over these periods. However, 20 per cent of the reductions in stevedoring costs are attributable to factors unrelated to stevedoring reform. The savings to shippers attributable to waterfront reform induced reductions in stevedoring prices is thus estimated at 80 per cent of $91.7 million, or $73.4 million, in 1993.[5]

Savings in vessel operating costs passed on to shippers should be added to this total. In appendix II the total savings in vessel operating costs were estimated at $74 million in 1992 and $77.4 million in 1993. But ship operators on the inwards trade from the United States appear to have not reduced freight rates in response to changes in their costs following waterfront reform. In appendix II, vessel operating cost savings, calculated on a teu basis, averaged $40 per teu. On this basis the estimated savings passed on to shippers are $68.1 million in 1992 and $71.2 million in 1993.[6] That is, ship operators retained $6.2 million of these vessel operation savings in 1993, giving a total of $8.6 million savings retained by ship operators.

---

5. Ship operators therefore retain $2.4 million of stevedoring benefits received by them. The $2.4 million is approximately 80 per cent of the total stevedoring savings not passed on.
6. There were 146.8 thousand teus imported from the US in 1992 and 156.2 thousand in 1993. Therefore the savings passed on are $74 – (40 x 0.1468) million for 1992 and $77.4 – (40 x 0.1562) million in 1993.

**TABLE III.3 BENEFITS TO SHIPPERS FROM STEVEDORING PRICE REDUCTIONS — CONTAINERISED CARGO**

| | *Calendar year* | |
|---|---|---|
| | *1992* | *1993* |
| **Teus ('000)[a]** | | |
| Total | 1848.4 | 1935.0 |
| Imports from Europe | 166.9 | 173.6 |
| Imports from US | 146.8 | 156.2 |
| Total less imports from Europe and US | 1534.8 | 1605.2 |
| **Stevedoring prices ($/teu)** | | |
| Average price | 195 | 193 |
| Average reduction compared with 1990[b] | 59 | 61 |
| Statutory levy | 12 | 12 |
| Net reduction | 47 | 49 |
| **Total net savings in stevedoring charges ($ millon)** | 86.9 | 94.8 |
| **Savings to shippers** | | |
| *THCs* | | |
| Average reduction in THCs ($/teu) | 23 | 29 |
| Imports from Europe ($ millon) | 3.8 | 5.0 |
| Imports from US ($ millon) | 3.4 | 4.5 |
| *Freight savings* | | |
| Total less imports from Europe and US ($ millon)[c] | 72.1 | 78.7 |
| Imports from Europe ($ millon)[d] | 4.0 | 3.5 |
| **Total savings to shippers ($ millon)** | **83.3** | **91.7** |
| **Savings due to waterfront reform (80% of total)** | **66.6** | **73.4** |

a. Teu numbers are for 1992–93.

b. 1990 price was $254/teu (PSA 1994a).

c. 100 per cent flowthrough of stevedoring price reductions net of levy.

d. 100 per cent flowthrough of stevedoring price reductions net of levy and THC reductions.

*Source* BTCE estimates based on PSA(1994a,b,c).

### *Non-containerised general cargo*

The savings in stevedoring prices for operators of general cargo vessels were estimated to be $14.4 million in appendix II. In addition, vessel operating costs were estimated to be reduced by $19.9 million. It is highly probable that general cargo vessel operators would face similar incentives to container vessel operators to pass on savings, and for this reason the full savings in stevedoring prices and vessel operating costs are assumed to have been passed on to shippers of non-containerised general cargo.

### *Bulk cargo*

The Australian Wheat Board (Part X Review Panel 1993) estimated that stevedoring reform and the adoption of continuous loading (facilitated by waterfront reform) had brought savings of $35 million to grain shippers. Only part of these savings can be attributable to savings in stevedoring labour costs passed on by stevedores. As the bulk shippers rather than the ship operators generally pay the stevedoring charges, the savings estimated in appendix II at around $2.5 million in 1992 and $3.8 million in 1993 will have directly benefited shippers of bulk cargo.

The reductions in bulk vessel operating costs estimated in appendix II were $4.4 million in 1992 and $5.2 million in 1993. For bulk commodities, the most common arrangements for shipping are for ships to be chartered, or for the commodity to be carried in ships operated by the cargo owner. In either arrangement the benefits of reduced operating costs initially flow directly to the exporter or the importer. Which of them is the initial recipient of the savings depends on whether the commodity is sold free-on-board (fob) or cost, insurance and freight (cif). If it is sold fob, the importer initially gains from the reductions in vessel costs, and if it is sold cif it is the exporter who gains.

## QUALITY-OF-SERVICE IMPROVEMENTS

Quality-of-service benefits to Australian shippers include more predictable cargo arrival and departure dates, shorter transit times, and lower transport costs between wharf and warehouse. Welfare gains to Australia include the consumer surplus increases to existing shippers and the increase in consumer surplus accruing to the shippers of the increased amount of imports and exports. In figure I.1 the area *b* represents gains, in terms of consumer surplus, to existing shippers from

improvements in quality of service, while area *d* represents gains to new shippers who have been induced to trade by the improvement in service quality.[7]

### Effect of improved reliability on trade volumes

The BTCE (1990) estimated the total welfare impact of forgone exports due to waterfront unreliability at between $210 million and $314 million in 1988. The removal of all sources of unreliability would be required for welfare to be increased by this amount.

Although there are likely to be trade increases over time due to reliability improvements and reduced costs on the Australian waterfront achieved so far, the effects at this stage are likely to be minor. The welfare gains are unlikely to approach the estimated losses in 1988 for some considerable time.

At this stage there are no satisfactory estimates of the effect of waterfront reform on export volumes and, to the extent that trade has increased because of waterfront reform, the estimated total benefits are understated.

### Reductions in delays to cargo arrival and departure

Douglas and Miller (1974), cited in BTCE (1993a), modelled quality of service offered by airlines, and defined the expected delay (schedule delay) as being the sum of frequency delay and stochastic delay. Frequency delay is the difference between the most desired departure time and the closest scheduled departure. Stochastic delay is random delay. In the Douglas and Miller paper stochastic delay is due to random demand fluctuations causing some passengers to miss flights because some flights are fully booked, but in a waterfront context stochastic delay may be due to waterfront performance unreliability. It may also be caused by vessel operators holding ships at berth for operational reasons or by shippers delivering cargo late.

---

7. The sum of areas d and e in figure I.1 represents the total welfare gain to the economy from the increased trade which can be expected to follow the improvement in Australian waterfront performance.

### *Frequency delay*

BHP Transport (1993, p.20) stated that fixed day delivery to Australia's major exporting regions had to be achieved within two years to ensure that it met international standards.

The improvement in Australian waterfront reliability has been sufficient to allow some lines to introduce fixed day sailings in recent times in the Australian liner trades.[8] Vessels are advertised to sail periodically on a nominated day of the week. Frequency delay is reduced as shippers are better able to coordinate their production schedules with these fixed day sailings.

It is not possible to quantify accurately the benefits of reduced frequency delay without a survey of shippers but, with current interest rates, the benefits are likely to be fairly minor. For example, if we assume that a reduction of one day is made in frequency delay on average to $15.4 billion in Australian liner exports (1992–93), then at an annual interest rate of 12 per cent the savings per year would be around $5.1 million.[9]

However, it is uncertain to what extent vessel operators have been able to maintain fixed day sailings on the Australian waterfront to date, especially at the time of the dispute affecting AS. Some vessel operators in discussion with the BTCE were not confident that waterfront reliability had improved sufficiently to maintain fixed day schedules.

### *Stochastic delay*

Improvements in waterfront reliability are most noticeable in decreased stochastic delay. Reduced stochastic delay produces benefits for shippers in the form of lower inventories required by importers, decreased

---

8. In mid-1993, the first fixed day weekly service was offered to South East Asia by the Australia South Asia Consortium (NYK, Lloyd Triestino, Hanjin Shipping and Regional Container Line). MISC, Nedlloyd and Mitsui OSK have also combined to offer a fixed day weekly service to Singapore and Port Klang in Malaysia. The recent rearrangement of the European conference service to Australia was reported to have the aim of providing a fixed day weekly service.
9. The data collected for the BTCE study into waterfront unreliability (BTCE 1990) implied an interest rate of 21 per cent for holding inventories in 1988. Data in Reserve Bank Bulletins indicate that, between 1988 and 1993, overdraft rates declined by 44 per cent suggesting that in 1993 the relevant interest rate for holding inventories was around 12 per cent.

financing costs for exporters, and reductions in land transport costs between wharf and warehouse.

**Reductions in inventory costs**

Increased waterfront reliability means that inventory levels at both ends of the transport leg can be reduced, for a given risk of running out of stock. This yields benefits of lower interest and storage costs.

For Australian importers, the benefit is a direct reduction in their inventory holding costs. Lead times for orders can be reduced with improved waterfront performance. This yields lower financing costs, at any given level of interest rates, because of a shorter time between the importer paying for the goods when the ship departs the overseas port and the goods being sold in Australia.

For Australian exporters, the benefit is largely indirect, being in the form of increased sales due to an effective reduction in the overall costs of their goods to overseas purchasers, because of the smaller inventories needed for any given level of risk of stock-outs. To the extent waterfront reliability is improved, exporters should be able to reduce their own inventories of product.

Australian exporters are often reliant on a proportion of imported inputs to their production, and must carry increased inventories of these commodities because of Australian waterfront unreliability. However, these costs are counted as part of the excess import inventory costs.

BTCE (1990) estimated that, with negligible risk from shipping and waterfront delays, import inventories could have been reduced by 12 per cent. BTCE (1990) did not attempt to estimate the effects on the export inventories of Australian exporters. The costs of excess import inventory were put at $272 million for interest at an implied rate of 21 per cent (BTCE 1990, p.40) and $42 million for storage.

In December 1993, business interest rates were about 56 per cent of those in June 1988 and import values in 1992–93 were some 94 per cent of those in 1987–88. At 1993 interest rates and volume of imports, excess inventory and storage costs are estimated to be about $185 million at 1988 levels of unreliability.[10]

---

10. $272 x 0.56 x 0.94 million + $42 million = $185 million.

Container and ro-ro ships lost on average 3.4 days (second quarter) and 4.5 days (fourth quarter) in 1988 (BTCE 1990).[11] In the second half of 1992, container ships spent only 1.05 days on average longer than planned on the Australian coast (Carlson 1993), a reduction of about three-quarters. At 1992 levels of waterfront reliability, the cost of excess import inventory would be about $46 million (25 per cent of $185 million), based on a reduction in ship delays from four days in 1988 to one day in 1992. This estimate is based on the assumption that excess inventories, or buffer stocks, held are proportional to average ship delays, and that storage costs are proportional to buffer stocks held. The estimated reduction in excess inventory costs between 1988 and 1992 is therefore $185 million minus $46 million, or $139 million per year.

However, as discussed in chapter 3, matters may have improved somewhat even before the waterfront reform process was fully under way. Had voyage planning in 1990 been on the same basis as in 1992, average delays would have been two days by the second half of 1990, which would have been halved by the second half of 1992. That is, excess inventory costs would have been about $93 million per year in the second half of 1990, based on the assumption of proportionality. The reduction in excess inventory costs during the course of the WIRA process would have been an estimated $47 million ($93 million minus $46 million).

Although a variety of causes could be responsible for the overall reduction in delays between 1990 and 1992—including the recession, port authority reform, towage reform, and the general attention being focused on the waterfront at the time—the stevedoring reform process is likely to have been the major single factor in the improvement in reliability.

However, it is conservatively assumed that only half the one day improvement in reliability achieved between 1990 and 1992 can be attributed to waterfront reform. The reduction in excess inventory costs due to waterfront industry reform is then estimated to be half of the $47 million overall reduction between 1990 and 1992; that is, $23 million per year.

---

11. Although 1988 appeared to be a particularly bad year because of the blockade of the port of Sydney by truck drivers, average delays to ships in 1987 were almost as long as in 1988 (3.1 days in the second quarter and 4.5 in the fourth quarter of 1987).

There is evidence that inventories have been reduced as a result of waterfront reform. Baker of P&O Containers Pty Ltd (1993, p.7) has said:

> Stockpiles not only can be reduced, but actually are being reduced, both in Australia for our imports, and overseas for Australia's exports ...

One ship operator told the BTCE that a client of the line had been able to reduce inventory by over 50 per cent of goods required for input to a production process. This is an especially large reduction in inventory; it is unlikely that many importers would have achieved the same improvements.

It is uncertain what effect industrial disputes during 1994 would have had on importers' inventory management behaviour and on Australia's exports. However, the Western Australian Shippers' Council pointed out that a reputation for improved reliability is hard-won but easily lost (pers. comm. 1994).

**Shorter transit times door to door**

Waterfront unreliability increases financing costs for exporters. Exporters normally must wait until the cargo is loaded on board the ship before they can claim payment from the buyer. Any delay to the ship in arriving at the port of loading and to the loading process after arrival in port delays the time the exporter can claim payment. Similarly Australian importers must pay the financing costs for their goods during the time ships are delayed. However, importers' financing costs are included in their inventory costs estimated above.

BTCE (1990) estimated excess transit times due to waterfront unreliability for export cargoes at 4.5 days to 9.2 days, depending on the trade route. This represents the maximum potential reduction possible in transit times with improved waterfront performance. Excess financing costs on various trade routes amounted to an estimated $146 million in 1988.

Excess financing costs would be significantly lower today even in the absence of waterfront reform. Given the substantial drop in overdraft interest rates between 1988 and 1993, current interest rates (12 per cent), would reduce the 1988 figure to approximately $83 million.

Between the second half of 1990, before the introduction of enterprise agreements, and the second half of 1992, after their introduction, the

time spent on the Australian coast by container ships was reduced by about 5 per cent, or 1 day,[12] on a trade weighted average basis. Reductions varied between 0.12 days (Europe and Other trades) and 1.84 days (Asian trades), with 0.67 days reduction in the USA trades.

The reduction of 1 day lies between 11 per cent and 22 per cent of the excess transit times of 4.5 to 9.2 days estimated by BTCE (1990). A reduction of 16 per cent is taken as typical, and would result in a reduction in excess transit costs of about $13 million of the current $83 million estimated above.

### Lower truck demurrage costs

The BTCE (1990) estimated the costs of excess truck waiting time in queues at the wharves due to waterfront unreliability at $20 million for exports and $33 million for imports in 1988. Average truck turnaround times were 1.88 hours in Melbourne and about 2.5 hours in Sydney, well in excess of the 30 minutes which was felt to be achievable. This corresponded, at a truck demurrage rate of $40 per hour, to about $55 per teu on average in Melbourne and about $80 per teu in Sydney at that time. These costs were largely borne by shippers who paid demurrage charges to truck operators. This symptom of waterfront unreliability resulted in an estimated $45 million decrease in national welfare in 1988 (BTCE 1990).

The situation had greatly improved by 1993, as reported in chapter 3. Compared with the 1988 turnaround times of 1.88 hours in Melbourne and 2.5 hours in Sydney, the 1993 levels of 45 minutes represented a reduction of excess turnaround times of 82 per cent for Melbourne and 87 per cent for Sydney. Weighted by teu throughput, an overall reduction of about 85 per cent was achieved.

At 1993 trade levels and rates of truck detention charges (about $50 per hour, according to the PMA), the 1988 level of truck delays would have caused a welfare loss of about $56 million. Therefore, the reductions achieved in truck turnaround times represent a welfare gain of about $47 million (85 per cent of $56 million) for existing cargoes. The total

12. However, there was also a 4 per cent increase in the number of port calls per vessel over this period. Therefore, improvements in Australian waterfront performance would have been responsible for a reduction in transit times of about 9 per cent, or 1.8 days, had the number of port calls not increased.

gains due to quality-of-service improvements are summarised in table III.4.

**TABLE III.4 SUMMARY OF QUALITY-OF-SERVICE IMPROVEMENTS**
*($ million)*

| *Savings category* | *Saving* |
|---|---|
| Reductions in frequency delay | 5 |
| Reductions in excess inventory costs | 23 |
| Shorter transit times door to door | 13 |
| Lower truck demurrage costs | 47 |
| **Total quality of service gains** | **88** |

*Source* BTCE estimates based on BTCE (1990, chapter 3).

**TABLE III.5 SUMMARY OF GAINS TO SHIPPERS IN 1993**
*($ million)*

| *Savings category* | *Savings* |
|---|---|
| **Containerised cargoes** | |
| Stevedoring prices | 73.4 |
| Vessel operating costs | 71.2 |
| Quality of service | 88.0 |
| Sub-total | 232.6 |
| **Non-containerised general cargoes** | |
| Stevedoring prices | 14.4 |
| Vessel operating costs | 19.9 |
| Sub-total | 34.3 |
| **Bulk cargoes** | |
| Stevedoring prices | 3.8 |
| Vessel operating costs | 5.2 |
| Sub-total | 9.0 |
| **Total** | **275.9** |

*Sources* Tables II.4, III.3, III.4.

## TOTAL GAINS TO SHIPPERS

The total gains to shippers (about $276 million in 1993[13]) are summarised in table III.5. Shippers of non-bulk cargo (containerised and non-containerised) gained about $267 million of this total in 1993 from Australian waterfront reform. Reductions in stevedoring prices represented only one-third of this total. The major gains have been in reduced vessel operating costs and quality-of-service improvements. Overall, the benefits of waterfront reform appear to have flowed through to Australian shippers to a large, though uneven, extent.

13. The ACTU in its submission to the Review of Part X (1993, p.8) estimated direct annual savings of at least $300 million.

# APPENDIX IV CRANE PRODUCTIVITY AND CRANE INTENSITY

Crane productivity at container terminals is a reasonable proxy for the productivity of the capital involved in the stevedoring process, as this equipment would constitute a large proportion of the stevedores' capital investment.

## DEFINITIONS

Crane productivity is measured by the crane rate, which was defined by WIRA as the number of teus moved per crane per hour of gross time.[1] However, the BTCE's *Waterline* bulletin bases its crane rates, from September 1993, on net time, which is WIRA's gross time less award shift breaks. Consequently, WIRA's crane rates are not strictly comparable with the new crane rate.

Crane intensity is the average over time of the number of cranes used simultaneously to work each vessel. It will have a major impact on the rate at which ships are worked.

Crane intensity may be calculated as follows:

$$\text{crane intensity} = \frac{\text{TEUs per net hour}}{\text{TEUs per crane hour}}$$

The improvement in crane productivity over the WIRA period effectively resulted in increased crane capacity and allowed terminal operators to increase the average number of cranes used per ship. This greater crane

intensity resulted in some ports experiencing rapid productivity improvements measured by the net rate (as discussed in chapter 3).

## CRANE RATES AND INTENSITIES

This section presents graphs of crane rates and crane intensities for the major Australian ports, individually and in aggregate. Table IV.1 at the end of this appendix gives time series of these parameters, as well as of the labour productivity parameters discussed in chapter 3.

### Five major ports

At the start of the WIRA process, crane rates ranged from 12.4 (Melbourne) to 15.8 (Adelaide). Crane productivity increased with the introduction of EAs, and average crane rates for the five major ports increased steadily from mid-1991, to be 50 per cent higher by the September quarter of 1992 than at the start of the WIRA period. By the end of WIRA crane rates fell in a much narrower range: from 19.1 (Adelaide) to 20.9 (Sydney).

By the March quarter of 1994, crane rates at four of the five major ports converged at around 20 teus per hour, much the same as the five-port average at the end of the WIRA process. The exception in the March quarter 1994 was Sydney (due to the dispute affecting AS), bringing the five-port average down to 18.8. In the June quarter 1994, the five-port average was slightly higher at 19.2 (see figure IV.1). Only Sydney (below) and Brisbane (above) differed significantly from the five-port average.

Over the WIRA period average crane intensity showed a general upward trend. Intensity rose 10 per cent from 1.20 in the December quarter of 1989 to 1.32 in the September quarter of 1992, despite an increase of 22 per cent in the number of ships handled per quarter over this period. This is a reflection of the increase in the effective capacity of the existing terminal cranes. Perhaps also there was increased flexibility in the workforce moving from working one vessel to working another.

Post-WIRA, average crane intensity in the five major ports recorded a new high of 1.35 in the September quarter of 1993 although the number of ships handled (683) was 63 per cent higher than in the September quarter of 1992. With a further strong rise in ship numbers in the December quarter of 1993, crane intensities fell to 1.27, indicating that for a higher proportion of time terminal crane capacity was fully utilised

by the 796 cellular ships handled. Intensity rose sharply in the March quarter 1994, with a fall to 745 in the number of ships handled. By the June quarter 1994, crane intensity was still 1.31, despite 814 cellular ships being handled in the five ports.

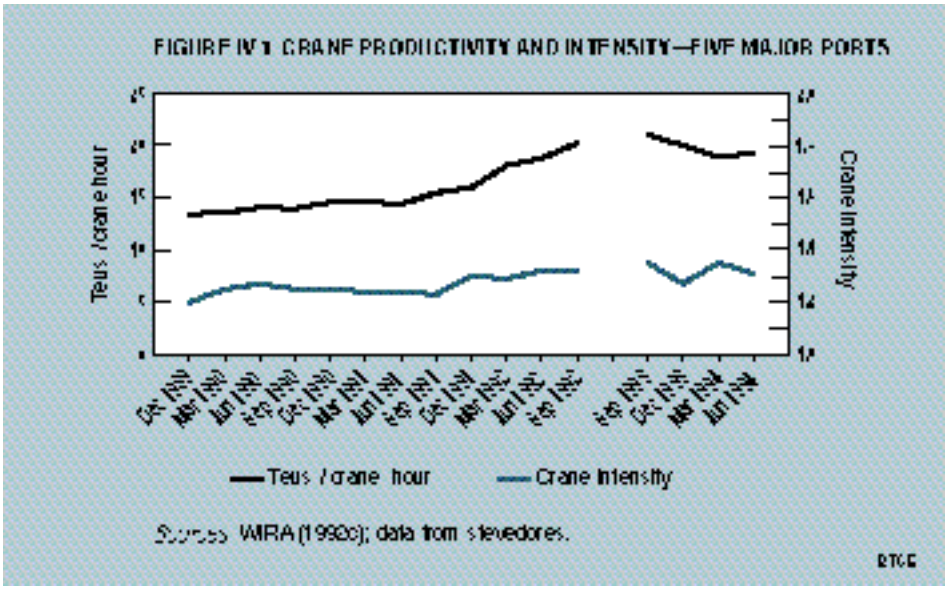



FIGURE IV.1 CRANE PRODUCTIVITY AND INTENSITY—FIVE MAJOR PORTS

Source: WIRA (1993c); data from stevedores.

## Sydney

Sydney's crane rates during the WIRA period conform to the pattern of the five-port average, with increases from mid-1991. At the end of WIRA, rates were 57 per cent higher than in the December quarter of 1989. Rates have since fallen somewhat (see figure IV.2), especially during the March quarter 1994, with the dispute affecting AS, when rates fell to 16.4. Sydney was the only port below the five-port average in the June quarter 1994.

Sydney began the WIRA process with crane intensity (1.08) well below those of Melbourne and Brisbane, and similar to that of Fremantle. By the end of the WIRA process, Sydney's crane intensity had increased by 34 per cent to 1.45, overtaking those of Melbourne and Brisbane. Post-WIRA, Sydney's crane intensity reached a high of 1.69 in the March quarter of 1994, before falling to 1.58 in the June quarter of 1994.

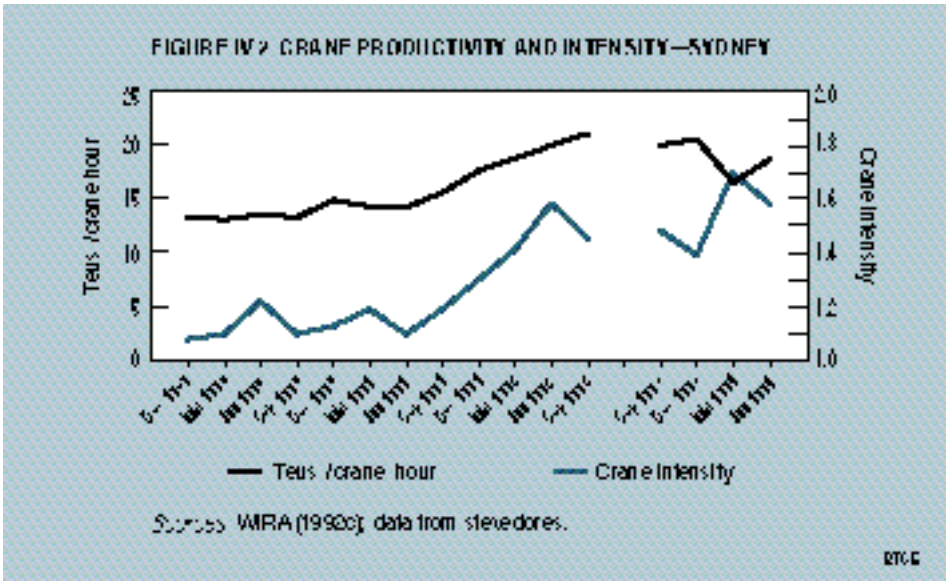



FIGURE IV.2 CRANE PRODUCTIVITY AND INTENSITY—SYDNEY

Source: WIRA (1990c); data from stevedores.

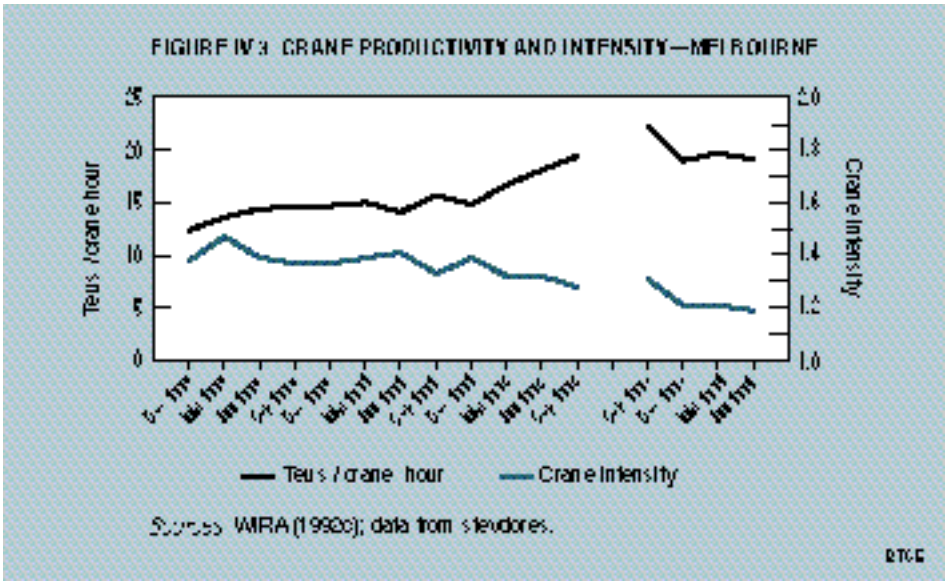
## Melbourne

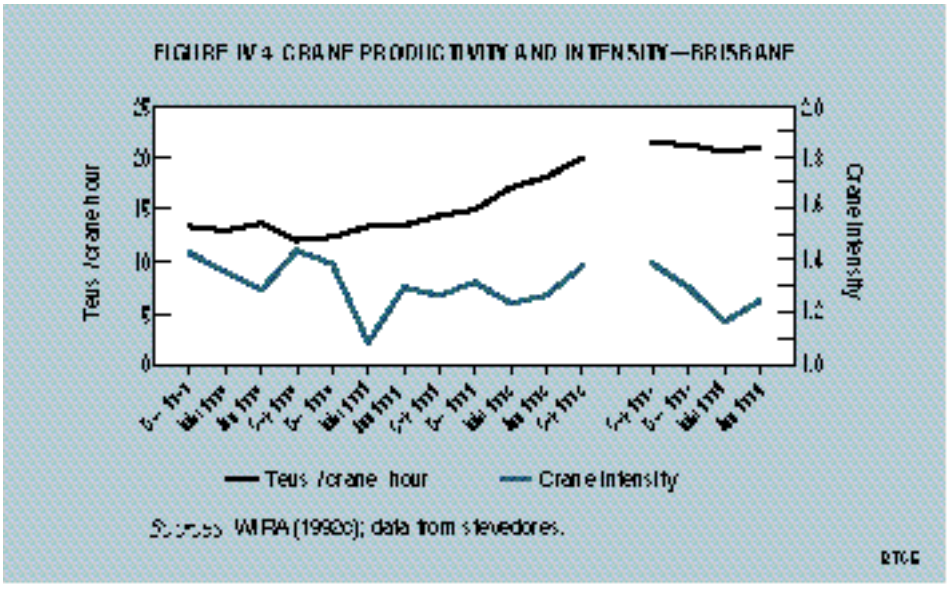
Melbourne's crane rate increased by 56 per cent over the WIRA period (see figure IV.3). Since the end of WIRA, the crane rate appears to have improved further, at least up to the September quarter of 1993. In the December quarter of 1993, due to some industrial problems, the crane rate fell significantly to a level below that at the end of the WIRA process, but recovered slightly in the March quarter 1994.

Melbourne began the WIRA period with a high crane intensity of 1.39, which fell to 1.28 at the end of the period. Post-WIRA, Melbourne's crane intensity rose marginally before falling again to 1.21 by the December quarter 1993, when ship numbers were almost three times as high as at the start of the WIRA period. By the June quarter of 1994, crane intensity had further declined to 1.19, despite having handled only 265 ships, compared with 306 in the December quarter 1993.

## Brisbane

Crane rates in Brisbane had a fairly steady improvement from late 1990, to be 49 per cent higher at the end of the WIRA process than at the start (see figure IV.4). This improvement appears to have continued past the end of the WIRA period, although rates appear to have plateaued at


Teus /crane hour
Crane Intensity
Teus /crane hour
Crane Intensity


Teus /crane hour
Crane Intensity
Teus /crane hour
Crane Intensity

about 20 to 21 teus per hour. In the June quarter of 1994, Brisbane had the highest crane rate (20.8) of the five major ports.

Brisbane's crane intensity experience was similar to that of Melbourne, although the fall in intensity over WIRA was smaller: from 1.43 to 1.38. A similar intensity was recorded in the September quarter of 1993 (1.39).

Crane intensity then fell sharply to 1.17 by the March quarter 1994, despite the number of ships handled being only slightly higher. Crane intensity rose somewhat in the June quarter 1994, despite a sharp rise (from 112 to 140) in the number of ships, and in the amount of container cargo, handled.

### Adelaide

Crane productivity in Adelaide seems to be particularly sensitive to the level of trade. Over the period 1989 to 1992, crane rates at Adelaide increased by 20 per cent — the smallest increase of the five major ports (see figure IV.5). However, Adelaide started from a higher base figure than the other ports, and its rate in the December quarter 1993 was still the second highest of the five major ports. Its rate then rose further, before declining to be the same in the June quarter 1994 as at the end of the WIRA period.

Adelaide's crane intensity increased from 1.22 to 1.46, but with considerable variation from quarter to quarter, over the WIRA period. The latest data show similar intensities to those at the end of the WIRA period, albeit still with considerable fluctuations, but with significantly more ship calls.

### Fremantle

Fremantle's average crane rates improved to be 46 per cent higher by the September quarter of 1992 than at the start of the WIRA period (see figure IV.6). March quarter 1994 rates were very slightly lower than at the end of the WIRA period, and June quarter 1994 rates were lower still.

In contrast to the other major ports, Fremantle's crane intensity remained virtually constant over the WIRA period, and the latest data show very similar rates. These intensities, which are the lowest of the five major ports, may be influenced by the current physical layout of the port. The

location of AS between the two Conaust areas is likely to hamper the redeployment of cranes between ships being handled by Conaust.

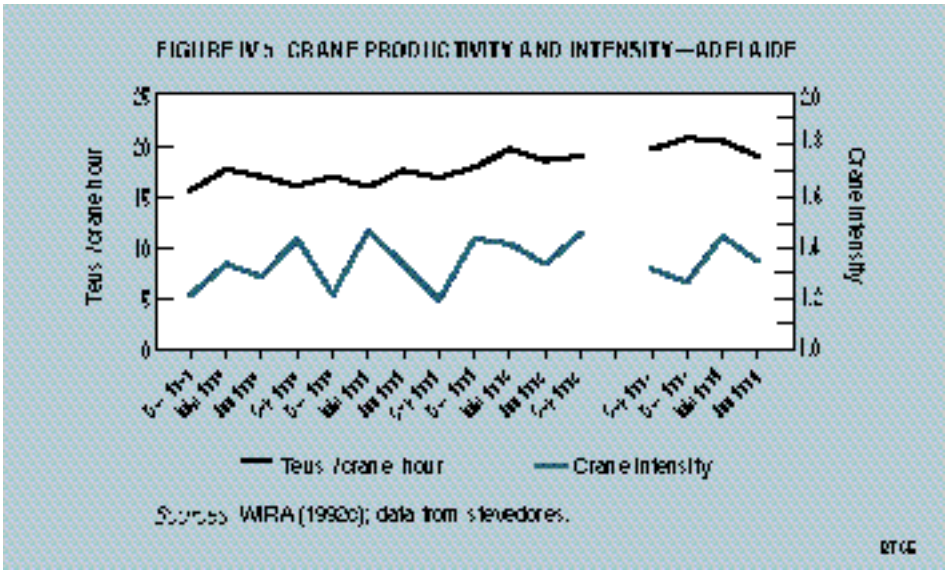



FIGURE IV.5 CRANE PRODUCTIVITY AND INTENSITY—ADELAIDE

Source: WIRA (1992c); data from stevedores.

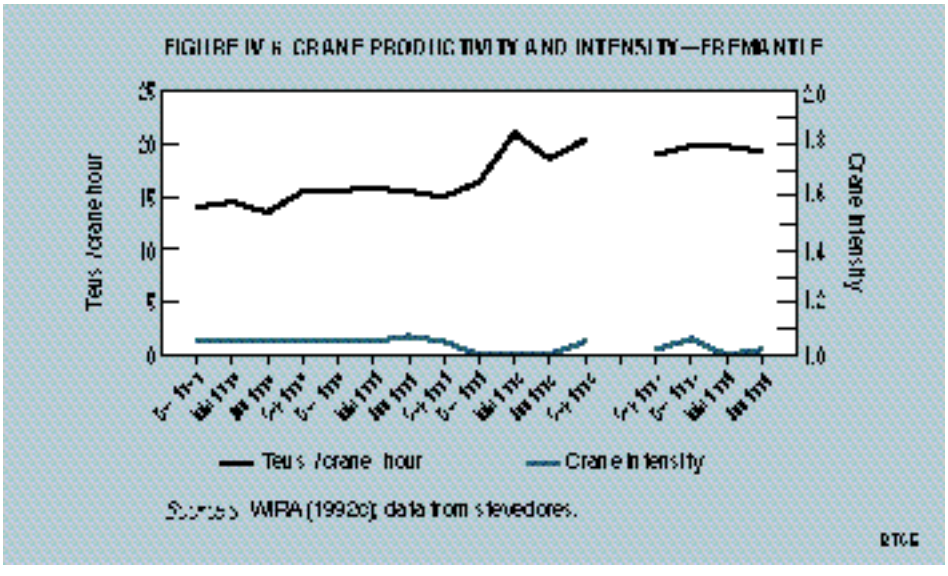



FIGURE IV.6 CRANE PRODUCTIVITY AND INTENSITY—FREMANTLE

Source: WIRA (1992c); data from stevedores.

**TABLE IV.1 STEVEDORING PERFORMANCE FOR FULLY CELLULAR SHIPS AT CONTAINER TERMINALS AT THE FIVE MAJOR PORTS, DECEMBER 1989 TO JUNE 1994[a]**

| | *Dec 89* | *Mar 90* | *Jun 90* | *Sep 90* | *Dec 90* | *Mar 91* | *Jun 91* | *Sep 91* | *Dec 91* | *Mar 92* | *Jun 92* | *Sep 92* | *Sep 93* | *Dec 93* | *Mar 94* | *Jun 94* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Five major ports** | | | | | | | | | | | | | | | | |
| Teus/elapsed hr | 13.5 | 14.2 | 15.3 | 15.0 | 14.9 | 15.7 | 15.4 | 16.4 | 17.8 | 19.4 | 20.7 | 23.1 | 23.4 | 21.0 | 19.2 | 19.9 |
| Teus/net hr | 16.1 | 17.0 | 17.7 | 17.3 | 18.0 | 18.2 | 17.7 | 18.9 | 20.6 | 23.3 | 24.7 | 26.5 | 28.2 | 25.4 | 25.0 | 25.0 |
| Crane rate[b] | 13.4 | 13.5 | 14.0 | 13.9 | 14.5 | 14.6 | 14.3 | 15.4 | 15.9 | 18.0 | 18.7 | 20.1 | 20.9 | 19.9 | 18.8 | 19.2 |
| Teus/person-shift | 1.8 | 1.3 | 1.3 | 1.4 | 1.5 | 1.3 | 1.5 | 1.7 | 2.7 | 2.3 | 2.4 | 2.4 | | | | |
| Crane intensity | 1.20 | 1.26 | 1.26 | 1.24 | 1.24 | 1.25 | 1.24 | 1.23 | 1.30 | 1.29 | 1.32 | 1.32 | 1.35 | 1.27 | 1.35 | 1.31 |
| **Sydney** | | | | | | | | | | | | | | | | |
| Teus/elapsed hr | 11.9 | 11.6 | 14.6 | 12.4 | 12.4 | 14.4 | 13.6 | 16.5 | 18.4 | 19.9 | 22.9 | 24.1 | 22.6 | 22.0 | 18.7 | 20.8 |
| Teus/net hr | 14.4 | 14.3 | 16.5 | 14.6 | 16.7 | 16.9 | 15.5 | 18.4 | 22.7 | 26.3 | 31.2 | 30.4 | 29.4 | 28.3 | 28.3 | 29.1 |
| Crane rate[b] | 13.3 | 13.0 | 13.5 | 13.2 | 14.8 | 14.2 | 14.1 | 15.5 | 17.5 | 18.6 | 19.8 | 20.9 | 19.8 | 20.4 | 16.4 | 18.5 |
| Teus/person-shift | 2.7 | 1.3 | 1.3 | 1.4 | 1.4 | 1.2 | 1.5 | 1.8 | 2.4 | 2.1 | 2.1 | 2.4 | | | | |
| Crane intensity | 1.08 | 1.10 | 1.22 | 1.10 | 1.13 | 1.19 | 1.10 | 1.19 | 1.30 | 1.41 | 1.58 | 1.45 | 1.48 | 1.39 | 1.69 | 1.58 |
| **Melbourne** | | | | | | | | | | | | | | | | |
| Teus/elapsed hr | 14.1 | 16.9 | 17.1 | 18.0 | 18.0 | 18.2 | 17.0 | 17.6 | 18.7 | 19.2 | 20.9 | 22.6 | 25.9 | 20.0 | 19.5 | 19.2 |
| Teus/net hr | 17.2 | 20.0 | 20.0 | 19.9 | 20.0 | 20.9 | 19.8 | 20.9 | 20.5 | 22.1 | 23.9 | 24.9 | 29.3 | 22.9 | 23.8 | 22.7 |
| Crane rate[b] | 12.4 | 13.6 | 14.4 | 14.6 | 14.7 | 15.0 | 14.1 | 15.7 | 14.8 | 16.7 | 18.1 | 19.4 | 22.3 | 19.0 | 19.7 | 19.1 |
| Teus/person-shift | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.1 | 1.2 | 1.4 | 2.4 | 2.4 | 2.4 | 3.4 | | | | |
| Crane intensity | 1.39 | 1.47 | 1.39 | 1.36 | 1.36 | 1.39 | 1.41 | 1.33 | 1.39 | 1.32 | 1.32 | 1.28 | 1.31 | 1.21 | 1.21 | 1.19 |

**TABLE IV.1 (CONT) STEVEDORING PERFORMANCE FOR FULLY CELLULAR SHIPS AT CONTAINER TERMINALS AT THE FIVE MAJOR PORTS, DECEMBER 1989 TO JUNE 1994[a]**

| | *Dec 89* | *Mar 90* | *Jun 90* | *Sep 90* | *Dec 90* | *Mar 91* | *Jun 91* | *Sep 91* | *Dec 91* | *Mar 92* | *Jun 92* | *Sep 92* | *Sep 93* | *Dec 93* | *Mar 94* | *Jun 94* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Brisbane** | | | | | | | | | | | | | | | | |
| Teus/elapsed hr | 17.3 | 16.0 | 14.8 | 15.1 | 15.1 | 13.4 | 16.3 | 16.9 | 17.8 | 19.6 | 21.2 | 25.6 | 26.6 | 24.6 | 20.9 | 22.6 |
| Teus/net hr | 19.0 | 17.6 | 17.4 | 17.3 | 17.0 | 14.5 | 17.4 | 18.2 | 19.6 | 21.1 | 22.9 | 27.4 | 29.4 | 27.5 | 23.9 | 25.9 |
| Crane rate[b] | 13.3 | 12.9 | 13.6 | 12.0 | 12.3 | 13.3 | 13.4 | 14.3 | 14.9 | 17.0 | 18.0 | 19.8 | 21.2 | 21.1 | 20.4 | 20.8 |
| Teus/person-shift | 2.0 | 1.6 | 1.6 | 1.8 | 2.0 | 1.7 | 2.0 | 2.2 | 2.2 | 2.1 | 2.6 | 2.8 | | | | |
| Crane intensity | 1.43 | 1.36 | 1.28 | 1.44 | 1.38 | 1.09 | 1.30 | 1.27 | 1.32 | 1.24 | 1.27 | 1.38 | 1.39 | 1.30 | 1.17 | 1.25 |
| **Adelaide** | | | | | | | | | | | | | | | | |
| Teus/elapsed hr | 18.7 | 23.2 | 20.8 | 22.3 | 19.7 | 21.7 | 23.2 | 19.6 | 25.3 | 27.2 | 24.4 | 25.9 | 23.1 | 25.5 | 27.8 | 24.7 |
| Teus/net hr | 19.3 | 23.8 | 22.0 | 22.3 | 20.8 | 23.7 | 23.7 | 20.5 | 25.9 | 28.2 | 25.0 | 27.9 | 26.1 | 26.6 | 29.8 | 25.7 |
| Crane rate[b] | 15.8 | 17.8 | 17.1 | 16.2 | 17.1 | 16.1 | 17.7 | 17.0 | 18.0 | 19.8 | 18.7 | 19.1 | 19.8 | 20.9 | 20.6 | 19.1 |
| Teus/person-shift | 1.7 | 0.9 | 0.9 | 0.8 | 1.4 | 1.5 | 1.3 | 1.3 | 1.4 | 2.3 | 2.3 | 3.0 | | | | |
| Crane intensity | 1.22 | 1.34 | 1.29 | 1.44 | 1.22 | 1.47 | 1.34 | 1.21 | 1.44 | 1.42 | 1.34 | 1.46 | 1.32 | 1.27 | 1.45 | 1.35 |
| **Fremantle** | | | | | | | | | | | | | | | | |
| Teus/elapsed hr | 11.8 | 12.1 | 11.8 | 12.4 | 12.8 | 12.9 | 12.9 | 12.1 | 13.1 | 16.8 | 15.1 | 18.2 | 13.1 | 15.5 | 15.2 | 14.6 |
| Teus/net hr | 14.7 | 15.2 | 14.2 | 16.3 | 16.4 | 16.3 | 16.6 | 15.8 | 16.4 | 21.0 | 18.6 | 21.4 | 19.4 | 21.0 | 19.8 | 19.5 |
| Crane rate[b, c] | 14.0 | 14.5 | 13.5 | 15.5 | 15.6 | 15.5 | 15.8 | 15.0 | 16.4 | 21.0 | 18.6 | 20.4 | 19.0 | 19.8 | 19.8 | 19.3 |
| Teus/person-shift | 2.6 | 2.5 | 2.6 | 3.1 | 3.5 | 2.7 | 2.8 | 2.6 | 3.2 | 3.8 | 3.0 | 3.2 | | | | |
| Crane intensity | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.00 | 1.00 | 1.00 | 1.05 | 1.02 | 1.06 | 1.00 | 1.02 |

a. Information for December 1992 to June 1993 quarters not available.

b. WIRA defined crane rate as teus per crane per hour of gross time. However, the BTCE's bulletin *Waterline* bases its crane rates, from September 1993, on net time: WIRA's gross time less award shift breaks.

c. Figures reported in *Waterline* for Fremantle for March and June 1991 have been revised.

*Sources* WIRA (1990); BTCE (1994).

# APPENDIX V CASE STUDY: GRAIN STEVEDORING

As part of a case study of grain ports, the BTCE visited the following three ports: Newcastle in New South Wales, Albany in Western Australia and Port Lincoln in South Australia.

## SUMMARY

Although there are major differences between the three ports in the way stevedoring is now arranged, operations in all three grain terminals have benefited significantly from the WIRA process. There have been large reductions in stevedoring staffing, implementation of more flexible working arrangements, and reductions in stevedoring costs.

The Australian Wheat Board (AWB) has estimated that savings to grain shippers from waterfront reform and continuous loading[1] were of the order of $35 million per year (AWB 1993a). However, BTCE estimates in chapter 4 and appendix III indicate that the major part of these savings has come from continuous loading.

Vessel operators have experienced reduced turnaround times to varying degrees, depending on the port involved, but inflexibilities in other port operations, such as those of tugs or mooring gangs, are now an impediment to greater savings.

---

1. Continuous running involves pouring not being stopped for meal and other breaks, which the workforce takes on a staggered basis. The time saved is not only the length of the breaks themselves, but also the start-up and wind-down times.

## GRAIN LOADING AND STEVEDORING ARRANGEMENTS

### Newcastle

In April 1993, Graincorp, the terminal operator in Newcastle, won the stevedoring contract let by the AWB. The integrated, multi-skilled terminal workforce now carries out most of the stevedoring functions,[2] as well as the normal terminal storage and handling role.[3]

The exception is the role of stevedoring supervisor, which is carried out by an employee of a stevedoring company, on an annual contract basis. Graincorp sends separate accounts to the AWB for stevedoring and for storage and handling. The Newcastle grain terminal workforce now is covered by the Maritime Union of Australia (MUA).

### Albany

In Albany, while the stevedoring contract is between the grain shipper (usually the Australian Wheat Board or the Grain Pool of Western Australia) and a stevedoring company, the latter uses labour supplied by the port authority. The Albany Port Authority's integrated port labour force (IPLF)[4] now carries out most of the stevedoring functions, as well as its normal port operations and maintenance role.

Again, the exception is the role of stevedoring supervisor. The IPLF is covered by the MUA, and works an eight-hour shift, rather than the seven-hour shift previously worked by port authority workers. This now matches the shifts of the workforce of the terminal operator, Co-operative Bulk Handling Limited (CBH).

---

2. Some grain shipments are still made on a straight fob basis, rather than the 'fob stowed and trimmed' basis on which Australian Wheat Board sales are now generally made. In these cases, a private stevedoring company will perform the entire stevedoring operation on contract to the grain shipper, while the terminal employees operate the pouring spouts from the gantry control cabins, rather than by remote control from the deck of the ship.
3. This system also operates at Mackay, Gladstone and Brisbane.
4. The Western Australian government instituted the IPLF system in various State regional ports, including Albany, Esperance, Geraldton, Bunbury, Broome and Wyndham, in October 1992.

**Port Lincoln**

In Port Lincoln, the stevedoring is carried out by a stevedoring company on a contract basis, generally for the AWB or the Australian Barley Board (ABB). These are the principal clients of South Australian Co-operative Bulk Handling Limited (SACBH), the terminal operator. In this port, the port authority operates the bulk loading plant, which consists of a link belt into the terminal, the wharf conveyor system and the loading spouts.

## STEVEDORING STAFFING

Stevedoring staffing for grain in the three ports studied has been substantially reduced. From a supervisor plus nine to twelve workers pre-WIRA, staffing is down to a supervisor plus one or two workers now, when free pouring using one or two spouts (see table V.1). Normal loading at Albany and Port Lincoln involves the use of one or two spouts, but can involve four at Newcastle. More labour may be required for trimming out, that is, the final filling of holds.

In real terms, therefore, the staffing of the stevedoring function has been reduced by almost 75 per cent on average in the three ports since pre-WIRA days. WIRA data show reductions of 70 per cent for Newcastle between the first half of 1990 and the last six months of 1993. WIRA data show reductions of 51 per cent for Albany, and 58 per cent for Port Lincoln, between the first half of 1990 and the last three quarters of 1992, for first-port loading.

In Newcastle, where the terminal workforce performs the stevedoring, the four or five workers allocated to the ship's deck include the pouring spout operators, who operate from the deck of the ship using remote control units; in the other two ports these functions are performed by terminal employees rather than the stevedore's employees. For stevedoring per se, in Newcastle there are two hatchworkers plus a supervisor when two hatches are being worked. When four spouts are being used, six terminal employees are rostered on deck.

There was widespread agreement among the waterfront participants interviewed that stevedoring staffing had now been reduced to a minimum consistent with safety. However, the General Manager of the Albany Port Authority questioned the need for continuing involvement of supervisors from the private stevedoring companies, once the pilots now employed by the Department of Harbours and Marine had been brought within the IPLF structure.

**TABLE V.1 COMPARISON OF GRAIN TERMINALS**

| | *Newcastle* | *Albany* | *Port Lincoln* |
|---|---|---|---|
| Storage operator | Graincorp | Co-operative Bulk Handling Limited | SA Co-operative Bulk Handling Limited |
| Conveyor operator | Graincorp | CBH Ltd | Port Authority |
| Loading spout operator | Graincorp | Port Authority IPLF | Port Authority |
| Stevedoring labour (on ship's deck) | Graincorp | Port Authority IPLF | Stevedoring company |
| Stevedoring supervision | Stevedoring company | Stevedoring company | Stevedoring company |
| Number of spouts | 4 | 2 | 2 |
| Nominal loading rate | 4000 tph | 1600 tph | 4000 tph |
| Running | Continuous | Not continuous | Continuous |
| **Stevedoring staffing:** | | | |
| **Pre-WIRA** | | | |
| | supervisor from stevedoring company | supervisor from stevedoring company | supervisor from stevedoring company |
| | up to 13 workers from stevedoring company, but about 10 on average | 1 foreman 8 workers from stevedoring company | 2 foremen 10 workers from stevedoring company |
| Total stevedoring staffing | 11 | 10 | 13 |
| **Post-WIRA** | | | |
| | supervisor from stevedoring company<br>up to 7 workers from the terminal on deck, but usually 4 or 5 including loader spout operators (the latter a terminal, rather than a stevedoring, function) | supervisor/foreman from stevedoring company<br>2 workers from stevedoring company | supervisor from stevedoring company<br>2 workers from stevedoring company |
| Total stevedoring staffing | 3 or 4 | 3 | 3 |

*Sources* AWB (1993a); Graincorp, CBH and SACBH (pers. comm. 1994).

To put stevedoring labour requirements in context, the total workforce involved in the storage, handling and stevedoring functions is 36 in Newcastle (Graincorp pers. comm. 1994), and 53 in each of Albany and Port Lincoln (AWB 1993a).

## CONTINUOUS RUNNING

Newcastle adopted continuous running (usually on a two-shift basis) in 1986, before the WIRA process. SACBH in Port Lincoln adopted continuous running (also on a two-shift basis) about four years ago, in the more flexible WIRA environment. The ABB recently called for 24-hour loading at South Australian grain ports (*Lloyd's List Australian Weekly* 1994).

CBH in Albany has said that the introduction of the IPLF has made continuous running feasible, and it will be trying to negotiate this under the review of its EA. Already, without continuous running, CBH has gained about 3 hours 40 minutes pouring time over three shifts, because the IPLF workforce has amended its shift hours and work breaks to match those of the CBH workforce.

## LOADING RATES

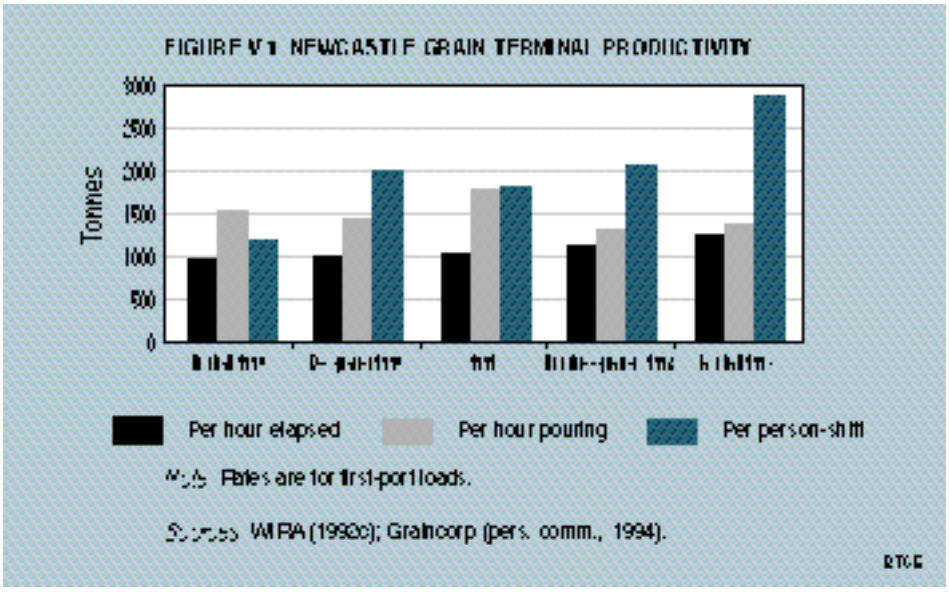
### Newcastle

WIRA data show that, in Newcastle, loading rates per elapsed hour have increased by 32 per cent from the six months to June 1990 to the six months to December 1993, for first-port loads. There has been a steady improvement since 1991 in rates for first-port loads (figure V.1). Rates per hour pouring were highest in 1991, when average cargo loadings were largest.[5]

Average tonnes per person-shift in Newcastle increased by 147 per cent from the six months to June 1990 to the six months to December 1993, not counting the two loader spout operators as part of stevedoring staffing.

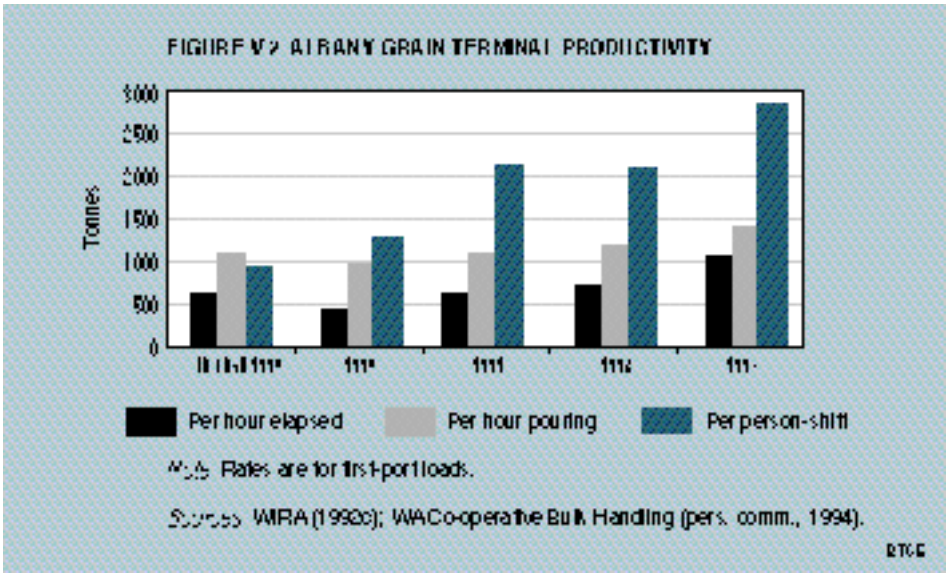
---

5. Tonnes per hour pouring were 14 per cent lower in the last half of 1993 than in the six months to June 1990, which in turn were 14 per cent lower than in 1991. These lower rates may be explained, at least in part, by lower average loadings, only 38 per cent and 74 per cent respectively of those in 1991.




## Albany

CBH in Albany stated that its loading rates per shift have increased from 8000–8500 tonnes per shift, due to the



extra pouring time as a result of matching shift hours and work breaks with the port authority's IPLF. This is an increase of 18 per cent to 25 per cent. However, data supplied by CBH head office show 8872 tonnes per shift in the December quarter 1993, an increase of 19 per cent over the same quarter in 1992. The average for 1993 was 8603 tonnes per shift, an increase of 40 per cent over 1990.

WIRA data show that, for first-port loads, tonnes per hour elapsed and per hour pouring increased by 62 per cent and 22 per cent respectively between 1990 and the first three quarters of 1992. CBH data show that these rates rose markedly in 1993, to be 145 per cent and 45 per cent higher respectively than in 1990 (figure V.2).Tonnes per person-shift increased steadily due to the reduction in average staffing, to be almost two-and-three-quarter times higher in 1993 than in 1990 for first-port loads. Tonnes per person-shift for second-port loads in 1993 were 57 per cent higher than those in 1990, and almost three times as high as those in the first half of 1990.

Port authority data (from the 1992–93 annual report) showed average tonnes of grain loaded per hour at berth increased 20 per cent from 394 in 1989–90 to 471 in 1992–93. The Albany port general manager estimated that productivity under the IPLF, introduced in 1992, had increased by 35 per cent. Corroborating this, CBH data show productivity increases of 51 per cent (elapsed time basis), 19 per cent (pouring time basis), and 35 per cent (person-shift basis), from 1992 to 1993.

**Port Lincoln**

SACBH stated that it has gained about one hour pouring per day (two-shift operation) due to continuous pouring. WIRA data show that Port Lincoln terminal achieved a 48 per cent increase in tonnes per hour elapsed between the last half of 1990 and the first three quarters of 1992, whereas tonnes per hour pouring increased by only 9 per cent for first-port loads. For second-port loads, both rates increased by 25–30 per cent.

Based on WIRA data, average tonnes per stevedoring person-shift in Port Lincoln increased by 158 per cent from the six months to June 1990 to the first three quarters of 1992, for first-port loads, and more than trebled for second-port loads.

Data supplied by SACBH for the 12 months ended 30 September 1993 and for the 7 months ended 29 April 1994 were not comparable with the earlier WIRA data. Firstly, the data did not distinguish between first-port

and second-port loadings. Secondly, the data allowed only rates per gross hour and per hour net of all delays, rather than per hour elapsed and per hour pouring. However, the rate per hour pouring should fall between the rate per hour gross and the rate per hour net (net of all delays).

Given these limitations, it appears that there was no improvement in hourly pouring rates in Port Lincoln in the year after the end of WIRA, and it is likely that rates fell. However, it is not possible to be definitive about this. On SACBH's data there was a falling away in late 1993 and early 1994 from the levels of the previous 12 months in rates, on both a gross hours basis and a net hours basis.

## VESSEL TURNAROUND TIMES

### Newcastle

Average turnaround time in Newcastle has fallen from about 4.5 days five years ago to about 1.5 days now, in part because the AWB is prepared to pay overtime. However, average loadings are also smaller: in the last half of 1993 the average loading (13 000 tonnes) was just over half that (25 000 tonnes) in the first half of 1990. Newcastle is usually a two-shift operation.

Based on WIRA data for first-port loadings, average elapsed hours declined from 26 in the first half of 1990 to 11 hours in the last half of 1993, a reduction of 58 per cent. Hours pouring declined 38 per cent from 16 to 10 on average for first-port loadings.

### Albany

In Albany, for an average first-port loading of about 25 000 tonnes, CBH said that the loading time has decreased from about 3 shifts to about 2.5 shifts. The port's general manager said that vessel turnaround had dropped from two or two-and-a-half days to about one-and-a-half days. Albany terminal is a three-shift operation.

Estimates based on WIRA data show average elapsed hours for first-port loadings decreased from 51 in 1990 to 25 hours in 1993, a decrease of 51 per cent, despite an increase in size of the average first-port loading

from 23 000 to 27 000 tonnes. Hours pouring decreased on average by 17 per cent from 23 to 19 hours.

The port's general manager stated that changes in vessel turnaround time depended on what shifts the shipper was prepared to pay for.

### Port Lincoln

In Port Lincoln the port manager and a shipping agent felt that improvements in turnaround times had been minor. Lack of flexibility in ordering mooring gangs, tugs and pilots may be an impediment to realising the potential gains in vessel turnaround times from improved grain loading performance.

Estimates based on WIRA data show average elapsed hours for first-port loadings decreased from 37 hours in the first half of 1990 to 28 hours in the last half of 1993, a decrease of 24 per cent. Hours pouring increased 5 per cent from 21 to 22 hours on average, while average first-port loadings increased 12 per cent from 34 000 to 38 000 tonnes.

## STEVEDORING COSTS

In Newcastle, stevedoring costs were stated by the terminal manager to have fallen by about half, from 40–50 to 20–25 cents per tonne.

The Western Australian Department of Transport has estimated that the introduction of the IPLF has reduced costs at the port of Albany by 42 per cent, via a reduction of 53 per cent in the total of the port and stevedoring workforces. The general manager at the port of Albany stated that the port authority had passed its savings on to port users via a reduction in the cost of shipping grain (wharfage) from $1.25 to $1.15. The costs of stevedoring paid by CBH could also be expected to have fallen in line with the national average reduction for grain terminals (which the AWB has said is about 50 per cent), due to the reduced staffing.

In Port Lincoln, stevedoring costs of 18 to 20 cents per tonne were cited by a local shipping agent. The agent said that, while stevedoring costs had not come down at a rate commensurate with recent reductions in staffing, grain stevedoring costs were now a minor item compared with the costs of tugs or pilotage. Stevedoring costs for grain at the time were also minor compared with wharfage (which was $1.50 per tonne in South Australia).

The Port Lincoln stevedore said that stevedoring rates had fallen from dollars per tonne 10 years ago to cents per tonne; a change in the typical ship from a twin-decker (requiring much more stevedoring effort) to a proper bulk carrier had greatly assisted in this.

# APPENDIX VI TERMS OF REFERENCE

## PURPOSE AND SCOPE

To examine the nature of the reforms that have been put in place, how they have affected efficiency on the waterfront and the extent to which the benefits of the program can be expected to continue.

## KEY ISSUES

1. The nature of the reforms that have been implemented, including those at international depots, small ports and bulk terminals.
2. How the change to enterprise-based employment has affected the size and age distribution of the stevedoring workforce.
3. Details of the new job structures and training programs that have been put in place.
4. How the changed arrangements have facilitated improved productivity, efficiency and reliability.
5. The extent to which the benefits of stevedoring reform have flowed to the users of shipping services.
6. The extent to which the benefits of the reform program have been maintained beyond the expiry of the In-Principle Agreement.

**PRINCIPAL AUDIENCE FOR EVALUATION FINDINGS AND RELATIONSHIP TO OTHER EVALUATIONS**

Government, stevedoring employers, stevedoring unions and shippers.

The evaluation will draw on:

- the results of the review of the In-Principle Agreement by WIRA, the stevedoring employers, stevedoring unions and the ACTU which is due for completion in November 1992; and
- relevant reports by the Prices Surveillance Authority including their 1992 *Inquiry into Land Based Charges in Australian Ports by Ocean Carriers and Conferences.*

## GLOSSARY

| *Term* | *Meaning* |
|---|---|
| breakbulk cargo | Non-containerised cargo, generally in the form of pallets, boxes, bags, coils, bundles, vehicles etc. |
| bulk cargo | Cargo, other then general cargo such as grain, which is not packaged into units before loading onto the ship. |
| bulk terminal | A terminal which loads or unloads bulk cargo. |
| chartered vessel | Hired from a vessel operator for a specific voyage or for a specific period of time. |
| cif | Cost, insurance and freight; that is, the total cost to the customer, including delivery. |
| depot | Area where LCL containers are packed or unpacked. |
| containerised cargo | Cargo carrier in standardised steel boxes (20 feet or 40 feet long, and 8 feet wide and high). |
| container depot | Where containers with cargo for more than one shipper (that is, LCL containers) are unpacked. |
| continuous loading | Loading of bulk commodities, which does not stop for workers' meal breaks or smokos. |
| crane intensity | Average over time of the number of cranes used to work each vessel. |
| crane rate | Teus handled per crane per net hour. |

| Term | Meaning |
|---|---|
| demarcation dispute | A dispute between members of different unions as to which has the right to perform certain work. |
| double header | Two shifts worked successively. |
| elapsed time | The time elapsed between the start of stevedoring and its completion. |
| enterprise agreements | Agreements between an employer and his employees, who are usually represented by their union, on conditions of employment and work practices. |
| excess capacity | The capacity to supply an amount of a good or service in excess of current demand. |
| FCL | Full container load; that is, a container containing cargo for only one shipper. |
| fixed day sailings | Sailings from a given port on a specified day of the week for each voyage. |
| frequency delay | The difference between the most desired departure time and the closest schedule departure. |
| fob | Free-on-board; ie the seller incurs all charges up to and including delivery of goods over the ship's rail. The purchaser pays for the sea carriage and unloading of the cargo. |
| foreigners | Shipper and vessel operator firms operating from overseas rather than from Australia. |
| freight rate | The amount paid to a carrier for carriage between specified points. |
| gross time | Elapsed time minus time unable to work due to: ship's fault or ship operator's request, weather, awaiting cargo, industrial disputes, and public holidays. |
| idle time | Time when no work is available, for which stevedoring workers receive idle time payments. |

| Term | Meaning |
|---|---|
| incentive payments scheme | System of payments under which bonuses are earned for exceeding a specified production rate. |
| independent operator | A liner operator not a member of a conference. |
| integrated port labour force (IPLF) | The combination of the port labour force and the stevedoring labour force into a single functional unit. |
| LCL | Less-than-container load; ie containers with cargoes for more than one shipper. The opposite to FCL. |
| liner operator | An operator of scheduled sea freight services. |
| liner conferences | Cartel-like groups of liner operators which cooperate to fix prices, and which may allocate market shares, and pool costs or revenues. |
| multi-skilling | Training a worker to perform a variety of tasks within a functional area, or to perform tasks in more than one functional area: for example, training a clerical worker to also perform cargo handling tasks. |
| net time | Gross time minus award shift breaks. |
| non-waterside labour | Stevedore labour who are members of unions which traditionally did not provide waterside labour. |
| port infrastructure | The improvements to a port, including dredging, buildings and capital equipment, such as cranes. |
| port pricing additional | A charge to shippers by vessel operators in response to the move, by some major Australian ports, away from wharfage charges towards ship-based charges. |
| productivity | A measure of the output achieved by a unit of input to the production process. |

| Term | Meaning |
|---|---|
| reefer | Refrigerated cargo or container. |
| reliability | A measure of the variability or predictability of performance levels. |
| ro-ro | Roll on, roll off [ship]. |
| supplementary labour | Casual, rather than permanent, stevedoring labour, employed as required. |
| ship turnaround time | Time between ship entering port and leaving port. |
| shipper | One having a contractual or other arrangement with a vessel operator for the carriage of goods. |
| slow steaming | A speed less than the vessel's normal operating speed, adopted to time an arrival at a port. |
| stevedoring | The loading and unloading of ships' cargoes. |
| teu (20-foot equivalent unit) | Shipping container 20 feet x 8 feet x 8 feet. Forty-foot containers (feus) are also used and one feu is therefore equal to two teus. |
| terminal | Wharf and adjoining area where containers are loaded or unloaded from container ships. |
| THC | Terminal handling charge. Charge levied in the Europe to Australia and North America to Australia inwards trades to recoup a proportion of the vessel operators' stevedoring costs for the trade, including those for empty containers. |
| time served indentures | A written agreement, covering duties and obligations, that governs the relationship between a master and an apprentice. |
| truck demurrage costs | Charges by a truck operator to the customer for time spent waiting to pick up or deliver his cargo. |
| waterside labour | Stevedoring labour who are members of the WWF and other unions which traditionally provided waterside labour. |

# REFERENCES

**Abbreviations**

| | |
|---|---|
| AAPMA | Association of Australian Ports and Marine Authorities |
| ABS | Australian Bureau of Statistics |
| AIC | Australian Industries Commission |
| ACTU | Australian Council of Trade Unions |
| AEWL | Association of Employers of Waterside Labour |
| AGPS | Australian Government Publishing Service |
| ANL | Australian National Line |
| ANZDL | Australia New Zealand Direct Line |
| APSA | Australian Peak Shippers' Association |
| ATAC | Australian Transport Advisory Council |
| ATC | Australian Transport Council |
| AUSCLA | Australia United States Container Line Association |
| AWB | Australian Wheat Board |
| BIE | Bureau of Industry Economics |
| BTCE | Bureau of Transport and Communications Economics |
| BTE | Bureau of Transport Economics |
| *DCN* | *Daily Commercial News* |
| DoTC | Department of Transport and Communications |
| EA | Enterprise agreement |
| IRC | Industrial Relations Commission |
| ISC | Inter-State Commission |

| | |
|---|---|
| MAMSAAL | Metals and Minerals Shippers' Association of Australia Ltd |
| NYK | Nippon Yusen Kaisha |
| PSA | Prices Surveillance Authority |
| SCS | Shipping Conference Services Ltd |
| TPC | Trade Practices Commission |
| WIRA | Waterfront Industry Reform Authority |
| WISG | Wool Industry Shipping Group |
| WWF | Waterside Workers Federation |

ABS, *Shipping and Air Cargo Commodity Statistics*, Cat. no. 9206.0, various years, ABS, Canberra.

—— *Foreign Trade Australia, Merchandise Exports*, Cat. no. 5424.0, various years, ABS, Canberra.

—— 1992, *Australia Year Book 1992*, Cat. no. 1301.0, ABS, Canberra.

—— 1993, *Labour Force Survey; Supplementary Survey*, ABS, Canberra.

ACTU 1993, submission to the Part X Review, no.44, ACTU, Canberra.

AEWL 1989a, *AEWL Annual Report 1988/89*, AEWL, Sydney.

—— 1989b, *AEWL Industry Statistics Report (monthly)*, AEWL, Sydney.

—— 1990a, *AEWL Stevedoring Industry Statistics March Quarter 1990*, AEWL, Sydney.

—— 1990b, *AEWL Stevedoring Industry Statistics June Quarter 1990*, AEWL, Sydney.

—— 1990c, *AEWL Stevedoring Industry Statistics September Quarter 1990*, AEWL, Sydney.

—— 1990d, *AEWL Stevedoring Industry Statistics December Quarter 1990*, AEWL, Sydney.

—— 1990e, *AEWL Annual Report 1989/90*, AEWL, Sydney.

—— 1991a, *AEWL Stevedoring Industry Statistics March Quarter 1991*, AEWL, Sydney.

—— 1991b, *AEWL Stevedoring Industry Statistics June Quarter 1991*, AEWL, Sydney.

—— 1991c, *AEWL Annual Report 1990/91*, AEWL, Sydney.

—— 1993, *AEWL Annual Report 1992/93*, AEWL, Sydney.

ANL 1993, submission to the Part X Review, no.15, ANL, Canberra.

ANZDL 1993a, *Australia-New Zealand Direct Line and waterfront reform: Impacts and implications*, report prepared by the Centre for Transport Policy Analysis, Wollongong.

—— 1993b, submission to the Part X Review, no.13, ANZDL, Canberra.

APSA 1993, submission to the Part X Review, no.10, APSA, Canberra.

ATAC 1993, *Port Performance Indicators, December 1992*, and earlier issues, ATAC, Canberra.

ATC 1993, *Port Performance Indicators, June 1993*, and earlier issues, ATC, Canberra.

AUSCLA 1993, submission to the Part X Review, no.49, AUSCLA, Canberra.

Australian Stevedores 1993, submission to the Part X Review, no.43, Xerox, Australian Stevedores, Canberra.

AWB 1993a, *Grain Storage Handling and Transport, Performance Indicators, Part 1 — Ports and Port Terminals (Elevators)*, AWB, Melbourne.

—— 1993b, submission to the Part X review, AWB, Canberra.

Baker, D.J. 1993, 'Ports, improving competitiveness and maximising efficiency', paper presented to AIC Ports Conference, August, Sydney.

BHP Transport 1993, submission to the Part X Review, no.25, BHP Transport, Canberra.

—— 1994, 'Stevedoring benchmarking study mark III', *Ironships*, November, pp.8–9.

BIE 1993, *International Performance Indicators, Waterfront*, Research Report 47, AGPS, Canberra.

Bos, D. 1989, *Public Enterprise Economics: Theory and Application*, Elsevier Science Publishing, Amsterdam.

Brazil report 1993, *see* Part X Review Panel.

BTCE 1988, *Economic Significance of the Waterfront*, Information Paper 29, AGPS, Canberra.

—— 1990, *The Costs of Waterfront Unreliability in 1988*, Occasional Paper 101, AGPS, Canberra.

—— 1993a, *The Progress of Aviation Reform*, Report 81, AGPS, Canberra.

—— 1993b, *Port Interface Cost Index*, Report 84, AGPS, Canberra.

—— 1994, *Waterline*, Issue No. 1, July, AGPS, Canberra.

BTE 1986, *Liner Shipping Services into and out of Australia*, Report 60, AGPS, Canberra.

Burgess, A. 1994, 'Getting on with business', speech presented on behalf of Conaust Ltd at AAPMA 34th Biennial Conference Brisbane, 9–11 October.

Carlson, A. 1993, 'Monitoring the Australian waterfront: port performance and reliability', paper presented to the Australasian Transport Research Forum, Surfers Paradise.

—— 1994, 'Australian waterfront reforms and the reliability of international liner shipping schedules', unpublished, BTCE internal paper.

Cassidy, P. 1982, 'Australian overseas cargo liner shipping: an economic policy analysis', unpublished PhD thesis, University of Queensland, Brisbane.

Containerisation International, 1993, 'Balancing act', *Containerisation International*, December, pp.31–33.

Davis, M. 1994, 'Stevedores take legal action against strikers', *Financial Review*, 15 July, p.3.

DCN 1994a, 'Misreading Part X report', *DCN*, 21 February.

—— 1994b, 'Moves on US–NZ meat trade', *DCN* 28 April, p.4.

—— 1994c, 'Tilley looks beyond the horizon', *DCN*, 22 June, p.16.

Dee, P. 1994, 'Microeconomic reforms in Australia and overseas — a salter model analysis', paper prepared for the EMBA/EPAC model comparison conference and microeconomic reform, Canberra, 13 April 1994.

Devine, P.J., Jones, R.M., Lee, N. & Tyson, W.J. 1976, *An Introduction to Industrial Economics*, 2nd edn, George Allen and Unwin, London.

DoTC 1990, *Stevedoring Statistics, Stevedoring Labour Review September 1989*, DoTC, Canberra.

—— 1992, 'Review of arrangements for waterfront performance monitoring', unpublished, departmental education program paper, DoTC December.

Douglas, G.W. & Miller, J.C. 1974, *Economic Regulation of Domestic Air Transport: Theory and practice*, The Brookings Institution, Washington D.C.

EA 1992, Various enterprise agreements from 1991 to 1992.

Erg, J. 1993, 'Eliminating trade barriers to our primary exports', *Australasian Ships & Ports*, December, p.26.

Evans, P. 1993, 'Shipper involvement in the transport chain', consultancy report by Mr Peter Evans, 17 June.

Farynski, J. 1994, 'CTAL workers slam claims on productivity', *DCN*, 30 November, p.3.

Harvey, M. 1993, 'Review of Part X of the *Trade Practices Act 1974*: an assessment of the economic issues', printed as appendix C of *Liner shipping, Cargoes and Conferences, Report of the Part X Review Panel*, AGPS, Canberra.

IRC 1986, *Waterside Workers Award 1983, Conciliation and Arbitration Act 1904*, W001 Rep M Print G1811, Commonwealth Government Printer, Canberra.

ISC 1988a, *Waterfront Investigation–Preliminary Findings and Discussion Papers, vol. 1*, AGPS, Canberra.

—— 1988b, *Waterfront Investigation: Preliminary Findings and Discussion Papers; Employment Arrangements*, vol.3, AGPS, Canberra.

—— 1988c, *Waterfront Investigation: Preliminary Findings and Discussion Papers; Industry Structures*, vol. 4, AGPS, Canberra.

—— 1989a, *Waterfront Investigation: Conclusions and Recommendations*, vol.1, AGPS, Canberra.

—— 1989b, *Waterfront Investigation: Conclusions and Recommendations*, vol.2, AGPS, Canberra.

Kirby, R. (Chairman) 1977, *Report of the National Stevedoring Industry Conference*, National Stevedoring Industry Conference.

Liebenstein, H. 1966, 'Allocative efficiency vs. X-efficiency', *American Economic Review*, vol.56, June, pp.392–415.

Lloyd's List Australian Weekly 1994, 'SA grain industry renews calls for 24-hour loading', *Lloyd's List Australian Weekly*, 23 May, p.20.

Lloyd's Shipping Economist 1994a, 'Lloyd's Maritime Ship Fixtures 1994' *Lloyd's Shipping Economist*, May.

—— 1994b, 'Too many large containerships', *Lloyd's Shipping Economist*, August, pp.6–9.

Makin, B. 1990, 'A reliable and efficient waterfront: industry challenge and national imperative', G.Dip.(Bus.)Thesis, AMC.

MAMSAAL 1993, submission to the Part X Review, no.20, MAMSAAL, Canberra.

Maritime Workers' Journal 1994a, '300 recruits in 10 ports', *Maritime Workers' Journal*, vol.2 no.9, pp.4–7.

—— 1994b, 'Workaholics no more', *Maritime Workers' Journal*, vol.2 no.9, pp.9–11.

Martin, M. 1991, *The Analysis and Design of Business Information Systems*, Maxwell Macmillan, Sacramento, California.

Menon, J. 1993, *Import Price and Activity Elasticities for the Monash model: Johansen FIML Estimation of Cointegration Vectors*, Preliminary Working Paper No IP 58, Centre of Policy Studies and the Impact Project, Monash University, Melbourne.

Mulhall, B. 1994, 'The changing role of training in waterfront reform', paper presented to Ports, Waterfront and Shipping Conference, AIC Conference, Sydney NSW, pp. 21.

Newcastle Herald 1994, 'P&O results', *Newcastle Herald*, 26 March, p.11.

NYK 1993, submission to the Part X Review, no.14, NYK, Canberra.

Part X Review Panel 1993, *Liner Shipping Cargoes and Conferences — Review of Part X of the Trade Practices Act*, AGPS, Canberra.

PSA 1990, *Inquiry into Proposed Port Congestion Surcharge for Cargo Handling at Sydney*, Report no. 28, April, PSA, Melbourne.

—— 1992a, *Inquiry into Land Based Charges in Australian Ports by Ocean Carriers and Conferences*, Report no.42, PSA, Melbourne.

—— 1992b, *Monitoring of Stevedoring Costs and Charges, No.1*, November, PSA, Melbourne.

—— 1993a, submission to the Part X Review, no.46, PSA, Canberra.

—— 1993b, *Monitoring of Stevedoring Costs and Charges, No.2*, August, PSA, Melbourne.

—— 1994a, *Monitoring of Stevedoring Costs and Charges, No.3*, March, PSA, Melbourne.

—— 1994b, *Monitoring of Terminal Handling Charges*, April, PSA, Melbourne.

—— 1994c, *Monitoring of Stevedoring Costs and Charges, No.4*, August, PSA, Melbourne.

Review of Part X 1993, *see* Part X Review Panel.

Salerian, J. 1993, *Performance Indicators — Financial and Non-Financial*, AIC Seminar, 16–17 August.

SCS 1993, submission to the Part X Review, no.8, SCS, Canberra.

Stoner, J., Collins, R. & Yetton, P. 1985, *Management in Australia*, Prentice-Hall of Australia, Sydney.

Terry, C., Jones, R. & Braddock, R. (eds) 1988, *Australian Microeconomic Policies*, 3rd edn, Prentice-Hall of Australia, Sydney.

TPC 1992, *PSA Inquiry into Land Based Charges in Australian Ports, Comments by the Trade Practices Commission*, 29.5.1992, TPC, Canberra.

Travers Morgan 1994, *A Study of International and Domestic Shipping Movements in the Great Barrier Reef and Torres Strait region*, B/3599, Travers Morgan and Meyrick and Associates, October.

Willis, R. 1989, *Reforming Shipping and the Waterfront*, AGPS, Canberra.

WIRA 1989, *In-Principle Agreement — Stevedoring and International Container Depot Industries — September 1989*, AGPS, Canberra.

—— 1990, *Performance Indicators, December 1990*, WIRA, Canberra.

—— 1992a, *The Waterfront*, WIRA, Canberra, September.

—— 1992b, *Waterfront Industry Reform Authority Final Report October 1992*, WIRA, North Sydney.

—— 1992c, *Performance Indicators, September 1992*, WIRA, Canberra.

WISG 1993, submission to the Part X Review, no.34, WISG, Canberra.

WWF 1992, *Award Book: The Stevedoring Industry Award 1991*, WWF, Sydney.

## ABBREVIATIONS

| | |
|---|---|
| **AAPMA** | Association of Australian Ports and Marine Authorities |
| **ABB** | Australian Barley Board |
| **ABS** | Australian Bureau of Statistics |
| **ACTU** | Australian Council of Trade Unions |
| **AEWL** | Association of Employers of Waterside Labour |
| **AGPS** | Australian Government Publishing Service |
| **AIC** | Australian Investment Conferences |
| **AICC** | Australian Industrial Commodity Classification |
| **AMOU** | Australian Marine Officers' Union |
| **ANL** | Australian National Line |
| **ANTA** | Australian National Training Authority |
| **ANZDL** | Australia New Zealand Direct Line |
| **APCA** | Australian Port Charges Additional |
| **APSA** | Australian Peak Shippers' Association |
| **AS** | Australian Stevedores |
| **ASIA** | Australian Stevedoring Industry Authority |
| **ASIB** | Australian Stevedoring Industry Board |
| **ASO6** | Administrative Service Officer Class 6 |
| **ASO4** | Administrative Service Officer Class 4 |
| **ASUG** | Australian Shipping Users' Group |
| **ATAC** | Australian Transport Advisory Council |
| **ATC** | Australian Transport Council |
| **ATFCC** | Australian Transport Freight Commodity Classification |
| **AUSCLA** | Australia United States Container Line Association |
| **AWB** | Australian Wheat Board |

| | |
|---|---|
| **AWU** | Australian Workers' Union |
| **BHPS** | BHP Stevedoring (formerly Port Waratah Stevedoring) |
| **BIE** | Bureau of Industry Economics |
| **BTCE** | Bureau of Transport and Communications Economics |
| **BTE** | Bureau of Transport Economics |
| **CBH** | Co-operative Bulk Handling [Western Australia] |
| **cif** | cost, insurance and freight |
| **cpi** | consumer price index |
| **CRA** | Conzinc Rio Tinto of Australia |
| **CTAL** | Container Terminals of Australia Ltd |
| **CTPA** | Centre for Transport Policy Analysis |
| **DCN** | Daily Commercial News |
| **DEET** | Department of Employment, Education and Training |
| **dwt** | Deadweight tonnes |
| **EA** | Enterprise agreement |
| **ESCAP** | Economic and Social Commission for Asia and the Pacific |
| **ETU** | Electrical Trades Union |
| **FCL** | Full container load |
| **FESCO** | Far East Shipping Company |
| **feu** | Forty-foot equivalent unit |
| **fob** | free on board |
| **FPA** | Fremantle Port Authority |
| **IPA** | In-Principle Agreement |
| **IPLF** | Integrated port labour force |
| **IRC** | Industrial Relations Commission |
| **ISC** | Inter-State Commission |
| **LCL** | Less than container load |
| **LCS** | Liberty Cargo Systems |
| **LSS** | Liner Shipping Services Ltd |
| **MAMSAAL** | Metals and Minerals Shippers' Association of Australia Ltd |
| **MUA** | Maritime Union of Australia |
| **NSAVC** | National Stevedoring Australian Vocational Certificate |

| | |
|---|---|
| **NSIC** | National Stevedoring Industry Conference |
| **NTAC** | National Training Advisory Council |
| **NTAL** | National Terminals of Australia Ltd |
| **NTB** | National Training Board |
| **NYK** | Nippon Yusen Kaisha |
| **PMA** | Port of Melbourne Authority |
| **PPA** | Port pricing additional |
| **PSA** | Prices Surveillance Authority |
| **SACBH** | South Australian Co-operative Bulk Handling |
| **SCS** | Shipping Conference Services Ltd |
| **SIA** | Stevedoring Industry Award |
| **SIC** | Stevedoring Industry Commission |
| **SOB** | Senior Officer Class B |
| **SPOC** | Senior Professional Officer Class C |
| **SPU** | Storemen and Packers' Union |
| **teu** | Twenty-foot equivalent unit |
| **THC** | Terminal handling charge |
| **TPC** | Trade Practices Commission |
| **tph** | Tonnes per hour |
| **TWU** | Transport Workers' Union |
| **VRTA** | Victorian Road Transport Association |
| **WA DoT** | Western Australian Department of Transport |
| **WIRA** | Waterfront Industry Reform Authority |
| **WISG** | Wool Industry Shipping Group |
| **WWA** | Waterside Workers' Award |
| **WWF** | Waterside Workers' Federation |