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Productivity of Australian
Container Terminals:
Some Critical Issues

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ABSTRACT:

This paper is a modified version of a Report *Stevedoring Productivity at Australian Container Terminals: a Review* which was prepared for the Western Australian Department of Transport and which was completed in April 1996.

The Department was concerned at the continuing low levels of stevedoring productivity at Australian container terminals generally - despite an intensive waterfront reform program - and at terminals in the Port of Fremantle more particularly.

The conventional wisdom was that low productivity was a function of a number of factors - inadequate infrastructure, poor equipment, bad work practices, poor labour relations; but in our view the central issue was, and remains, the inadequacy of the policy framework erected on Enterprise Based Agreements (EBAs) and set in place under the WIRA arrangements by the end of 1991.

The initial Report focused on this issue with specific reference to the EBA framework adopted by P&O Ports; and to the new Productivity Employment Proposal or PEP scheme mooted by the company. Specific reference was also made to the Port of Fremantle where both major stevedoring companies - P&O Ports and Patrick - were operating under EBAs.

In 1996 the industry is still some way off an appropriate framework and mechanisms for achieving higher stevedoring productivity - the PEP scheme is still under scrutiny; Patrick, despite a prolonged and often acrimonious debate with its Union counterpart, found it necessary to resort to arbitration to revise its EBA; and the proposed Australian Workplace Agreements of the new coalition Government will enter into law in 1997. Not surprisingly, our research is continuing!

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1: INTRODUCTION

There continues to be some obsession with the question of whether or not Australian ports are more or less competitive than each other or than their international counterparts; and benchmarking exercises, too often seriously flawed, are nonetheless seen to be essential in stimulating reform.¹

The focus on 'competitiveness' is, however, unfortunate;² and the question of whether this port or that port is more competitive or less competitive than another is diverting.

The critical issue is not 'competitiveness' but productivity; and the central task is to understand what it is that 'drives' productivity in individual ports. How well one port compares with another is not without interest; but comparison is a relatively blunt instrument of change, much less of reform. **Efficiency changes in individual ports are best determined by comparing the system with itself under a range of realistically defined scenarios. Change is almost invariably incremental and is most likely to be based on fine tuning and adjustments to operating rules and parameters of one sort or another rather than on radical restructuring.**

This paper focuses on one aspect of port productivity - stevedoring productivity at container terminals. Moreover, its particular interest is not in the levels of productivity at individual terminals in Australia per se but in the diagnosis of what it is that 'drives' productivity levels³; and what steps can be taken to increase them.

This interest has been sharpened by a decline in productivity levels at some but not all Australian terminals through 1994 and 1995 - though whether or not these declines are part of a longer term trend or reflect particular circumstances - including an exceptional level of politicisation of labour issues in 1995 - will become clearer in due course.⁴

In any case such productivity declines prompt the somewhat more general question of why it is that, in spite of an extensive reform program, stevedoring productivity remains at such low levels.

It is this question which the Western Australia Department of Transport posed in September 1995 and which this paper addresses.

1.1 Focusing The Issues

Conventional wisdom suggests that a range of factors may be responsible for low productivity levels; but endemic low productivity would seem to suggest structural problems of one form or another rather than short-term mismatches. Is low productivity a function of inadequate or insufficient infrastructure, for example? Or is it more likely to be some function of the way in which the available infrastructure resources are allocated?

Similarly, are manning levels too high - or too low? Excess labour resources will inflate costs per unit of output; but with waterfront reform, labour levels have been set

low for a rising market. How does the stevedoring firm cope, with variable demand with a small core of permanent employees? Does it meet excess demand for labour with short-term casual labour? Or does it recycle its permanent labour through extra shift work or overtime? Or with a mix of both? Again, is it the quantum of the labour input that is critical? Or is it the allocation mechanisms that are the problem?

If productivity is low and wage levels high then per unit production costs will be higher than appropriate. Is the issue to reduce wage levels? Or is it to fix wages in such a way as to achieve high productivity? Is the central problem not the level of the wage but the way in which the wage is set?

The charge that the lack of competition on the waterfront constrains productivity is well-worn. Duopolistic competition imposes severe limits and is often described as the worst market structure for the user. But the need for economies of scale in container handling operations leaves the market structure options in low volume scenarios very limited indeed.

But is the key issue the **number** of players in the market place? Or is it the rigidities locked into labour market contractual arrangements in the market place? Or is it the way in which individual firms organise labour inputs?

In the following sections we will focus more sharply on what we think are the central issues in understanding endemic low productivity in Australian container terminals.

1.2 Structure Of The Paper

In the following section we seek to identify the fundamental principles in the relationship between enterprise employment and competition and between enterprise employment and productivity; and in so doing highlight the crucial research focus - that of managing variable demand.

In Section 3 we look at the way stevedoring firms deal with the problem of variable demand; and identify underlying problems. Section 4 suggests alternate options and examines the characteristics of CTAL's Productivity Employment Proposal or PEP Scheme.

In Section 5 we focus on productivity issues at the Fremantle terminals; and Section 6 summarises the arguments and notes the conclusions reached.

2: ENTERPRISE EMPLOYMENT, ENTERPRISE AGREEMENTS AND PRODUCTIVITY: A CONCEPTUAL FRAMEWORK

In March 1989 the Inter-State Commission handed down its recommendations for waterfront reform in Australia. At '... the heart of ... (its) proposed waterfront industry plan' was '... the modification of employment arrangements in the stevedoring industry'.⁵ More particularly, the Commission proposed that '... the current industry-wide arrangements, including levies and labour pools, be progressively replaced by enterprise employment. This will enhance competition, bring more pressure to bear on managers to manage effectively and to control costs, and encourage employees to identify with the enterprise'.⁶ Enterprises were, in fact, to '... take responsibility for the employer obligations normally met by enterprises in other industries'⁷; and enterprise agreements between employers and unions were to be established. In Australian container terminals these agreements, nurtured and approved by the Waterfront Industry Reform Authority (WIRA) under the In-Principle Agreement (IPA), were set in place by the end of 1991.⁸

This background is by now a more-or-less familiar one; but our special concern in this context is the quite critical issue of what, in effect, is the relationship between enterprise employment and productivity? And what precisely are the mechanisms by which enterprise employment can, as the Commission suggested, 'enhance competition'?

In our view, to understand these issues will allow us to formulate appropriate strategies and policies for productivity growth - and enhanced competition.

2.1 How Well Do Firms Compete In An Industry?

How effectively do stevedoring firms compete in the container handling industry? What is it that makes some firms in the industry more competitive - or more efficient or more productive or more profitable - than others?

Porter argues that the way in which firms compete in an industry - or what competitive strategy they adopt - reflects two particularly important conditions -

- the **structure** of the industry in which the firm is competing - or its '... underlying economic and technical characteristics'; and
- how the firm **positions itself** within that industry - what particular advantage it might exploit (its competitive advantage) and what competitive scope it will adopt.⁹

We take up these two points in reverse order.

2.2 Enterprise Employment, Positioning and Productivity

The restructuring of employment arrangements on the Australian waterfront - from industry-wide labour arrangements to enterprise employment - was of particular significance because it impacted directly on the individual stevedoring firm's ability to **position itself** in the container handling market. For the first time the individual

operator had the possibility of controlling the firm's labour inputs - the number, structure, costs, the way in which labour was allocated to tasks and its adjustment to demand fluctuations. At least, hypothetically, that is what control implies; in fact, as we shall note, continuing rigidities in the labour market 'constrain' the degree of control and flexibility of the individual operator. In any case, control over labour inputs adds to the firm's ability to '... organise and perform discrete activities'¹⁰; and how well the individual firm organises its labour and capital inputs to generate outputs - or, more simply, the levels of productivity it achieves - will determine its ability to compete in the industry.

The ability to exert control over labour inputs is important in any industry; but it is particularly important in the stevedoring industry because it is an industry which is characterised by

- significant variability of demand as well as
- often high levels of uncertainty of demand.

The actual number of ships - as well as trucks and rail wagons - arriving at the terminal at any point in time - varies markedly as does the volume of cargo presenting itself either from the ship or landside modes. Moreover, despite the scheduled nature of liner services, actual arrival times are often characterised by wide fluctuations and, not unusually, random arrival patterns particularly for the ship 'population' using the terminal. Rail arrivals are more predictable but truck arrivals may be uncertain; and trade volumes may fluctuate between wide limits.

Figure 2.1 illustrates the point. The individual histograms, computed for an earlier study¹¹ of the CTAL terminal at Port Botany, indicate the variability over a 3-month period, on a daily basis, of

- the number of ships alongside the terminal;
- the number of import and export containers handled; and
- the number of containers received at and dispatched from the terminal by road and rail.

The most critical issue in determining productivity levels for stevedoring firms in container handling operations is how effectively the firm deals with, or manages, variability in demand - how effectively it allocates its labour and capital inputs.

If this is the case the research priority in this study is to determine precisely what mechanisms and procedures are available in order to manage variable demand; and whether or not they are appropriate; and if they are not whether there are better ways.

2.3 Stevedoring Firms and the Structure of the Industry

We have argued that enterprise employment has provided firms with the possibility of controlling labour inputs; that such control is critical given the high level of variability of demand that characterises the industry; that the productivity of the firm will depend on how well it manages this variability of demand; and that if the firm manages this well its high levels of productivity will serve to deliver it a competitive edge within the industry.

Industries differ, however, in the degree to which they are 'conducive' to growth and profitability - or in the levels of competition that they sustain.

Porter's views are again useful and he argues that the nature of competition within the industry framework will be a function of the relative strengths of what he calls 'the five competitive forces that determine industry competition' - the threat of new entrants, the bargaining power of suppliers and buyers, the threat of substitute products or services and the degree of rivalry among existing competitors. Briefly, the following summary is illuminating -

'The five competitive forces determine industry profitability because they shape the prices firms can charge, the costs they have to bear, and the investment required to compete in the industry. The threat of new entrants limits the overall profit potential in the industry, because new entrants bring new capacity and seek market share, pushing down margins. Powerful buyers or suppliers bargain away the profits for themselves. Fierce competitive rivalry erodes profits by requiring higher costs of competing (such as for advertising, sales expenses, or R&D) or by passing on profits to customers in the form of lower prices. The presence of close substitute products limits the price competitors can charge without inducing substitution and eroding industry volume'.¹²

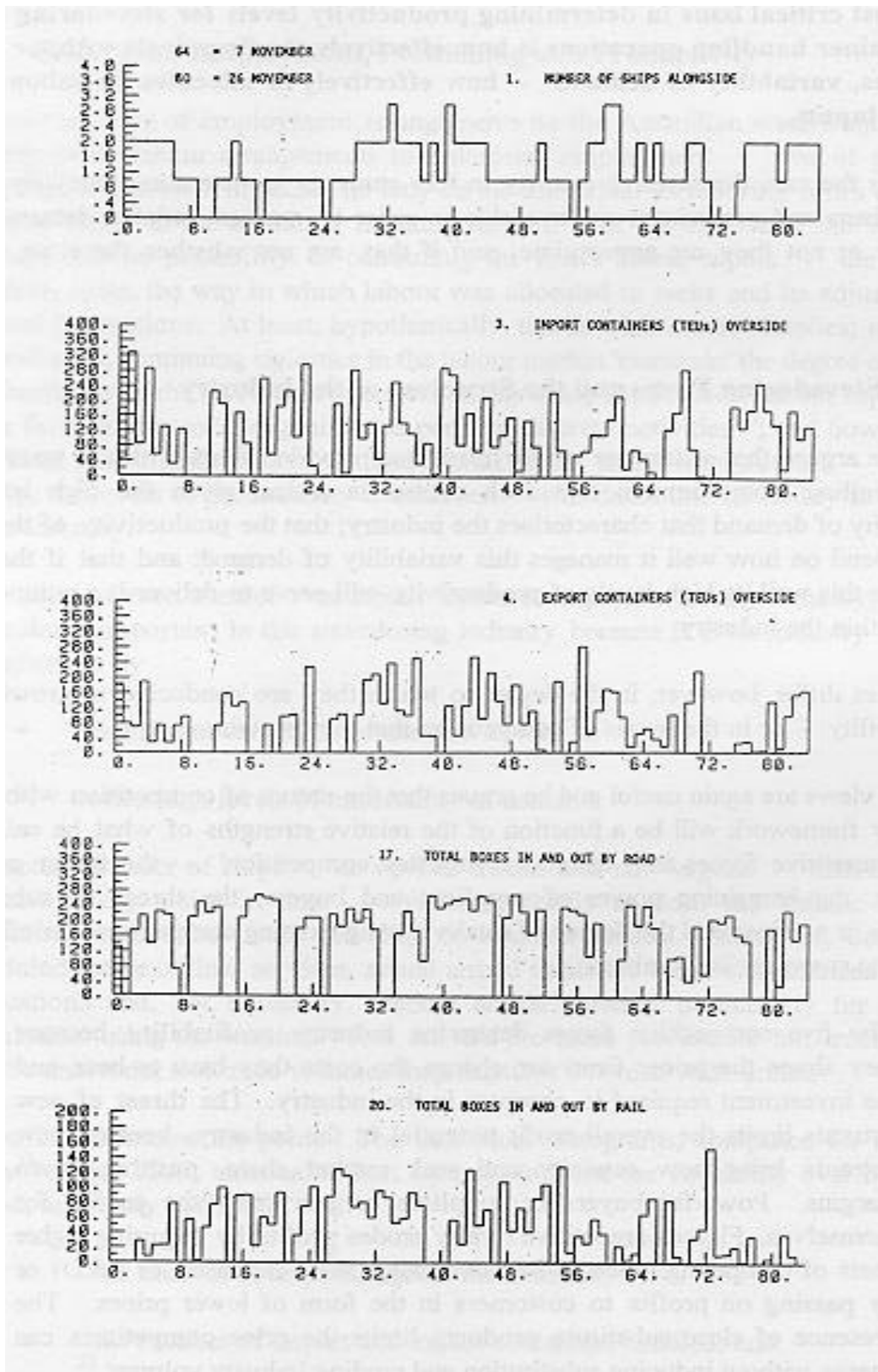


Figure 2.1: Variability in the number of ships alongside and in containers handled at the CTAL terminal over a 3 month period

Certainly, the stevedoring industry is not without its share of structural problems¹³; and the duopoly which has characterised the industry for some time is seen to be restrictive and less than ideal -

'... a duopoly is for users the worst of all market structures. There is the illusion of competition but not the substance. Price competition is eschewed because it will inevitably be met by retaliatory action. Non-price competition may be vigorous but tends to increase costs and economic rents rather than reduce them. Duopolists share a common interest in delivering economic rents to shareholders, managers and perhaps employees. Provided cost structure and market access are not markedly different, they are likely to split the market. Hence, there is neither the rationalisation that might flow from monopoly nor the efficiency and innovation that could be expected from a plurality of operators'.¹⁴

Nonetheless, note that there have been significant declines in box handling rates at the major terminals over the last decade - at CTAL, for example, from about \$265 per TEU to about \$200 per TEU in 1995.

Enterprise employment was seen by the Inter-State Commission as a strategy to overcome '... union monopolies over the supply of labour'¹⁵ - exemplifying, in Porter's terms, the strong bargaining power of suppliers; and the Waterfront Industry Reform authority in its Final Report in 1992 declared, as a 'Major Achievement', the creation of '... a fully competitive market structure'.¹⁶

But it is clear that the bargaining power of unions continues to impose rigidities within the labour market and detract from a 'fully competitive' market place. So-called 'pattern bargaining' - union bargaining to impose the same conditions on different firms - suggests constraints on the effectiveness of enterprise employment.

2.4 Summary

In structural terms, the container terminal market in Australian capital city ports is characterised for the most part by a duopoly. In smaller ports - if not in Sydney and Melbourne - this market structure almost certainly delivers higher per unit costs than might otherwise be the case with much larger throughputs. The charge that it is a 'cosy duopoly', as some suggest, is simplistic in the present context of tight market and trade conditions, cost sensitivities of shippers and the overseeing role of regulatory bodies - formerly, the Prices Surveillance Authority and the Trade Practices Commission, more recently merged as the Australian Competition and Consumer Commission.

The labour market, until the implementation of WIRA reforms characterised by strong monopoly control, has now some semblance of a more competitive structure with

enterprise employment; but a series of stoppages through 1995 demonstrated that significant rigidities still exist in the market place.

The research has shown, too, that rigidities exist at the level of the individual firm and impact on attempts by firms to position themselves in the market; **so that whilst EBAs have provided the framework for operational flexibility and control over labour inputs individual firms have continued to operate under significant constraints.**

In the following sections we explore these factors.

3: MANAGING VARIABLE DEMAND: THE STATUS QUO

The central problem of the stevedoring firm is that of meeting variable demand - how to allocate labour and capital (and other) resources in such a way as to optimise costs against often marked, short-run variations in demand for berth space, equipment, storage, interface transport operations, information and manpower. Such a problem is a quite different one from that for most manufacturing industries where, though demand fluctuations are not uncommon, supply responses are less immediate and more easily programmed.

How do stevedoring firms meet this variable demand? And how are Enterprise Agreements framed to meet this problem?

3.1 The Key Issues

There are three critical and interrelated factors which structure the way in which stevedoring firms are currently meeting variations in demand -

- the use of Overtime to meet 'above normal' demand;
- the employment, under current 'Order of Engagement' rules, of Permanent employees on Overtime loadings or 'penalty rates'; and
- a wage fixing mechanism that defines wages in terms, in effect, of 'time on the job' or 'time spent'.

We examine each of these in more detail.

3.1.1 Overtime as the key strategy : For stevedoring firms the negotiation of EBAs with labour unions and the ACTU within the reform framework provided by the Waterfront Industry Reform Authority provided a unique opportunity to 'downsize' the labour force and adjust labour supply to existing - or projected or at least most preferred - demand levels.

Almost certainly, however, labour levels remained somewhat higher than might have been the case in an unconstrained market; nonetheless, no better opportunity for labour-shedding had provided itself and firms drastically reduced labour requirements. They were also acutely aware of the fact that despite some loosening of the 'no redundancy' stand, assumed by the Unions over a long period of time, shedding labour under normal circumstances was, though not impossible, very difficult; and that, as a result, labour supply levels of permanent labour were 'inflexible'. Clearly, too, the high costs of maintaining a high-cost labour force under conditions of uncertain demand kept pressure on firms to minimise labour supply levels.

The upshot of these pressures has been that 'above normal' demands for labour on the terminals have been met by the assignment of overtime - largely, but not only, by Permanents in the terminal workforces (for reasons we shall note below).

The impacts of the 'overtime' strategy have been

- very high wages for a proportion of the Permanents - with wage levels above \$75,000 and in some cases above \$90,000 quoted in discussions;
- long hours on the job - with 60 hours per week not unusual; and with
- concerns expressed about safety; and with
- about one third of stevedoring firms' labour budgets attributable to overtime payments.

Clearly, there is an upper limit to the amount of overtime that can be worked by the Permanents in terminal workforces; and there is now concern in some if not most terminals that even with the relatively small increases in demand over the past year or so the present situation is increasingly unsustainable - in terms of both the workforce itself and increasing cost pressures from the 'overtime strategy'.

3.1.2 Order of engagement, permanents and 'penalty rates': The large proportion of overtime work required is a central factor in the high-cost equation; but it is not the only one.

Union policy has underlined the position that the Australian waterfront should be manned by a permanent, fully-trained and responsible workforce; and that most, if not all, work should be carried out by that group. The use of Supplementary labour, or Casuals, is therefore seen to be undesirable. (Less formally, there is also a strong view which sees Casuals - often former waterfront labourers made redundant - as 'double-dipping' and no longer requiring or deserving of employment). Clearly, too, the more extensive use of Supplementaries is seen by the existing Permanent labour force to be a factor in reducing overtime and the high overtime payments associated with it.

This general policy stand has translated itself into, and is reflected in, the 'Order of Engagement of Employees' that is an important element in the firms' EBAs or EAs - or, at least, has been to date. The following note quotes the relevant section from the 1994-1996 CTAL Enterprise Agreement -

"18.1 Order of Engagement of Employees

Subject to the skill requirements of CTAL and constraints imposed by the notification times in Clause 22 of this Agreement, CTAL requirements shall be met on a shift-by-shift basis in the following order:

Order of Engagement of Employees

Monday to Friday

1. Rostered permanent employees
2. AVC Trainees (subject to skills)
3. GWEs up to the limit of the guarantee
4. Surplus White Bay employees
5. Permanent employees on double-headers (limit of two non-consecutive per week in accordance with Clause 23.2.4)
6. Permanent employees on rostered days off (limit of one per week)
7. GWEs beyond guarantee
8. Supplementary employees
9. Other double headers in the above order

Saturday and Sunday

1. Rostered Permanent Employees
2. Permanent employees on overtime shifts
3. AVC employees on overtime shifts (subject to skills)
4. GWEs
5. Surplus White Bay employees
6. Permanent employees on double headers (limit of two non-consecutive per week in accordance with Clause 23.2.4)
7. Supplementary employees
8. Other double headers in the above order

In the event Conaust White Bay is unable to provide a list of transfer employees, the shifts and the duration for which they are available in sufficient time to allow CTAL to carry out its allocation, then the abovementioned sequence shall be followed without the need to engage transfer employees.

For the purpose of this clause "surplus White Bay employees" means employees who in their normal roster position at White Bay are

available but not required to work at White Bay and are suitably qualified to carry out the work at CTAL."

Source: *CTAL Enterprise Agreement, 1994-1996*, pp15-16.

Note that 'Supplementary employees' have very low priority of employment in both week-day and weekend work. More recently there has been some relaxation of these priorities; but for the most part the present above-normal demand condition is met by Permanents on Overtime or Penalty rates. **The alternate strategy would be, of course, to soak up demand with Supplementary labour on regular shifts without Overtime loadings.**

3.1.3 A wage structure problem? There is a third factor which is perhaps both a result or an outcome of, as well as a cause of, the present Overtime strategy and its associated problems - it is the way in which the wage is a function of time spent on the job. Note that under 'above normal' demand conditions wage structure as follows -

$$\text{WAGE} = \left[\begin{array}{c} \text{Shift} \\ \text{Rate} \end{array} \right] + \left[\begin{array}{c} \text{Overtime} \\ \text{Loading} \end{array} \right] + \left[\begin{array}{c} \text{Productivity} \\ \text{Loading} \end{array} \right]$$

In this structure we note, further, a number of characteristics

- the Overtime Loading is, in fact, the most important element in supplementing wages; and
- the Productivity Loading may or may not add to the wage level and in any case it is quantitatively much less attractive than an Overtime payment (see Appendix 1).

Given this structure, it is apparent that the inducement to spend time on the job is far more attractive than the inducement to be productive. **In effect, this structure rewards low productivity by extending the time it takes to perform tasks; and penalises, in dollar terms, high productivity.**

The way in which the wage is structured is, in itself, a powerful deterrent to high productivity - intuitively and arguably the precise opposite structure to that which is required in a service operation.

Even under the normal working conditions of a container terminal this wage structure will limit productivity. But note that such a structure also ensures high wage outcomes in post-stoppage or post-strike situations. Unless shipowners and cargo owners are indifferent to delays to ships and therefore cargoes - a most unlikely situation - the excess demand created by the stoppage and the urgency of clearing both ships and cargo effectively guarantee high wage outcomes through the creation of the need for high levels of Overtime; and under such

circumstances it is likely that the wage will be further supplemented by a Productivity Loading in the higher range!

3.2 Unsatisfactory Outcomes?

Clearly, the Enterprise Agreement frameworks within which container terminals are currently operating are quite inadequate and are, in fact, inducing and encouraging low productivity and high costs.

Is there a better way? Is it possible to link wages to productivity rather than time? We will explore these possibilities in Section 4; but in the following sections we note briefly some empirical evidence of current terminal operations under existing EBAs or EAs.

3.3 Some Empirical Evidence

The data in the following tables have been abstracted from detailed records of CTAL terminal operations over a 24-day period within the period January to March 1995. The period was seen to be representative of the operations of the terminal and was used as the basis of a detailed simulation for defining optimal operating conditions under a range of productivity scenarios (see Appendix 2).

In this context, the following tables indicate some of the characteristics of present operating conditions -

- **Table 3.1** - is an overview table. The general impression is one of considerable variability in the number of vessels, the number of containers handled, the number of cranes used and the number of containers handled per crane hour. This last indicator suggests that only in 1 in 4 shifts did the containers handled per crane hour exceed 15 and only in 2 shifts of 72 did rates equal 20 or more. In numerous shifts, relatively small numbers of boxes are handled by what appears to be crane over-capacity to give low

numbers of containers per crane hour - 4 cranes for 4 ships for 178 boxes at a rate of 6.4 containers per crane hour (Day 1, Evening Shift); or 3 cranes for 2 ships for 117 boxes at a rate of 5.6 containers per crane hour (Day 22, Evening Shift);

- **Table 3.2** - groups some of the data used in the previous table to indicate the range of container handling rates by the number of ships and cranes involved. The results are mixed - for example
 - 3 ships alongside using 2 cranes achieved rates of between 8.6 and 18.1 boxes
 - 3 ships alongside using 3 cranes achieved rates of between 7.1 and 15.9 boxes, and
 - 3 ships using 4 cranes achieved rates of between 10 and 16.9 boxes per crane hour.

- **Table 3.3** - the average number of containers handled per shift is notably larger than that for Day and Evening Shifts - which are similar, though the Evening Shift shows greater variability about the average.

- **Table 3.4** - the average handling rate is also higher on the Midnight Shift than on the other two shifts; and again there is greater variability about the average of Evening Shift rates.

Table 3.2 : Containers handled per crane hour by number of ships alongside and number of cranes used

Number of ships alongside on any one shift	Number of cranes used				Number of ships using n cranes
	1	2	3	4	
Minimum/maximum values for containers handled per crane hour					
1	-	6.2 17.7	9.4	-	11
2	-	12.6 22.1	5.6	15.6	23
3	-	8.6 and 18.1	7.1 15.9	10.0 16.9	28
4	-	9.4	12.1	6.4	7

Number of shifts in which n cranes were used	0	15	40	13	

Source: Table 3.1

Table 3.1 : Containers* handled per crane hour

Productivity of Australian Container Terminals: Some Critical Issues
Robinson & Everett

Table 3.1 : Containers* handled per crane hour

		Number of vessels	Containers exchanged	Number of cranes	Containers/ crane hour **
1	M	2	341	3	16.2
	D	4	254	3	12.1
	E	4	178	4	6.4
2	M	4	312	4	11.1
	D	2	255	3	12.1
	E	2	238	3	11.3
3	M	2	355	3	16.9
	D	3	206	3	9.8
	E	2	326	3	15.5
4	M	2	255	3	12.1
	D	1	174	2	12.4
	E	0	0	0	0
5	M	0	0	0	0
	D	0	0	0	0
	E	1	184	2	13.1
6	M	1	248	2	17.7
	D	2	176	2	12.6
	E	2	349	3	16.6
7	M	2	419	3	20.0
	D	3	246	3	11.7
	E	2	338	3	16.1
8	M	3	472	4	16.9
	D	2	340	3	16.2
	E	2	312	3	14.9
9	M	4	275	4	9.8
	D	3	287	3	13.7
	E	3	274	3	13.1
10	M	3	454	4	16.2
	D	3	175	3	5.5
	E	2	242	2	17.3
11	M	3	276	3	9.9
	D	3	210	3	10.0
	E	3	297	3	9.9
12	M	2	246	3	11.7
	D	1	198	3	9.4
	E	2	208	3	9.9
13	M	3	220	3	10.5
	D	3	242	3	11.5
	E	1	176	2	12.6
14	M	2	436	4	15.6
	D	2	199	3	9.5
	E	3	246	3	11.7
15	M	3	334	3	15.9
	D	3	279	4	10.0
	E	4	131	2	9.4
16	M	3	427	4	15.3
	D	3	272	3	13.0
	E	3	261	3	12.4
17	M	3	323	4	11.5
	D	3	202	3	9.6
	E	4	282	3	13.4
18	M	4	340	4	12.1
	D	2	309	2	22.1
	E	3	120	2	8.6
19	M	3	252	4	8.3
	D	2	238	3	11.3
	E	3	253	2	18.1
20	M	3	407	4	14.5
	D	3	301	3	14.3
	E	3	290	3	13.8
21	M	3	435	4	15.3
	D	2	251	3	12.0
	E	2	258	3	12.3
22	M	2	283	3	13.5
	D	1	182	2	13.0
	E	2	117	3	5.6
23	M	1	212	2	15.1
	D	1	87	2	6.2
	E	1	130	2	9.3
24	M	1	160	2	11.4
	D	1	0	0	0
	E	3	150	3	7.1

* Note the unit of measurement is containers, not TEUs
** Crane assumed to operate for 7 hours in each shift
Shaded areas are Saturdays and Sundays
*** M = Midnight Shift (2200-0530 hours)
D = Day Shift (0700-1430 hours)
E = Evening Shift (1430-2200 hours)

Table 3.3 : Containers handled per shift

DAY	SHIFT		
	M	D	E
1	341	254	178
2	312	255	238
3	355	206	326
4	255	174	0
5	0	0	184
6	248	176	349
7	419	246	338
8	472	340	312
9	275	287	274
10	454	175	242
11	208	210	207
12	246	198	208
13	220	242	176
14	436	199	246
15	334	279	131
16	427	272	261
17	323	202	282
18	340	309	120
19	232	238	253
20	407	301	290
21	435	251	258
22	283	182	117
23	212	87	130
24	160	0	150
Average	322	231	229
Standard Deviation	90	56	70

Source: Table 3.1

3.4 Summary

We have suggested in this chapter that the central problem for a stevedoring firm is that of meeting variable demand in a cost-effective way; and we have argued further that the way in which firms - and particularly CTAL - allocate labour and equipment to meet variable demand within the framework of the current EBA or EA raises serious issues. Indeed, it is likely that even with modest increases in demand for terminal services the EBA framework may become increasingly unsustainable - though we have not been in a position to evaluate cost structures.

Empirical evidence confirms less than optimal operations.

Is there a better way? We turn to this question in the following section.

Table 3.4 : Crane handling rates by shift (containers per hour)

DAY	SHIFT		
	M	D	E
1	16.2	12.1	6.4
2	11.1	12.1	11.3
3	16.9	9.8	15.5
4	12.1	12.4	0
5	0	0	13.1
6	17.7	12.6	16.6
7	20.0	11.7	16.1
8	16.9	16.2	14.9
9	9.8	13.7	13.1
10	16.2	8.3	17.3
11	9.9	10.0	9.9
12	11.7	9.4	9.9
13	10.5	11.5	12.6
14	15.6	9.5	11.7
15	15.9	10.0	9.4
16	15.3	13.0	12.4
17	11.5	9.6	13.4
18	12.1	22.1	8.6
19	8.3	11.3	18.1
20	14.5	14.3	13.8
21	15.5	12.0	12.3
22	13.5	13.0	5.6
23	15.1	6.2	9.3
24	11.4	0	7.1
Average	13.8	12.9	12.1
Standard Deviation	2.95	3.2	3.4

Source: Table 3.1

4: MANAGING VARIABLE DEMAND: ALTERNATIVE FRAMEWORKS

4.1 The Crucial Issues

Why is productivity low in container terminals? Certainly the 'culture' of the waterfront remains a powerful inhibitor ; and a number of other factors which we noted earlier are not unimportant. But the overriding, critical factor is that **high productivity** in current wage structuring is significantly less valued than **time**. Wage outcomes are, in effect, a function of time on the job (and the penalty rates that are attracted to 'excessive' time or overtime) rather than on how productively that time is used. The situation is that

- a small number of Permanent employees
- working at low levels of productivity induced by a wage system rewarding time on the job not productivity; and
- unwilling to substitute Supplementary or casual labour at standard shift rates and/or penalty rates except under quite specific conditions effectively locks the work task into high levels of overtime; and into low productivity.

In current wage determinations

$$\text{Wage} = \text{the Shift Loading} + \text{an Overtime Loading and/or} \\ \text{a Productivity Bonus}$$

The key problem converges on how to handle overtime? Can it be eliminated or minimised in a cost-effective way?

4.2 The Options?

4.2.1 Adding labour: Clearly, and assuming static productivity levels, it would be possible to

- add more Permanents to the workforce;
- add more Supplementaries; or
- add a cost-effective mix of both Permanent and Supplementary labour.

Adding labour will add to fixed costs of the firm; but, given the difficulty under present conditions which firms have in shedding Permanent labour, corporate policy has been to minimise labour inputs. Adding Supplementary labour or casuals is attractive to the firm; but not to the Union which opposes the 'casualisation' of the waterfront and which sees wages erosion with increases in employee numbers.

4.2.2 Enhancing productivity: Achieving higher levels of productivity will reduce and possibly eliminate overtime. Clearly, there would be some trade off between productivity, labour resources, other resources and levels of technology, and costs.

In this scenario, the issue is how to enhance productivity? The simple answer is to pay for it - to value productivity more highly than time spent on the job; to make wages a function of productivity. Under present circumstances, in which

$$\text{Wage} = \text{Shift Loading} + \text{Overtime Loading and/or} \\ \text{a Productivity Bonus}$$

there would need to be an adjustment of the **numbers employed** and the **productivity bonus** to ensure the elimination or near-elimination of overtime loadings. In effect, this would mean a significant increase in the **levels of productivity bonus** and may also require **increases to the standard shift Loading**.

4.2.3 Adjusting to changes in demand: There will of course, be upper limits to productivity and in conditions of rising demand an increase in labour input will be required beyond some quantifiable threshold.

Under conditions of falling demand, however, the firm may need to shed labour - or, in one way or another, reduce labour costs. Falling wage levels will disadvantage employees; so that wage instability for employees and excess labour from the firm's point of view will create difficulties. For the firm, some flexibility is possible if the use of Supplementaries can be varied.

But the question of adjustment to falling demand underlines two extremely important issues -

- the desirability of wage stability, as well as high productivity performance, for employees; and
- the need for the firm to be able to adjust its labour costs under conditions of falling demand.

Neither of these problems is dealt with effectively under present EBA arrangements.

4.3 CTAL's Productivity Employment Proposal: the PEP Scheme¹⁷

In 1995 P&O Ports developed its so-called PEP Scheme, essentially for its operations at the Port Botany CTAL terminal though the basis of the scheme is thought to have potential for application in other terminals.

In effect, the scheme has recognised that the central issue for stevedoring productivity is overtime - and that '... overtime earnings (have driven) the cycle of inefficiency and excessive hours on the job'. Poor productivity - low container handling rates, high berth occupancy, vessel queuing, long waiting times for trucks - on the one hand and high costs on the other were seen to be unsustainable in the medium and longer term. As stated, then

'... the aim of the project is to enable the workforce to earn relatively the same income as they presently do, whilst providing the incentive to perform in the most efficient (time, cost and safe) manner. The scheme rewards productivity and precludes workers earning a large percentage of their income from overtime'.

Effectively, the scheme substitutes **productivity increases** for **overtime**.

4.3.1 Determining resource needs: The scheme is based on a rigorous analysis of the actual operating conditions of the terminal over a 3-month period January to March 1995; and a simulation of a 24-day period within these months under a range of assumptions to determine more effective patterns of response allocation, including labour requirements and assignment.

In effect, the simulation problem was to determine what labour and equipment requirements - both in number and operational terms - were 'necessary to perform at an industry-acceptable rate of 24 containers per crane hour'?

A number of assumptions were made, including the following

- terminal operations were over a 24-hour day;
- crane rates were based on working 7 hours of an 8 hour shift;
- ship arrival times were the same as actual times over the period;
- different ship servicing rates - 24 containers/crane hour assumed for fast-working ships; 13 containers/crane hour for slow-working ships (or 168 lifts and 91 lifts/hour per shift respectively);
- ships were capable of working all cranes assigned; and
- could be worked for the whole of a shift;

- equipment was available and operational as required; and
- labour was determined on an as-needs basis.

Table 4.1 indicates the significant differences in labour requirements under assumptions of higher productivity - over the 24-day period the **average** manshift requirement under the present, actual allocation was twice that of a 'high productivity' alternative; and showed less variation about the Mean or Average value - or in effect much less flexibility.

Simulation results also showed more effective use of cranes and equipment.

4.3.2 An effective roster to deliver efficient resource allocation : Final labour requirements were calculated from the model and further analysis was required to define an appropriate roster. The outcome was

- a 16-week roster cycle;
- a 26-hour shift coverage (two eight hour shifts and one 10 hour shift);
- a 35-hour per week balanced roster;
- 45 days off in 16 weeks;
- 2 rostered weeks off in 16 weeks;
- 10 full weekends off in 16 weeks.

These characteristics are shown in Table 4.2.

4.3.3 The wage outcome: In an attempt to preserve wage levels similar to those currently achieved, to provide some wage stability, to reward productivity and to eliminate (or minimise) overtime payment the wage structure has been determined as

$$\text{Wage} = \text{An Average Weekly Rate} + \text{Productivity Loading}$$

The **Average Weekly Rate** (AWR) has been determined at about the average rank or Grade Level of the workforce at the terminal as in 1995 - initially, at least, an annualised salary level of about \$48,000. This AWR will vary depending on the **skill level** of the employee - now ranked into four skill levels with, for example, a Quay Crane Driver classified at the highest skill level.

Table 4.1 : Labour (manshifts) required under actual and 'optimal' conditions

Day	Actual Manshifts Used	Manshifts Required Under 'Optimal' Conditions	
1	269	161	
2	266	163	
3	155	63	
4	92	3	
5	209	98	
6	267	145	
7	242	153	
8	264	155	
9	280	194	
10	286	131	
11	264	86	
12	228	118	
13	238	133	
14	256	144	
15	258	175	
16	282	123	
17	329	126	
18	308	59	
19	250	145	
20	260	189	
21	256	107	
22	230	109	
23	226	108	
24	226	78	
Average	Standard	248	124
	Deviation	48	44

* Shaded areas represent weekends

Table 4.2: The characteristics of the roster

WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M	E	I	D	X	D/E	I	D	X	E	I	X	E	X	I	D/E	X
T	E	I	X	D	D/E	I	X	X	E	I	D	E	D/E	I	X	X
W	E	I	X	D	D/E	I	X	X	E	I	D	E	D/E	I	X	X
T	E	X	I	D	D/E	X	I	X	E	I	D	E	D/E	X	I	X
F	E	X	I	D	D/E	X	I	X	E	I	D	E	D/E	X	I	X
SAT	X	D/E	I	X	X	D/E	I	X	X	X	X	X	X	D/E	I	X
SUN	X	D/E	I	X	X	D/E	I	X	X	X	X	X	X	D/E	I	X

- * D/E = AN 8 HOUR DAY OR EVENING SHIFT
- * E = AN 8 HOUR EVENING SHIFT
- * I = AN 8 HOUR TOTALLY IRREGULAR SHIFT
- * D = A VARIABLE START LONG SHIFT
- * X = DAYS OFF

The **Productivity loading** will be paid from the balance of the total annual budget for labour less the fixed wages bill - a pool equivalent, in effect, to the expected earnings in overtime payments.

The pool will be split to reward productivity

- in the receipt/delivery operations; and
- in the container crane handling operations.

Productivity loadings will be paid

- for crane rates (containers per hour) between 15 and 30, with a maximum loading **from the pool** payable for a crane handling rate of 24 containers per hour. For higher crane handling rates (from 25 to 30 containers per hour) a 'super bonus' will be paid - funded by reduction in penalties levied by shipping lines for poor performance. For slow working vessels a crane handling rate of 15 containers per hour will attract the maximum loading from the pool;
- for truck handling times (THT), a bonus will be paid for times between 30 minutes and 15 minutes, with maximum loading from the pool available for handling trucks in 20 minutes.

4.3.4 Complementary changes: In an attempt to support higher productivity other changes are planned or have been implemented, including

- the redesign of yard layout and traffic flows;
- installation of a new, computerised planning and operating programme;
- the introduction of Rubber-Tyred Gantry cranes (RTGs) to handle containers in the yard; and
- the installation of two additional quay cranes to handle ship/shore operations.

4.3.5 The downside of the scheme: There are a number of difficulties with the PEP Scheme and we note the following -

- **It is a high cost strategy.** The scheme is designed to maintain wage levels (or earnings) at about current levels - which may average over \$75,000 per year with some employees earning over \$90,000. It is, of course,

possible to set a lower Average Weekly Rate and raise the productivity levels at which significant bonus payments are available in order to reduce earning outcomes. Note, too, that in the implementation of the Scheme Overtime and Overtime Payments must be eliminated if it is to be successful.

- **Total labour cost levels would remain at current levels.** There may be some difficulties in keeping labour budget levels static - or relatively static; though clearly there is considerable benefit beyond the short term in a relatively constant labour budget level.

Note that if labour costs remain more-or-less constant there would be, nonetheless, spinoffs in

- reduced ship turnaround time with increased productivity;
- reduced cargo time in port; and
- reduced truck turnaround times and shorter waiting times.

These benefits may or may not attract some pricing premium at the terminal (and/or elsewhere); but there are potential benefits for shippers, shipowners and trucking firms. For the terminal operator, higher productivity would mean more effective use of berth space, equipment and storage space and could be expected to result in delayed investment in plant and equipment.

- **The problem of a fall-off in trade.** Under a PEP Scheme the Average Weekly Rate and the Productivity bonus could be unaffected whether trade increases or decreases (for whatever reason). Under these conditions the firm would find revenue falling but costs remaining constant - with options to increase prices or decrease labour costs. In this scenario, the ability of the firm to shed labour becomes critical; and whilst it may be able to reduce the input of Supplementary or casual labour its ability to reduce Permanent labour could be difficult under present circumstances.
- **Other problems.** There may be a range of problems associated with the **details** of the scheme rather than with its broad structure. Certainly it is possible under the scheme to **adjust** the levels at which the productivity bonus is paid, as noted earlier - so that, for example, crane handling rates of 20 containers per hour may be seen as a realistic minimum base for productivity payments, rather than 15 or 18 containers per hour.

We are not aware of some of the more detailed definitions in the scheme; but it appears likely that truck handling times, for example, could be manipulated by holding trucks **out of the yard** until they can be handled

at the rate of 20 minutes, which attracts maximum bonus. (The truck handling time refers to the time elapsed between the truck entering and leaving the yard. The shipper is, of course, interested in minimising the **total time** which a truck spends at the terminal - not simply the time spent in the yard!).

4.3.6 The upside of the scheme: There are a number of positive points that should be made about the scheme -

- it is an innovative attempt to address the critical problem of overtime and overtime loadings in terminal productivity;
- it has attempted to address the issue of wage structuring and to relate wage reward to productivity not time;
- the scheme is built upon a rigorous analysis of the actual operations of a terminal, the nature of demand, resource availability, corporate and labour policies, wage and productivity expectations; it has, in fact, attempted to define possibilities rather than cope with constraints;
- it has determined alternative ways to overcome some of the labour market rigidities which have persisted in the EBA environment - including, for example, the Order of Engagement and the length of shifts.

Not all terminals would be able to adopt the PEP scheme as it is currently defined; but the **process** by which the scheme has been developed and the **issues** which it addresses serves as a useful framework for trying to solve the productivity problem. **Each terminal and port is different and will have different cost profiles; and there ought to be no expectation of portability - at least in detail and final form; but each terminal needs to assess the way in which it determines its productivity outcomes. In a competitive terminals market wage levels (including the Average Weekly Rate and the Productivity Bonus) must reflect the costs/revenue equation of the particular terminal - not a uniquely defined and uniformly imposed wage level.**

4.4 Summary

We have argued in this section that the key problem which stevedoring firms have in meeting variable demand is the way in which they are dealing with Overtime and Overtime loadings. Current wage determination locks in low productivity by valuing time spent on the job more highly than productivity.

The addition of more labour resources will raise fixed costs, dilute employee pay levels and will not address the issue of wage as a function of time on the job.

Achieving higher levels of productivity could reduce or eliminate Overtime - so the problem becomes that of how to enhance productivity. The answer is, in effect, to value productivity more highly than time on the job; so that restructuring the wage fixing mechanism becomes a key strategy.

The CTAL Productivity Employment Proposal offers a way ahead and it has been discussed in some detail, with an added note about its strengths and weaknesses.

5: THE FREMANTLE TERMINALS: SIMILAR PROBLEMS OR A SPECIAL CASE?

5.1 Wider Influences?

A regional location that is about as far removed from the commercial and demographic heartland of the nation as is possible does not confer immunity from those factors which determine waterfront productivity levels in east coast and other national ports. In fact, the terminals in the Port of Fremantle are effectively integrated into national shipping networks and into port operations in a number of ways including the following:

- **Corporate linkages** tie the two terminal operators into policies and practices that are determined at the national head offices in the eastern states; so, despite the ability to act independently in a range of matters, clearly what happens in Sydney and Melbourne and elsewhere will have important implications for what happens in Fremantle;
- **Operational linkages** - first port of call eastbound and last port of call westbound - are also important; and corporate efforts to capture market share by handling the same ships in different ports further strengthen patterns of integration;
- **Labour market structures** - union structures, policies and practices - also serve to restrict independence and impose conformity of action and practice.

Nonetheless, despite this pervasive 'national determinism' what happens locally or regionally is not unimportant.

5.2 The Regional Context

The port community in Fremantle is somewhat smaller than that in Sydney or Melbourne; and it tends to be well established and cohesive. Not surprisingly then, the high degree of politicisation of labour disputes on the waterfront (or with

implications for waterfront labour and operations) that occurred during 1995 had quite serious implications for the terminals' workforce. In particular, the attempt to introduce new stevedoring operations into the port, the protracted Stateships problems and the CRA-related labour issues served to alienate the workforce and Government - and by association, the workforce and management.

For much of 1995 then - if not for somewhat longer - terminals operation and productivity were severely impacted by events quite outside the direct control of terminal managements. Certainly, already difficult and protracted negotiations for new Enterprise Agreements were made even more difficult.

Quite apart from these contextual problems the Fremantle terminals do have a number of specific conditions that are important in determining productivity levels.

- **Problems associated with infrastructure and equipment:** Both terminals have operated for some considerable time with their individual operations carried on across unconsolidated terminals. Under these conditions it is hardly surprising that it has been difficult to achieve operating economies and economies of scale.

Note also that the terminals have been operating with gantry cranes that date back in some cases to the establishment of the Seatainer terminal, for example, and served the original vessels in the Australia-Europe container trade. Other handling equipment has been 'imported' from other ports and refitted - with less than satisfactory results, as in the case of rubber-tyred gantries on the P&O Ports berth and ex Port Botany equipment at the Patricks terminal. (Severe damage to the gantry crane on the P&O Ports terminal in 1994 after a ship-related accident also impacted directly on productivity - though this was hardly a predictable event!).

The decisions to consolidate terminal space, and the further decision to invest very large sums in new equipment by both operators, might be seen to mark the beginning of a new phase in container handling in the port. At least, the constraints on productivity imposed by inefficient equipment will be alleviated.

- **Problems associated with the regional trade mix and ship-handling:** Both terminal operators have pointed to the difficulty of negotiating Enterprise Agreements with a workforce that has traditionally worked in both general cargo handling and in container handling operations, sometimes over the same or adjacent berth areas. Bulk handling and general cargo handling operations have been characterised by a very high variability in demand - which may require a relatively small core workforce with the ability to add Supplementary labour as required. Container handling, on the other hand, has tended to require a larger core workforce and a relatively smaller number of Supplementaries. Issues relating to the ability to interchange labour, the measurement of performance, inequality in the conditions of work and in rewards have therefore posed problems not common in terminal-only workforces. We have not pursued these issues; or the extent to which Enterprise Agreements should be separately negotiated with 'separate' groups for conventional cargo or container operations or whether or not one Agreement may be appropriate.
- **Problems associated with ship presentation:** Terminal operators pointed not only to the productivity impacts of split-terminal operations and inefficient equipment but also to the problems associated with poor ship presentation. In some cases this referred to poor stowage and difficult hold configurations; and in others it related to the problems of restowing and sorting of containers either prior to or after other port calls in Australia and

Fremantle's status as a first port of call on entry/last port of call on exit. Certainly, lower productivity on these vessels will reduce overall port averages; and if prices have been set appropriately they will pay some penalty for poor working.

5.3 Productivity Levels

What handling rates are being achieved at Fremantle's container terminals?

Table 5.1 provides some indication over 1994 and 1995 for one of the port's terminals (P&O Ports). The **monthly average** container (TEU) moves per hour was 20.72 in 1994 and 20.92 in 1995.

Table 5.1: Selected productivity characteristics, P&O Ports Terminal, Port of Fremantle 1994 and 1995

Month	1994			1995				
	TEUs	Vessel Calls	Gross TEUs p.h.	TEUs	Containers	Vessel l Calls	Gross TEUs p.h.	Container Moves p.h.
January	7653	28	21.38	11041	8988	34	23.28	18.95
February	7234	23	20.64	9312	7769	30	20.18	16.84
March	9328	32	19.54	11901	9928	31	21.49	17.93
April	9818	34	19.81	10121	8575	32	22.30	18.89
May	9352	31	19.34	10970	8986	30	20.53	16.81
June	9673	34	20.23	9341	7773	31	20.36	16.16
July	9146	30	20.74	10418	8474	34	20.45	18.21
August	9271	32	21.60	11073	9201	32	21.98	19.21
September	8155	25	19.63	11753	9774	38	20.79	17.77
October	11949	33	21.68	9833	8140	29	20.29	16.80
November	10603	29	21.74	10908	8751	29	19.67	15.78
December	10359	30	22.33	11787	9606	33	19.71	16.07
Total	112541	361		128458	105965	383		
Average		30	20.72			32	20.92	17.45
Ave TEUs per vessel call:		312				335		

These figures are not strictly comparable with those for the CTAL Terminal in Port Botany, noted in Table 3.1; but the month-by-month average value for container moves per hour suggests that the Fremantle rates are somewhat higher than those achieved at Port Botany.

For those vessels able to unload and load full loads of 500 to 600 containers in Fremantle crane rates per hour are as high as 32 TEUs and may be as high as 27 containers per crane hour. For other reasonably stowed vessels 145 container moves per shift or over 20 container moves per crane hour in a 7 hour shift is more usual. It is arguable that, given the problems of old equipment and split berth operations and the other problems noted above, these productivity outcomes are much better than we might have expected!

5.4 Conclusion: Unique Solutions?

Productivity levels are a function of the particular organisational and operating and other characteristics of the individual terminal or system; and meaningful comparisons are with the terminal or system itself operating under different assumptions or rules or practices. We should not be at all surprised that handling rates at the Fremantle terminals may differ from those in other ports - on any one day or over one month or over one year.

On the other hand, we have also argued that there are underlying structural factors that are a function of continuing rigidities in the labour market, and are now firmly ensconced in Enterprise Agreements, that are powerful inhibitors of productivity increases in Australian container terminals.

Fremantle terminals no less than other terminals are similarly constrained. Overtime and overtime loadings are central to the mechanisms for meeting variable demand; the Order of Engagement similarly excludes Supplementary labour; and wages are a function of time on the job, not of productivity.

The strategies for achieving higher productivity in Fremantle terminals will be those common to achieving higher productivity in all Australian terminals; and they will be based on overcoming these problems.

But we underline a critical point that we have raised earlier about the PEP scheme; and it is that if there are to be effective and sustainable increases in productivity they will derive from a detailed understanding of the uniqueness of individual terminals in the light of the underlying determinants of productivity and terminal efficiency.

6: SUMMARY AND CONCLUSIONS

6.1 Enterprise Agreements Have Not Delivered?

Why is it that, after an intensive and expensive process of waterfront reform container terminal productivity remains low - and much lower than it ought to be or than we might expect? The Inter-State Commission made much of the need to create a competitive market; and the conventional wisdom was, and remains, that competitive restructuring of the market (or markets) would deliver productivity and efficiency gains. Central to the reform process, then, was the creation of enterprise employment; and the negotiation of Enterprise Based Agreements (EBAs) or Enterprise Agreements (EAs) between employer and employees, unions and the ACTU. But five years down the track the new framework offered by EBAs is simply not delivering industry-acceptable productivity.

Why is it so? What are the underlying reasons? Is change possible? And, if so, what sort of change?

6.2 Persistent Rigidities

Porter has argued that

- the **structure** of an industry - 'its underlying economic and technical characteristics' - and
- how firms **position** themselves in that industry will determine how effectively firms will compete in the industry - and how efficient and productive they may be.

On the one hand enterprise employment, at least theoretically, removes monopoly control of labour; and on the other, again theoretically, it provides the opportunity for the firm to exert control over its labour inputs - in terms of numbers, conditions, organisation and so on. In short, it allows a firm to seek competitive advantage over other firms. For firms in the container terminals market, and in stevedoring generally, such an ability to control labour resources is critical given the day-to-day need to meet a highly variable demand - of ships, cargo, truck and rail traffic. The new EBA framework, set in place by the Waterfront Industry Reform Authority (WIRA), might then be expected to reflect this new competitive structuring.

Not so; in fact it has handed the industry a double whammy. Not only does monopoly power continue to exist in the labour market but also labour market rigidities are now firmly ensconced in the EBAs - in effect the operating rules for the enterprises.

6.3 Why EBAs (or EAs) Lock In Low Productivity

How, in fact, do current EBAs for container terminal stevedoring firms lock in low productivity? What is it in the EBA framework that prevents an efficient and effective allocation of resources to terminal operations? How do firms deal with the problem of variable demand under existing EBAs?

The short answer is that Overtime and Overtime Loadings (or Penalty Rates) are the key elements in current strategies for meeting variable demand.

They result from

- corporate policies in the post-WIRA period which have set strict limits to the number of Permanents in the workforce;
- Union policies which, through the Order of Engagement, have set strict limits to the amount of labour that can be supplied as Supplementary or casual labour; and have created a preferential system that places Permanents ahead of other labour classifications for Overtime; and

- a wage structuring mechanism that rewards overtime more than Productivity and that creates wages as a function of time spent on the job, not of productivity.

Thus

$$\text{Wage} = \text{Shift Loading} + \text{Overtime Loading} + \text{Productivity Bonus}$$

The outcomes are, among other things

- long hours of work - since Overtime is more highly rewarded than productivity;
- low productivity - since the rewards are high for consuming time taken to complete a task; and
- very high wages - which reflect the relatively high Overtime Loadings and the number of Overtime shifts involved.

6.4 Is There A Better Way?

Terminal operators are reluctant to add labour since

- it adds significantly to fixed costs;
- under current conditions it is difficult for firms to adjust downwards their Permanent workforce; and
- it does not overcome the problem of defining wages as a function of time spent on the job.

Nor are Unions willing to substitute Supplementaries for Permanent labour since

- there is a desire to see the waterfront serviced by permanent, skilled staff in a stable work environment; and
- some supplementaries are former employees and are seen to be gaining an unfair financial advantage (since they have already accepted redundancy packages).

The key is to substitute higher productivity for Overtime - and hence higher rewards for productivity. It is to make wages a function of productivity, not of time.

The CTAL Productivity Employment Proposal - or PEP scheme - is an attempt to embrace these principles. In effect, it sets

$$\text{Wage} = \text{Average Weekly Rate (AWR)} + \text{Productivity Loading}$$

in which the AWR is a guaranteed baseload wage, adjusted for different skill levels and the Productivity Loading provides substantial rewards for performance at industry-acceptable levels of 24 containers per crane hour and truck handling times of 20 minutes. Higher rewards result from even higher shift productivities.

In fact, however, the wage equation will still contain an overtime component. It will be significantly reduced and will provide the 'safety net' that terminals will require under particular demand conditions. But strict requirements may need to be set in place to ensure that overtime payments are not manipulated to reduce productivity and/or inflate wage levels.

The scheme is not without its difficulties ; but it is a significant attempt not only to increase productivity but also to do so by dealing with some of the rigidities which impose constraints on competitive efficiency.

We register a note of caution here; and it is that, although the underlying **principles** of the PEP scheme suggest that it has relevance for other ports or terminals it is imperative that each be assessed as a unique operation and this uniqueness will determine the appropriate wage, revenue and profit outcomes. The Scheme has been designed specifically for high throughput terminals; but in regional ports in which there is likely to be a relatively large proportion of idle time the 'no collection' characteristics of the Scheme may require extensive modification.

6.5 The Central Finding

The central finding of this project, and of overriding importance, is

- that any substantial and sustainable increase in stevedoring productivity at container terminals will only result, under present industrial relations conditions, from major reformulation of Enterprise Agreements in such a way as to ensure that productivity is more highly rewarded than time spent on the job.

6.6 Other Findings

The Terms of Reference of this project, commissioned by the Western Australian Department of Transport, invited special comments relevant to the Western Australian experience and, of course, to the Port of Fremantle.

6.6.1 Productivity at terminals in the Port of Fremantle: We have found that a number of particular conditions have impacted on productivity at the Fremantle terminals including

- significant alienation of the workforce and Government - and by association the workforce and management - through 1995 as a result of disputes associated with the attempted introduction of new stevedoring operations, the operation of Stateships and the CRA-related labour issues. Regrettably, these actions - quite

beyond any terminal-related productivity issues and outside management control
- have provided a culture of confrontation that will take some time to change.

- the use of old and, in some cases, inefficient equipment;
- operation on unconsolidated terminal and berth space;
- operations that mix general cargo and container handling; and
- the poor presentation of vessels;

but it has also found

- that, given these particular difficulties, strategies for achieving higher productivity in Fremantle terminals will also be those common to achieving higher productivity in other Australian terminals.

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Certainly, without access to records and to the frank opinions of these senior people in the container handling industry it would have been extremely difficult for us to even begin to understand the complexities of this industry.

We accept, of course, the responsibility for any errors or misinterpretations.

The PEP Scheme was formally introduced at the Sydney terminal in late February; on March 2 a new Coalition Government replaced an existing Labor Government; and in late March P&O Ports announced that a new Enterprise Agreement concluded with employees at the Fremantle terminal.

This Report was substantially completed before these events - each likely to have important implications for productivity; but at Appendix 3 we have added a description of the new Enterprise Agreement, implemented from April 22, at the P&O Ports terminal in Fremantle.

NOTES

¹ See BIE (1995), *Waterfront 1995, International Benchmarking* AGPS -

"As Australia's traded industries become more exposed to the pressures of international competition there is an increasing need for infrastructure services (sic) to be supplied on an internationally competitive basis. In the absence of market forces, performance benchmarks can be used to promote productivity improvements", p.iii.

² Michael Porter argues this case in seeking to understand the economic well-being of nations as well as firms -

"The search for a convincing explanation of both national and firm prosperity must begin by asking the right question. We must abandon the whole notion of a "competitive nation" as a term having much meaning for economic prosperity. The principal economic goal of a nation is to produce a high and rising standard of living for its citizens. The ability to do so depends not on the amorphous notion of "competitiveness" but on the productivity with which a nation's resources (labour and capital) are employed. Productivity is the value of the output produced by a unit of labour or capital. It depends on both the quality and features of products (which determine the prices they can command) and the efficiency with which they are produced".

Porter, ME (1990), *The Competitive Advantage of Nations*, Macmillan, London, p.6.

³ A number of reports are available detailing productivity measures for Australian (and in some cases, overseas) ports. See for example

BIE (1993), *International Performance Indicators: Waterfront*, Research Report 47, AGPS, Canberra.

BIE (1995), *op.cit.*

BTCE (1995), *Review of the Waterfront Industry Programme*, Report 91, AGPS.

BTCE (1995), *Waterline*, No 4, October.

Centre for Transport Policy Analysis (1993), *Australia New Zealand Direct Line and Waterfront Reform: Impacts and Implications*, The University of Wollongong.

PSA (1995), *Monitoring of Stevedoring Costs and Charges and Terminal Handling Charges* No 5, Report No 26, Melbourne.

WIRA (1992), *Final Report*, October, Canberra.

WIRA (1992), *Performance Indicators*, September, Canberra.

⁴ See BTCE, *Waterline*, No 4, October 1995. See also,

BTCE (1995), *Review of the Waterfront Industry Reform Programme*, Report 91, AGPS, Chapter 3. Note, however, that some terminals have shown continuing improvements in productivity. The Conaust terminal at Fremantle, for example, has shown productivity improvements every year since the initial EBA was instituted in November 1991.

⁵ Inter-State Commission (1989), *Waterfront Investigation, Conclusions and Recommendations*, AGPS, pxvii.

⁶ *ibid.*, pxviii.

⁷ *ibid.*, p144.

⁸ See Waterfront Industry Reform Authority (1992), *Final Report*, October, Attachment A.

The Authority was set up in July 1989; and the In-Principle Agreement (IPA) was '... negotiated between the Stevedoring Employers and Unions and the ACTU under the auspices of the Waterfront Industry Reform Authority ... The IPA formally came into effect on 1 November 1989 and ended on 31 October

1992'.

⁹ See Porter, ME (1990), *The Competitive Advantage of Nations*, Macmillan, London, Chapter 2.

¹⁰ *ibid.*, p40.

¹¹ See Centre for Transport Policy Analysis (1986), *Truck Delays and Container Terminal Operations CTAL Terminal, September-November 1984*, Summary Report to the Joint Working Party of the NSW Cargo Facilitation Committee and the NSW Road Freight Industry Council.

¹² *ibid.*, p35.

¹³ See Centre for Transport Policy Analysis (1988), *Economic Implications of Waterfront Industry Structures*, Report prepared for the Inter-State Commission. Reprinted in

Inter-State Commission (1988), *Waterfront Investigation, Preliminary Findings and Discussion Papers*, AGPS, Volume 4.

¹⁴ See Dick, H and Robinson, R (1992), 'Waterfront reform: the next phase', Paper presented at the National Agricultural and Resources Outlook Conference, ABARE, Canberra, p1.

Inter-State Commission (1989), *op.cit.*, pxvi.

¹⁶ Waterfront Industry Reform Authority (1992), *op.cit.*, p5.

¹⁷ This section of the report draws on a briefing paper, *CTAL Productivity Employment Proposal (PEP)*, and detailed statistical analysis kindly made available to the Centre by P&O Ports. It also reflects discussions with senior staff on a number of occasions. The details of the scheme were those current at the end of 1995. Interpretations are, of course, those of the authors as are any errors or misunderstandings.

APPENDIX 1
The CTAL Productivity Scheme

The CTAL Productivity Scheme

Outline of Scheme

The performance related productivity scheme is based on a threshold number of TEUs handled per crane hour as calculated for all vessels over a period of one week.

The size of the bonus pool to be distributed is variable on a sliding scale reflecting:

- Number of TEUs handled in the week
- Crane hour performance rates

The minimum (threshold) performance rate for any bonus to be paid is 18 TEU per crane hour, labour on to labour off vessel, averaged for all vessels over each week.

Who Participates

All employees from Stevedoring Industry Grade 2 to Grade 7 shall participate in the productivity scheme.

Payment of Bonus Pool

Payment will be made weekly when the calculation of the previous week's container handling performance has occurred.

The sliding scale of payments is as follows:

PRODUCTIVITY SCHEME RATED													
TeuS per Crane Hour	18	19	20	21	22	23	24	25	26	27	28	29	30
Bonus (\$) per TEU	7.20	7.60	8.00	8.40	8.80	9.20	9.60	10.00	10.40	10.80	11.20	11.60	12.00

Distribution of Bonus Pool

The bonus pool will be distributed among employees on the basis of man shifts worked during the week while ships were working.

e.g. Total bonus pool for the week	=	\$25,000
Total man shifts worked	=	1,250
Bonus per man shift	=	<u>25,000</u>
		1,250 = \$20.00

Each employees' share of the bonus pool will be the number of man shifts he worked during the week multiplied by the bonus per man shift.

e.g. Man shift worked by employee	=	5
Bonus per man shift	=	\$20.00
Employees share of bonus pool	=	\$100.00

Source: *CTAL Enterprise Agreement 1994-1996*, p41

APPENDIX 2

Variables used in the CTAL simulation model

The data on which the analysis was performed were as follows

- for each day over a period of 24 days
- for each shift - Midnight, Day and Evening

Vessel information

1. Name
2. Shifts alongside by day and shift
3. Number of import containers exchanged
4. Number of export containers exchanged
5. Total number of containers exchanged
6. Total number of import containers exchanged
7. Total number of export containers exchanged

Receival and Delivery by Road

8. Imports
9. Exports
10. Total
11. Consolidation
12. Total containers in yard

Receival and Delivery by Rail

13. Received
14. Delivered
15. Total

16. Quarantine

17. Number of gantry cranes utilised

Labour Utilisation and Disposition (Numbers)

18. Ordinary Regulars
19. Ordinary Irregulars
20. Double headers
21. Supplementary
22. Overtime
23. Labour in

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Robinson & Everett

24. Labour out
25. Idle time
26. Annual Leave
27. Sick Leave
28. Rostered Day Off
29. Rostered Week Off
30. Work care
31. Day in lieu
32. Long Service Leave
33. Other Leave
34. Unpaid leave
35. Training
36. Total establishment
37. Man Shifts Used
38. Excess/shortage of labour
39. Productive man shifts
40. Unproductive man shifts

APPENDIX 3

**The New P&O Ports
Fremantle Enterprise Agreement, 1996**

The following is the text of a Press Release from P&O Ports on 25 March 1996 and describes the main characteristics of a new Enterprise Agreement.

“FREMANTLE ENTERPRISE AGREEMENT 1996

A new Enterprise Agreement has been agreed with P&O Ports employees at Fremantle and is scheduled to be introduced on Monday 22 April 1996.

Some of the features of the Container Division Enterprise Agreement are as follows:

- The workforce will be split into the two P&O Ports Divisions, Bulk & General Cargo Division and Container Division.
- The Container Division will have a dedicated workforce, including supervisors.
- There will be recruitment of Permanent Employees, Guaranteed Wage Employees (GWEs), Supplementary Employee and Australian Vocational Trainees (AVTs). The recruitment process has commenced.
- A 14x1 roster will be introduced. This involves extending each shift by half an hour to 7-1/2 hours. The additional half hour worked will count towards a week off after working fourteen weeks.
- Shift times and working arrangements will change. The shift times are:
 - Day Shift 0700 - 1430
 - Evening Shift 1415 - 2145
 - Night shift 2130 - 0500

Note there is a 15 minute overlap between the day and evening shifts. This is to allow "hot seat changeovers" and work will not stop at the change of shift.

- It will be possible to work vessels nonstop from 0700-0500 the following morning.
- Road receivals and deliveries will commence at 0700 and continue to 2130. Continuous receivals and deliveries will occur during the day shift and during shift changeover. The evening shift has traditionally been relatively quiet and meal breaks will occur at 1645-1710 and 1915-1935. However, if sufficient trucks regularly use the evening shift, continuity will be arranged.
- When there is no following shift, day and evening shifts may be extended by one or two hours for any reason.

Night shifts may be extended one hour for the purpose of finishing a vessel or job.

- Double headers will be limited to two a week and may not be worked on consecutive days.

We expect the new EA to have a positive affect on our service levels and productivity, and there will be a further significant improvement once consolidation has been completed.”



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