Lost at Sea:

An Assessment of the Productivity Commission's Report on Container Port Productivity

By Dr Phil Toner

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Introduction and Summary

The Productivity Commission has recently published a review of productivity performance in Australia's maritime logistics industry, including the operation of container ports and related services. The Commission's draft report (Productivity Commission, 2022a) concludes that Australian ports are characterised by underperformance on some productivity measures, and makes several strong recommendations (including for significant changes to industrial relations practices in the industry, and more broadly) to improve productivity. These conclusions and recommendations, however, are not supported by a more careful look at the empirical evidence – including data assembled in the Commission's own report. The claim that industrial relations issues have somehow damaged the fundamental economic efficiency of our container port system reflects the pre-determined assumptions and biases of Productivity Commission analysts, more than a fair judgment of the actual performance of Australia's container port system. By numerous measures, our ports have fulfilled their mission to provide quality, reliable service in supporting Australia's international trade. This paper critically reviews the assumptions, methodology, data sources, and conclusions of the Productivity Commission's draft report, and urges a more balanced and careful look at the evidence.

The Terms of Reference for the Productivity Commission (PC) study set by the former Treasurer in December 2021 were remarkably broad, requiring it to conduct an 'inquiry into the long-term productivity of Australia's maritime logistics system'. This included consideration of the full supply chain from international shipping lines; tugs and towage; port management; government services such as customs and biosecurity; the stevedoring industry including its labour market and industrial relations systems; rail and truck transport; urban and transport planning; and proposals to re-create a sovereign domestic and international shipping fleet. Given the large scope of the resulting PC draft report, this study focuses on three key arguments.

First, in Section 1 of the report, we begin with a brief overview of the PC's general approach to 'economic reform' over the last four decades, including strongly promoting policies such as privatisation, labour market deregulation and enhanced managerial prerogative. These policies were explicitly intended to lift productivity and increase competition, innovation and incomes. However, over that period the actual outcomes have included a long-run decline in the productivity growth rate; increased corporate concentration and market pricing power; a mixed record on innovation; declining real wages; and growing income and wealth inequality. It is important to

critically assess the validity of the PC's overall approach to economic reform across the whole economy (founded on strong assumptions about the virtues of private, deregulated competition), since it proposes a similar suite of measures for the Australian waterfront.

Then, in Section 2, a detailed examination is provided of the metrics used by the PC to measure port productivity. The key conclusion is that these metrics show Australian stevedoring labour productivity is equivalent to international standards.

Finally, in Section 3, an assessment is made of the PC's claims that current industrial relations arrangements and work practices have an adverse impact on port productivity, and industrial disputes impose costs or negative externalities on the wider economy. These two claims largely underpin the key PC recommendations to change the *Fair Work Act* to restrict the scope and scale of union activity on the waterfront. The PC admits there is no substantive evidence for the first claim. And in making the second claim the Draft report is contradicting decades of stern advice from the PC itself that unquantified externalities are a weak basis for public policy, and that redressing government induced market 'distortions' risks further unintended consequences and 'government failure'.

The PC's core arguments regarding supposed union 'dominance' and the impact of certain work practices on port efficiency are unreasonable and deficient: they lack substantive quantitative evidence, and are internally inconsistent. The absence of 'hard' evidence for these claims is freely admitted by the PC, but this does not deter it from advancing a number of draft findings which presume that such evidence exists and is highly robust. These claims ultimately reflect a pre-ordained inclination by the Commission to scapegoat anything which moderates or regulates the profit-seeking activity of private businesses, not a fair examination of concrete evidence regarding the practical efficiency of Australia's container ports. The PC also fails to consider the legitimate reasons why labour seeks to limit managerial prerogative in the first place: such as concerns over various forms of so-called labour 'flexibility,' and the adverse effect for worker welfare, safety, and productivity arising from an expansion in management prerogative. Moreover, in making the case that 'negative externalities' generated by the stevedoring industry are a basis for government intervention (including far-reaching intrusions into industrial relations practices), the PC is directly contradicting its long-standing position that such arguments (based on alleged externalities) not only require a very high evidentiary base, but also must consider the substantial risk of 'government failure' in implementing 'second best' solutions. In sum, the PC's case for changes to the FWA to offset supposed negative externalities from stevedoring industrial practices fails to meet its own conditions, and should be rejected.

1. The Long-Run Impact of Productivity Commission 'Economic Reforms'

Over the last 40 years the Australian economy has been transformed by an integrated series of changes collectively known as 'microeconomic reform'. These changes included: removal of tariffs, 'commercialisation, corporatisation and privatisation initiatives for government business enterprises' such as electricity networks and ports; 'competitive tendering and contracting out' of government services such as those for employment, aged care, vocational education and training; 'taxation reform' especially lowering corporate and personal tax rates; 'the shift from centralised wage fixing to enterprise bargaining…and the introduction of individual employment contracts' (Productivity Commission 2020:33).

Not only did the Commission strongly endorse these changes but, among Australian government central economic agencies, it was the leading advocate for them. The anticipated outcome of microeconomic reform was to increase 'domestic and international competition' resulting in 'a more efficient allocation of resources and a more vigorous pursuit of productivity improvement' (Productivity Commission 2020: 33).

But what were the actual outcomes of these reforms? The following focuses on three measures of whether this microeconomic reform agenda has in fact been successful: productivity growth, industry concentration and falling real wages.

1.1 PRODUCTIVITY GROWTH

During the second half of the 1990s there was indeed a surge in the productivity growth rate shortly after the adoption of 'microeconomic reform.' This led the Commission and its many supporters in business and academia to proclaim these results a 'productivity miracle' and this period a 'golden age' of productivity reform (Parham 2004). However, productivity growth declined in subsequent decades, which 'seems to suggest that these reforms had a level effect on productivity, leading to a series of one-off boosts but no change in the permanent rate of growth' (Productivity Commission 2020:34). Excluding the second half of the 1990s, Australian productivity performance over the last 4 decades was no better or worse than the earlier

performance in the 1970s (Productivity Commission 2020: Figure 20). Indeed, Australia's comparative labour productivity performance from 1950 to 1970 exceeded that of the supposed leading economy: the US (Productivity Commission 2020: Figure 14). Other data shows productivity growth from the 1960s to the early 1980s as equal to or exceeding that in most periods in subsequent decades (Parham 2004: Figure 2.2). This was a period well before 'microeconomic reform' and was marked by centralised wage fixing; high rates of industrial disputes; high levels of public ownership of core infrastructure; and high tariffs and capital controls – in other words, the very policies the PC argues constrain productivity.

There is also great debate over the causes of the productivity surge in the second half of the 1990s. Quiggin (2010) attributes the growth in productivity in the latter half of the 1990s to unsustainable 'work intensification' as workers produced 'more with less'. (One measure of work intensification is the growth of unpaid overtime, where these additional hours worked would not be fully captured by the Australian Bureau of Statistics estimates of productivity as a growth in inputs). Given there are strict limits on how far these gains can be extracted, this explains the subsequent slowdown in productivity growth over the following decades. Industries that showed particularly strong productivity growth during the late 1990s boom were Communications and Electricity, Gas and Water, which seemed to confirm the merits of privatisation and corporatisation of formerly public assets.

However, Treasury attributes productivity gains in these two industries to 'substantial reductions in their workforces following corporatisation and privatisation of their operations, and a reduction in their levels of investment. Productivity levels in these industries rose towards the international technological frontier' (Dolman & Gruen 2012: 2). But as with work intensification there are strict limits to how long an industry can extract productivity gains by cutting labour and investment. This is clear from the fact that in 19 of the 22 years from 1990-2000 to 2021-21 the Electricity, Gas and Water industry experienced annual declines in productivity (ABS 2022a: Table 25). Thus the 'one-off' rise in productivity in Electricity, Gas and Water in the latter 1990s was reversed over later decades. This was due to a sustained lift in investment and employment to compensate for previous under-investment, and changes to the regulated rate of return that increased the incentive to invest in de-carbonising electricity generation.

1.2 INDUSTRY CONCENTRATION, INCREASED CORPORATE MARKET POWER AND FALLING WAGES SHARE

Increased competition was intended to be both a means and an end of microeconomic reform, resulting in progressively higher efficiency, lower 'market power' of firms and reduced prices for consumers and producers. Recent research by federal Treasury indicates that since 2000 the opposite has occurred, as a 'range of metrics point towards declining competitive pressures in Australia' (Treasury 2022: 19). Over the last two decades:

- The 'average market share of top four firms in each industry' has increased;

- 'incumbency,' measured by the proportion of top 4 firms in an industry that remain among the top for a substantial period, increased; and

- The 'market power' of firms as measured by firms' mark-ups, or the ratio of a firm's price to its marginal cost of production, has increased. In simple terms, firms now have greater ability to influence the price they receive for the goods and services they sell. Average firm mark-ups increased by around 6 per cent.

Treasury (2022: 19) concludes that 'the decline in competitive pressure appears to have weighed on aggregate productivity growth'. A number of explanations are advanced by Treasury for the decline in competitive pressure, such as the 'digitisation' of production which is associated with scale economies and intellectual property that impose high barriers to entry of new firms. Whatever the causes, the main conclusion is there has been a significant and generalised increase in corporate market power, and these outcomes are clearly inconsistent with the objectives of microeconomic reform.

A separate convincing reason for declining competitive pressure following microeconomic reform was advanced by the former head of the Australian Competition and Consumer Commission, Rod Simms, who highlighted privatisation of state assets, and especially the desire of governments to maximise cash sale returns by not imposing price regulation or other pro-competitive measures on new private owners. The absence of these restrictions on new owners reduced the future efficiency of the transferred assets.

> 'The question we've got to ask is, do we want our ports, our airports, our telecommunications, our all sorts of things to help economic

efficiency or do we just want them to be cash cows that, frankly, become a drag on our economic efficiency?'

Mr. Simms made these comments in the context of the ACCC appealing the loss of a Federal Court case after alleging the $5.1 billion privatisation of Port Botany in 2013 was anti-competitive – because the NSW government allowed compensation to be paid to the port's new owners if a rival container terminal is eventually developed in Newcastle.

Finally, the PC was and is in the vanguard of economic agencies promoting 'labour market flexibility,' through measures such as enterprise bargaining, individual contracts, 'simplifying' award conditions, reducing penalty rates, increased access by employers to casual and contract workers, labour hire and self-employed, and payment systems such as piece rates and performance-based pay. More generally, and also to stimulate labour flexibility, the PC also supports an overall expansion of managerial prerogative.

For example, in its 2010 inquiry into the TAFE workforce it concluded that 'more managerial autonomy for TAFEs to link performance with pay, set wages and engage people on the most appropriate employment arrangements for their specific needs would help with recruiting and retaining necessary staff' (PC 2010: p.7.1). More recently the former head of the PC, Gary Banks, identified a lack of managerial prerogative as a continuing barrier to productivity growth. He condemned the current 'industrial relations system that contains a multitude of restrictions on managerial decisions about how production is organised – imposing costs that…are hard to justify on fairness grounds' (Banks 2018: 6). An expansion of managerial prerogative is also recommended in the present maritime logistics inquiry (PC 2022a: 28).

An outcome of the labour market flexibility advanced by the PC over the decades is a broad reduction in the bargaining power of labour which has contributed to rising income and wealth inequality, the large shift in national income from labour to capital, and (more recently) declining real wages (Stanford 2018).

1.3 IMPLICATIONS

The PC cannot disassociate itself from the perverse outcomes arising from its vision of microeconomic reform over the decades, with claims that its plans were improperly implemented or require more time for markets to form some new and more efficient competitive equilibrium.

There are three principal failings with the PC approach which have produced these perverse outcomes.

First, the PC failed to understand the broader institutional context, in particular, the inadequacy of Australia's weak competition laws to prevent growth of market power in highly concentrated industries. Some prime examples include the inability of the ACCC to over-turn the Port Botany monopoly on NSW container traffic, and the consolidation of Australia's banks – whereby Australia's '4-pillar' banks constitute the most oligopolistic and profitable banking system in the OECD, as measured by bank profits as a share of GDP (Australian Institute 2016). The PC was also extremely naive regarding the invidious position in which microeconomic reform placed the states. On the one hand the states were actively encouraged to sell income-producing assets whose profits made a significant contribution to state revenues. But on the other hand, this lost income stream forced the states to minimise pro-competitive conditions attached to asset sales, that would lower buyers' future returns and therefore reduce the prices buyers were prepared to pay.

Second, the PC persistently under-estimates those powerful market forces in the modern economy, previously alluded to, that amplify scale economies, create barriers to new entrants and propagate market concentration (Brookings Institution 2019). These forces include digitisation of production, network effects and lowering international trade barriers. Through its push for deregulation, the PC further unleashed these forces, leading to greater corporate concentration.

Thirdly, the PC also did not understand the real-world markets it was creating in advocating the contracting-out of government human services. The PC naively relied on the idea that the combined effect of competition and 'consumer sovereignty' would ensure private delivery of high quality, low-cost services. The actual results are a series of scandals and royal commissions into service provider misconduct and rising costs (Cahill and Toner 2018; Meagher et al 2022). Equally, its advocacy of labour market 'reform' and enhanced managerial prerogative in the face of continuing unfair shifts in the distribution of national income and falling real wages reflects a profound misunderstanding of the forces at work in contemporary labour markets.

The point of this analysis is that the longer-run effects of microeconomic reform championed by the PC over the last 4 decades on productivity growth rates were either negligible or even perverse. Productivity growth in the decades prior to microeconomic reform was higher than for the last decades taken as a whole. The determinants of long-run productivity growth reflect fundamental factors such as rates of scientific and technical change, investment in capital equipment and ICT, innovation, investment in people and growth of demand (Quiggin 2010). These

fundamental determinants have either not been influenced by changes wrought by microeconomic reform, or else the impact of reform on these determinants has been negative.

An example of the latter is that non-mining private capital investment as a share of GDP has fallen dramatically from well over 15% over the 1960s and early 1970s to around 10% during the period of microeconomic reform (from the 1990s to the present; RBA 2018). This fall is attributed in part to the demise of manufacturing industry 'given that the manufacturing industry is more investment intensive than other industries' (RBA 2018). Ironically, manufacturing was the key sector targeted by the PC for 'structural adjustment' by removing various types of assistance. Investment is a key driver of productivity as new technologies are embodied in new generations of equipment and software, and it allows for the mechanisation and automation of production processes. Moreover, the outcome of enhanced competition has not been achieved: rather, firm concentration and corporate pricing power has increased.

Despite the historic failure of its general microeconomic reform vision, the PC now seeks to apply the same logic to the maritime logistics industry. It focuses on enhanced labour market flexibility, managerial prerogative, and adopting an ambiguous attitude to high corporate concentration within key segments of the industry (such as towage, ports and terminal operators). At the same time, the impact of unionisation and industrial relations is singled out for special critical attention, as a supposed 'barrier' to the operation of competitive forces in this industry – despite the obvious concentrated, anti-competitive power of the businesses which dominate the sector.

For all these reasons, the PC's draft report and recommendations should be carefully and critically reviewed. They are likely to reflect the Commission's overall mindset that unregulated business interests are best-placed to achieve strong efficiency and competitive outcomes – and correspondingly that interference (from governments, unions, or any other countervailing forces) should be curtailed. The rest of this paper will show how the PC's draft report on maritime logistics indeed reflects and preserves these predetermined biases. A more careful and balanced look at the economic evidence regarding container port efficiency does not support the PC's knee-jerk conclusion that union activity and industrial relations practices must be suppressed in order to achieve world-class efficiency in Australian ports.

2. The Commission's Port Productivity Analysis

The PC draft report itself admits there is insufficient data to accurately measure productivity in Australian container ports – in particular regarding the intensity of labour and capital use. Other inadequacies in data affect its measurement of the overall quantity of capital and labour employed, and its efforts to control or account for international differences in the characteristics of capital and labour inputs that may give rise to differences in productivity growth rates or levels.[1] The latter is especially important, as current data does not control for the multitude of influences on productivity identified in the international literature; thus comparisons of local and international port productivity are methodologically unsound. Similarly, the PC also states there is no 'hard data' on the link between negotiated industrial relations arrangements and port efficiency.

The inadequacy of basic empirical evidence, acknowledged by the PC itself, calls into question both the rationale for undertaking this inquiry (which was, after all, mandated by a previous government intent on raising ideological fears about supposed union disruptions in Australia's economy in the lead-up to a general election), and its eventual analysis and findings. We now turn to a discussion of these deficiencies in the productivity data.

2.1 DATA PROBLEMS PRECLUDE ACCURATE PRODUCTIVITY ESTIMATES

The PC (2022: 9) correctly notes that productivity measures should perform three important functions:

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[1] A good example of controlling for international differences is the metric 'ship turnaround time' which measures the time taken to unload and load a ship from arrival at the quay to departure. A critical determinant of the time taken to turn a container ship around is the number of cranes (crane intensity) deployed per ship. Since ports internationally vary greatly in the number of cranes per ship the ship turnaround time has to be adjusted or 'controlled' for differences in crane intensity. Controlling for crane intensity is relatively straightforward, but even here there are also differences in the type of cranes and their relative efficiency in moving containers per unit time. Other metrics of port productivity also need to be 'controlled' to ensure valid international productivity comparisons, but there appears to be no agreed standards for controlling for these differences.

- First, accurately measure productivity (or output per unit of input per unit time);
- Second, illuminate the key sources of productivity growth; and
- Third, 'understand *why*' constraints on productivity growth arise.

However, the PC frankly admits that currently available data is totally inadequate to accurately measure maritime productivity in Australia:

> 'Current Australian data collections do not support comprehensive analysis of this type. Data are missing for a number of areas of port performance, including, for example, labour inputs (the number and type of workers and the hours they work), cargo operation times (the time spent loading and unloading a ship while it is at berth), and container dwell times (the time containers spend in port after being discharged from a ship until loading onto land transport, in the case of imports).' (PC 2022a: 9).

> 'There is also an absence of ship arrival and window data. Ports may appear inefficient if many ships miss their windows and are forced to spend time at anchor. But this may be an inaccurate reflection of the port's performance. Instead, this could reflect inefficiencies on the part of shipping lines (or external factors that cause ships to miss their windows) or another port (given multiport calls are a feature of Australian ports, delays at one port can cascade through the system). Information on ships missing windows and arrival schedules could help to correctly attribute inefficiencies, especially in relation to anchorage times' (PC 2022b:21).

There is no data to accurately measure productivity and in particular account for the intensity of labour and capital use; the overall quantity of capital and labour employed; and to control for international differences in the characteristics of capital and labour inputs. The latter is especially important as current data does not control for the multitude of influences on productivity identified in the international literature, such as major differences in port characteristics (including dock area); 'terminal congestion' and efficiency of tug operations, government customs and health border inspections; and 'landside' truck and rail transport links. (This issue is discussed further in Section 3 of this report).

There is also no 'hard data' on the link between negotiated industrial relations arrangements and port efficiency:

'There is substantial evidence of the effects of workplace relations on productivity. However, it is not the sole driver of changes in productivity, meaning it is difficult to demonstrate any link using only quantitative methods' (PC 2022a: 247).

'[T]there are no aggregate data available on labour productivity at Australian ports... This means that it is not possible to clearly identify the factors that have driven better overall productivity, nor what might have prevented productivity growth from being stronger. As discussed above, this is not evidence that workplace arrangements do not affect productivity in Australian ports, simply that showing that link through data is not straight forward' (PC 2022a: 259).

Despite being 'difficult to demonstrate any link' and having 'no aggregate data available on labour productivity at Australian ports', this does not restrain the PC from proposing highly prescriptive interventions. The absence of comprehensive productivity data is a key admission by the PC and calls into question both the rationale for undertaking the Inquiry and the report's analysis and findings.

Given the absence of theoretically sound and empirically feasible port productivity measures, the PC is forced to rely on partial measures of productivity that the Commission itself acknowledges are flawed and provide ambiguous and even conflicting results.

2.2 STEVEDORING OUTPUT AND PRODUCTIVITY GROWTH EXCEEDS ECONOMY-WIDE GROWTH

Before outlining the partial productivity measures used by the PC and their deficiencies, it is important to note that output and productivity growth in the stevedoring industry greatly exceeds that in the aggregate economy. Over the 23 years between 1988-89 and 2020-21 the total number of containers (measured in twenty-foot equivalent units, or TEUs) handled at the five major Australian ports, known as annual 'throughput', increased from 1.8m to 8.3m, an annual compound growth rate of 7.8% (ACC 2022: Figure 1.2). This represents a doubling of TEU throughput every 9.2 years. This phenomenal and sustained rate of growth in physical output is not consistent with the claim that output growth in the maritime logistics industry is subject to systematic restraints, as for example is suggested by the PC and ACCC.

It is difficult to get other industry comparators for which conceptually consistent measures of physical, as opposed to money value, of output are available. One suitable

example is exports of Australian iron ore. Over the period 1988-99 to 2020-21, iron ore exports from Australia, measured in millions of tonnes, increased at an annual compound growth rate of 6.42% (Geoscience Australia 2022: Figure 2).[2] Whilst the rapid growth of iron ore exports is lauded (ABS 2021b), similar plaudits are not forthcoming for the maritime logistics industry.

Other productivity measures also put the performance of the maritime logistics industry in a favourable light, such as data collected by the ACCC from a variety of sources as part of its monitoring of stevedoring prices and performance. One measure, the 'elapsed labour rate,' is especially pertinent as it 'is an indicator of labour productivity and measures the number of containers handled for the period of time that labour is working on the ship' (ACCC 2021: 57).[3] Over the 22-year period, 1998-99 to 2019-20, the number of containers handled per hour increased from 23 to 50, an annual compound rate of elapsed labour productivity growth of 3.6% (ACCC 202: Figure 6.1). Over the same period labour productivity (GVA per hour worked) for all 'market sector' industries increased at an annual compound rate of just 1.5% (ABS 2021c: Table 15). Therefore, the rate of labour productivity growth in the container stevedoring sector has been more than twice as fast as in the wider economy.

The PC contradicts the ACCC and BITRE interpretation of the elapsed labour rate as representing a labour productivity measure. It argues:

> 'The elapsed labour rate reveals nothing about labour productivity. The measure is defined as the number of containers handled per elapsed labour hour — the time between when labour first boards the ship to when it leaves the ship. Labour productivity is defined as output per worker or per hour worked. The elapsed labour rate does not reflect the number of workers involved nor the average number of hours they worked the ship' (PC 2022b: 18).

This claim would only hold if there was no systematic relation between the number of containers to be moved from or onto a given ship-size and the average number of workers deployed onto that ship and the number of hours they work on average on different size vessels. If the allocation of either the number of workers onto ships and/or the hours they work on a given ship was random, it would follow that the elapsed labour time does not measure labour productivity; but these variables are not

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[2] From around 220m to 920m tonnes over the period.

[3] 'Elapsed labour rate measures the number of containers handled for the period of time between labour first boarding a container ship to labour last leaving the ship, less any time when labour was not working due to delays. It is computed as the number of containers handled divided by the elapsed labour time'.

random. Considerable planning is undertaken by stevedores depending on each specific ship type, the number of containers to be moved, the complexity of the task (some containers may have to be moved onto and off the ship to access the right containers), and available landside container storage availability and truck movements – all to ensure efficient utilisation of labour and other resources (such as crane hours).

If there was no relation between labour resources allocated and a particular task it would imply that management was chaotic in its disposition of resources. Also, against the PC claim is that on the best available data stevedoring employment has remained roughly static over the last two decades but, as shown above, the number of containers moved has increased enormously. This also implies a large rise in labour productivity.

2.3 THE PRODUCTIVITY COMMISSION'S FOUR PRODUCTIVITY MEASURES

In the absence of comprehensive productivity data, the PC suggests four alternative partial measures of container and port productivity.

2.3.1 Crane rates

The PC uses two measures of crane rates or container movements onto and off a ship per hour. These are net and gross crane rates. Net is defined as: 'Container movements per crane per hour of operation' (PC 2022a: 10). In turn, operating time:

> '…relates to the time during which containers are ready to be unloaded and loaded. Gross operating time is the total time during which containers can be lifted; net operating time excludes any operational and non-operational delays. The duration of operating time will be correlated with call size, the number of cranes used and crane productivity — ships with larger call sizes will generally be in port for longer… As the net time will always be the same or lower than the gross time, the resulting net productivity measure will always be the same or higher than the corresponding gross productivity measure…. If the net and gross measures are computed on a consistent basis, then a comparison of them will indicate the extent of delays (that is, the relationship between net and gross times indicates the duration for which cranes and/or labour were unavailable to work a ship)' (PC 2022b: 18).

The list of possible non-operational delays is indeed prodigious (BITR 2022: 20) and is discussed in more detail in section 2.4.4.

The PC uses two measures of net crane rates; net containers processed, and net 'twenty-foot equivalent units' (TEU) processed. First it examines long-term Australian trends from 1989-90 to 2021-22 and concludes that 'measured by net crane rates (container movements per crane per hour of operation), productivity at Australia's container ports rose strongly in the 1990s following significant waterfront reforms, and continued to grow at a slow pace over the following two decades' (PC 2022a: 10). The net container crane rate increased from 20 per crane per hour in 1989-90, to 30 in 2019-20: an increase of 50% (ACCC 2022: Figure 6.1).[4]

The net TEU crane rate increased more dramatically: from 14 per crane per hour to 48, an increase of 243% (PC 2020a: Figure 4). The PC (2022: 10) explains the difference between net container movements and TEUs as due to the fact that 'growth measured in 20-foot equivalent units (TEUs) was stronger than for containers per se, because of the increasing share of 40-foot containers used in trade (which equate to two 20-foot equivalent units)' (PC 2022a: 10). Between 2001-02 to the present the share of 40-foot TEUs increased from around 25% of the total containers to over 60% (ACCC 2022: Figure 4.2). Another implication of the fact that TEU throughput has increased at a much faster rate than total container throughput (due to the increased share of 40-foot containers) is that there has been a disproportionate rise in 'the quantity of goods being moved' (PC 2022:10). Another factor explaining the large rise in total throughput is greater crane intensity per ship, which increased from around 1.4 cranes per ship in 1989-90 to around 2.1 in 2019-20 (ACCC 2020: Figure A7).

It is clear there has been strong productivity growth in both measures of net crane rates. From 1989-90 to 2019-20 the net container crane rate rose by 1.9% p.a. and the net TEU crane rate increased by 5.9% p.a. These are high rates of productivity growth and, as noted earlier, exceed those in the aggregate economy by a wide margin. (There was also variability in the rate of productivity growth over the period, an issue that is highlighted by the PC, and which is discussed later.) In addition, 'The fact that ports are handling larger containers and the crane rate has not declined also points to productivity improvements in terms of the quantity of goods being moved' (PC 2022: 10). That is to say, tonnages of imports and exports have increased at a faster rate than the increase in total containers moved.

2.3.2 Ship turnaround times

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[4] ACCC data is used since the PC data for net container crane rates starts in 1995 but the ACCC data for net TEU crane rate starts in 1989-90.

The PC net crane rate analysis is restricted to Australian ports since data limitations preclude international comparisons of net crane rates. Accordingly, for international comparisons the PC uses data from the World Bank/S&P Global Market Intelligence IHS Markit to examine 'ship turnaround time' or elapsed time from anchorage to ship departure from the dock (PC 2022b: 88). It found that on this metric 'Australia's major container ports with the exception of Brisbane ranked among the worst performing 20 per cent of ports, and Brisbane ranked in the bottom 30 per cent' (PC 2022: 10). However, the apparently slower ship turnaround time in Australian ports is mostly accounted for by the lower crane intensity or number of cranes allocated per ship in Australian ports compared to overseas ports. On average overseas ports allocate roughly one-third more cranes per ship than in Australia. The PC further finds that after controlling for the much higher number of cranes allocated per ship in overseas ports with faster turnaround times that productivity per crane (or 'gross crane rate') in Australian ports is similar to overseas ports: 'On average, Australian cranes were just as productive as the international average' (PC 2022: 10).

The PC reflects on the utility of time-based metrics of productivity such as turnaround times and ship-rates (number of containers moved per hour per ship) by noting these measures have no regard to differences across ports in their inputs. Thus, Yokoyama is ranked the global leader in ship turnaround times on the 2021 Container Port Performance Index (CPPI) produced by the World Bank and IHS Markit, but this is due to much higher levels of inputs – not just cranes, but also many more terminals and berths. Another complicating factor with the metric is that there are significant differences in the lifting capacity of cranes, so that individual cranes can have very different TEU lifting rates per hour. Thus 'top ranked Yokohama had the highest gross crane rates, likely aided by some of their twin lift cranes' (that is, a crane that can handle two forty-foot containers at once; PC 2022b: 53). It is unclear whether the PC controlled for these differences in technology or crane lifting rates across ports, or whether all cranes were regarded as equal in the construction of the ship turnaround metric.

Given that Yokohama port had similar total throughput as Sydney and Melbourne, and controlling for the more intensive use of inputs per container moved, Yokohama was found to be 'less efficient than all five of Australia's major container ports in its use of inputs' (PC 20-22a: 12). This finding led the PC to conclude that 'faster turnaround times are a good thing, but not at any cost'. (The finding that Yokohama port is not 'technically efficient' in its use of inputs was based on the technique of Data Envelope Analysis employed by the PC as an additional measure of port productivity. This is discussed below in section 2.3.3.)

Despite the fact that international comparison of ship turnaround times using the Container Port Performance Index is a poor metric of port performance, the PC insists on using it to make claims regarding the costs of slow turnaround times imposed on Australian industry. To reiterate, the PC analysis of ship turnaround times found that:

- First, after controlling for crane intensity Australian gross crane rates are similar to international averages;
- Second, lifting Australian ship turnaround times would require a large increase in investment to raise crane intensity by around 33% per ship; pursuit of faster turnaround times by raising crane intensity, as in the Yokohama port example, is not 'technically efficient' or leads to an excess and inefficient allocation of capital.

Regardless of these findings, the PC makes the far-fetched claim that 'if all five of Australia's major container ports achieved turnaround times in line with the global average, and passed the resulting cost savings through, Australia's importers and exporters combined could save an estimated $605 million a year' (PC 2022a: 14). This claim that there are potential cost savings of $605m assumes Australian ports can increase their crane intensity by around 33% at zero cost, since the supposed savings do not take account of either the additional capital expenditures to raise the crane rate nor the increased revenue terminal operators need to charge to achieve a return on this investment.

This re-assertion by the PC of the highly problematic Container Port Performance Index to criticise performance of Australian container port operations reflects a fundamental ambiguity in the PC's objectives and policy conclusions. Is the central goal of its inquiry into Australian ports intended to achieve faster turnaround times, with claimed cost savings to port users, or to lift 'technical efficiency', that is, minimise port inputs for a given level of annual throughput? As the Yokohama port example clearly demonstrates, it is not possible to have both. These conflicting goals are evident in the following extended quote, in which the PC seems to be struggling with which objective its inquiry should pursue:

> 'Australian ports do not compare well against international ports on measures of ship turnaround times….Poor rankings in a recent World Bank study of 351 international container ports reflect the fact that Australian ports take longer than many international ports to process ships (particularly medium to larger vessels). This mainly reflects the fact that they use fewer quay cranes to handle containers — average container movements per crane per hour at Australia's ports are similar to those in the average international port.'

These contradictions are discussed in more detail in the following section.

2.3.3 Technical efficiency frontier analysis

Measures such as Australian net and gross crane rates, ship rates and net container and TEU rates indicate high productivity growth over the period. Meanwhile, international comparisons of gross crane rates show Australian ports are just as efficient on average as overseas ports.

The PC investigates international comparisons of port technical efficiency by applying the technique of Data Envelope Analysis (DEA), a linear programming technique to estimate the production function of ports. A production function shows the varying combinations and differing quantities of factors of production that are used to produce a given level of output. The DEA estimates the maximum potential output for a given set of inputs using either constant (Constant Returns to Scale) or variable (Variable Returns to Scale) models.

Put simply, DEA identifies the minimum quantity of inputs that can be used to produce a given level of output, and in effect ranks ports in terms of how efficiently they convert their inputs into output. Specifically, an 'input-oriented DEA model' is employed which 'measures the potential proportionate reduction in input quantity that could be achieved without changing the output quantity' (PC 2022b:63). Ports operating on the technical efficiency frontier receive a score of 1, while those operating within the frontier (that is, ports with the same or more quantity of inputs as frontier firms but producing less output) receive a score less than 1 (PC 2022b: 58). Data for the study was derived from the same World Bank/S&P Global Market Intelligence IHS Markit database used to examine ship turnaround times. The database includes 351 ports but, due to deficiencies in the data and ensuring comparability of ports, only 166 ports were included (PC 2022b: 63). 87 ports or just over half the ports in the sample were deemed to be operating on the 'frontier' or to be technically efficient, while the remainder were found to be 'technically inefficient'.

Adelaide is on the 'technical frontier' achieving a score of 1, while Melbourne is somewhat better than the global average score of 0.89.[5] The other three Australian ports in their sample are below the global average (Table 1). 'The results suggests that most Australian ports are not technically efficient. This implies that most ports could

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[5] Interestingly, Adelaide and the six main ports in South Australia are a monopoly, owned and operated by one company. The PC remains silent on the fact that the only Australian port to achieve a 'best practice' DEA score lacks the very thing that the PC assumes drives efficiency: namely, competition. Similarly, as indicated in Table 1, there is a partial inverse relationship between the number of terminals in a port, and its 'technical efficiency,' suggesting a trade-off between regional competition (and resulting duplication of capital infrastructure) and efficiency as defined in the DEA methodology.

reduce their physical inputs to achieve the same level of output. An alternative interpretation is that most Australian ports should be able to cope with an increase in throughput by using their inputs more efficiently' (PC 2022b: 64).

Table 1 Technical Efficiency Scores for Australian Ports

	VRS score	Number of Terminals	Percentage gap from global average score (.89)
Adelaide	1.00	1	+11%
Sydney	0.75	3	-19%
Brisbane	0.71	3	-25%
Melbourne	0.90	3	+1%
Fremantle	0.73	2	-22%
Derived from PC 2022b: Table 11 (A negative sign means the port score is below the global average).			

It will be shown that this conclusion is unsound because of data limitations and invalid assumptions necessary to effect the DEA analysis. Moreover, more compelling alternative explanations are available for the DEA results, which are not consistent with conclusions about the supposed technical inefficiency of Australian ports. Finally, the policy implications of the DEA analysis are either absurd or once again, highlight the dilemma the PC has created for itself in posing conflicting conceptions of port 'input-output efficiency' against faster ship turnaround times.

Before progressing onto a review of the statistical methods it is worth noting that the actual results of the DEA are ambiguous. The PC emphasises that 'most Australian ports are not technically efficient.' But another interpretation of the same results could emphasise that one of the five ports is on the 'technical frontier,' and another is above the global average. Therefore, industrial relations *per se* in Australia cannot be a barrier to high performance, by somehow blocking investment in new technology and full utilisation of inputs. This is important since the PC gives great weight to industrial relations matters in its analysis of port performance and recommendations for change.

Problems with the PC's Technical Efficiency Frontier Analysis

Data Limitations: The PC DEA exercise used a single output measure (total container throughput per annum) and five inputs, comprising:

- number of terminals— a proxy for terminal-level competition within the port

- number of berths — a proxy for the number of ships a port can service

- total length of berths — a proxy for the size of ships a port can handle

- maximum draft — a proxy for the weight and depth of ships that a port can service

- the number of container cranes (separated into quay, mobile and other cranes to allow for technology differences across ports) (PC 2022b: 62).

Several weaknesses in the PC's approach must be noted. First, the PC's DEA 'assumes that only those inputs specified in the model are used to produce the output' (PC2022b: 58). However, other obvious and important inputs also affect port throughput, such as land (area of the port; road and rail connections etc.) and labour. These other inputs are excluded despite being identified as key variables affecting productivity (PC2022b: 62).

Second, another key assumption is that 'the input and output variables used in the DEA should reflect the actual objectives and process of container port production as accurately as possible' (PC2022b: 61). Thus, the PC explicitly assumes that all 151 ports in the sample have the objective of physical resource minimisation with respect to a given level of output. This assumption is unwarranted: because of the inherent problem of indivisibility in port infrastructure, and forward planning to meet future rising demand, ports regularly maintain a cushion of overcapacity. Moreover, many if not the majority of ports prioritise faster ship turnaround times over physical input optimisation per unit output.

Third, the input variables used in the DEA were selected primarily because of availability and convenience, not because they are inherently important determinants of port efficiency. In other words, they were the only data at hand to do the job. It was only the World Bank/S&P Global Market Intelligence IHS Markit database that offered the very limited number of variables across a large number of ports. Best practices in the selection of both input and output variables would emphasise theoretical and practical importance of selected variables, not ease of data collection. 'The input-output variable selection is usually guided by expert opinion, past experience and economic theory' (Galagedera and Silvapulle 2003: 654). In this case, data was evidently selected primarily on grounds of convenience and availability. The consequence of this approach to variable section is exacerbated in the application of DEA, due to the absence of robustness checks. As Galagedera and Silvapulle stress:

> 'There are no diagnostic checks for model misspecification in DEA that could result due to wrong choices in variable selection. The potential for model misspecification in DEA is therefore high…Model misspecification is of great concern to the practitioner, since DEA efficiency estimates

can be sensitive to the model used' (Galagedera and Silvapulle 2003:
654).

Fourth, DEA outcomes are highly sensitive to the choice of increasing or constant returns to scale in the models used in the FDEA equations. This is certainly the case with the PC analysis, as only 24 ports of the 151 in the sample achieved an efficiency score of 1 under the constant returns to scale model, compared to 87 with the increasing returns or variable returns model. Moreover, there was very little overlap in ports nominated as being on the technical fronter using constant or increasing returns assumptions, implying the models lack internal consistency.

Finally, the PC acknowledges the input variables suffer from multicollinearity, that is, the input or explanatory variables are themselves correlated. This is problematic since it reduces the amount of valid information the DEA can use to calculate relative efficiency of different enterprises (Pedraja-Chaparro et. al. 1999). The PC acknowledges this problem as 'a high degree of correlation between these variables which can introduce bias into the model' (PC 2022b: 62). Specifically, multicollinearity in the PC DEA analysis has the effect of exaggerating the efficiency of ports and these effects can be quite large. For example, when the DEA model is run controlling for some of the multicollinearity by reducing the number of correlated input variables the result is that 'reducing the multicollinearity in the model reduces the technical efficiency scores of most ports' (PC 2022b: 62).

In sum, the PC's DEA analysis which purports to show that the majority of Australian ports are 'technically inefficient' is fundamentally flawed. It does not conform to widely recognised minimum standards of good statistical practice in the selection of the model's inputs and outputs; the results are highly dependent on the choice of constant or rising returns to scale; and it suffers from multicollinearity in input variables which distorts the measure of port efficiency. There are still other problems with the DEA analysis, which are examined below.

Capacity Utilisation and Output Flexibility: The most obvious explanation of the DEA results, and one that is actually suggested by the PC itself, is that the DEA model is not actually measuring 'efficiency in input use,' but simply differences in capacity utilisation across the 151 ports in the sample. In other words, given that the five capital inputs are all 'fixed', and hence cannot be changed in the short to medium term, a higher level of throughput will generate a higher 'technical efficiency score'. The PC (2022: 138) alludes to these problems when it states 'a port's output is not controlled by the port or terminal operators: the number of containers that pass through a port reflects the demand for imports by the local community and world demand for local exports. As such, port throughput is a 'derived' demand'' (PC 2022b:

63). The DEA output variable, annual port container (TEUs) throughput, is based on data for 2019.

The PC conclusion that Australian ports are relatively inefficient in converting inputs into output is unjustified. A more plausible explanation, and one supported by the PC itself, is that the lower 'technical efficiency score' is simply because ship container traffic into and out of Australia was below that planned by the port and terminal operators. Moreover, state governments have encouraged expansion of capital facilities – including by advocating for the addition of third terminals in Sydney, Melbourne, and Brisbane. By its nature 'capital investments in the industry tend to be 'lumpy'', that is subject to high indivisibilities, so that investments in new berths and cranes, etc., is intended to satisfy growing container traffic many years into the future without requiring additional capacity (ACCC 2021: 41).

Indeed, Australian stevedores invested heavily in new plant and equipment to expand capacity massively in the years prior to and including 2019; over the period 2011-12 to 2014-15 annual investment rose 400%-500% above preceding years (ACCC 2021: Figure 4.5). This large growth in investment led to a large expansion in the ports' aggregate tangible asset base. New terminals were added in Sydney, Brisbane, and Melbourne (but not in Adelaide – which, not coincidentally, has the highest 'technical efficiency' of any port in Australia). DP World and Patrick increased capacity of their terminals in Brisbane and Sydney, and invested in technological upgrades following entry of Hutchison. DP World informed the ACCC that, at the time, it invested heavily in semi-automation at its Brisbane terminal, while Patrick informed the ACCC that it also invested in semi-automation at its Port Botany terminal (ACCC 2021:42). NSW Ports (2022), the entity which owns Port Botany and other ports, argues that capacity at Botany is currently such that 'a fourth container terminal is unlikely to be needed until after 2045'.

That the PC should persist with the 'inefficient' port interpretation of its DEA result is truly puzzling since several times it notes the determining effect of capacity utilisation on these results. For example, a '[p]ort's capital investment cycles may affect DEA results. A port may appear inefficient following a capital expansion' (PC 2022b: 64). It expands on this theme by noting several related arguments that undermine its own DEA analysis and the interpretations that flow from it – such as seasonal variations in container traffic:

> 'Australian ports might operate below the frontier and underutilise capacity to prevent port congestion and cope with seasonality in demand (peaks in container volumes and ship arrivals' (PC 2022b: 66).

'One downside to high capital utilisation is that there may be limited capacity to handle any future growth in throughput without further investment' (PC 2022b: 38).

An alternative explanation the PC fails to consider is that ports and terminals are monopolies and oligopolies respectively, and that it is well established that firms in such concentrated markets typically over-invest in capacity as a means of excluding potential new entrants. The implied threat is that existing firms can increase their output to take market share from new entrants at low marginal cost. Supporting evidence for this is the high rate of return achieved by Australian stevedores indicating strong 'market power'. This problem is considered in more detail below.

Far-Fetched Policy Implications: The preceding discussion has demonstrated that the PC's use of the DEA method and data reflects severe technical deficiencies, and the results of its own analysis are open to a completely different and more convincing interpretation. The PC itself advances contradictory interpretations: on the one hand, it insists most Australian ports are 'technically inefficient,' but on the other, it acknowledges that DEA results reflect normal cycles of investment and a desirable level of output flexibility in port operations. Further, the policy implications of the DEA analysis are either absurd or non-existent.

For example, the PC (2022b: 64) suggests that:

> 'Melbourne has an efficiency score of 0.9 – which means that Melbourne should reduce its use of all inputs by 10 per cent to be technically efficient. That implies that Melbourne would need to reduce its use of berth length (2.5 km) by 10 per cent (or 0.25 km).'

Exactly how that would be accomplished is not canvassed by the PC! Meanwhile, the Commission's benchmarking analysis showed that Australian container ports could utilise their physical inputs more intensively (and improve their technical efficiency), but the PC acknowledges that 'data limitations mean the analysis cannot shed light on ways in which productivity might be improved in the short to medium term' (PC 2022b: 69).

Alternatively, ports could benchmark themselves against the practices of what are generally agreed to be high performing ports (PC 2022b:65). This last suggestion has the merit of common sense, and is in fact widely employed by businesses as a means of broadly assessing their comparative performance. However, one does not require faulty DEA results to arrive at this elementary and widely practised business improvement technique.

Finally, once again, the PC faces a fundamental dilemma in resolving its twin and conflicting conceptions of stevedoring efficiency. This results in a contradiction between the two opposing policy implications of its own DEA results. On the one hand, it recommends reducing port inputs to better match port outputs. But on the other hand, it acknowledges that:

> 'Reducing the level of inputs could lead to greater inefficiencies, such as increasing ship turnaround times. This suggests there may be an optimal level of asset utilisation that strikes a balance between technical efficiency and turnaround times (and potentially cost minimisation)' (PC 2022b: 66).

This presumably, is something all port businesses seek to do, consistent with their multiple corporate objectives. It is to a further examination of this dilemma between technical efficiency and ship turnaround times that we now turn in the context of the DEA results.

'Technical Efficiency' vs Faster Ship Turnaround Times: It was noted above that a key assumption for the use of DEA is that 'the input and output variables used in the DEA should reflect the actual objectives and process of container port production as accurately as possible' (PC 2022b: 61). This assumption was shown to be clearly violated, invalidating the DEA results and any consequent policy implications.

It was noted earlier that the PC report is highly ambiguous as to which international productivity benchmark – the DEA technical efficiency rank, or the World Bank (CPPI) ship turnaround time metric – it prefers to use in assessing Australian port performance.

Adelaide is ranked in the top 1 per cent for technical efficiency, but in the bottom 25 per cent in the World Bank study. Conversely, the port of Yokohama, which topped the World Bank rankings, had a technical efficiency score (0.65) – lower than any Australian port. Yokohama had the fastest ship turnaround times as indicated by the CPPI and higher gross crane rates: but it boasts five container terminals, about 5.5 km of berths, and about 40 quay cranes. In comparison, Melbourne and Sydney each have only three terminals, about 2.5 to 3.6 km of berths, and about 20 quay cranes each. Given Yokohama had similar throughput to Melbourne and Sydney, Yokohama's capital utilisation was much lower. This reduced its apparent technical efficiency, but helped achieve faster turnaround times – and might enable Yokohama to better cope with any increase in the volume of containerized trade (PC 2022b: 66).

This ambiguity in choice of metric is critically important as the policy implications flowing from the two competing approaches are diametrically opposed. Accepting

technical efficiency as the core goal implies advocacy for minimising investment to meet a current level of container throughput. Priorising turnaround time, in contrast, suggests much higher investment to minimise turnaround times and allow for future growth in container throughput.

Further analysis of the sample of 151 ports that were used in the DEA model highlights the contradiction in the PC's approach. This analysis reveals that not only is the assumption that port operators should have the sole objective of physical input minimisation wrong, but that the pursuit of this objective leads to worse performance in achieving the much more important objective of reducing ship turnaround time. Table 2 reports a sub-group of the 151 ports, comprised of the 81 ports (in alphabetical order) that received a rank of 1 on the DEA technical frontier (meaning they were the most 'technically efficient'), along with their rank according to the World Bank's (CPPI) metric of ship turnaround times.[6]

Table 2. World Bank CPPI Ship Turnaround Ranking of Technically Efficient DEA Ports

Port on Technical Frontier (per DEA analysis)	World Bank CPPI 2021 Ship Turnaround Times Ranking (out of 370 Ports)	
	Administrative	Statistical
Aarhus	82	67
Abidjan	359	360
Adelaide	264	257
Aguadulce	Np	Np
Algiers	306	305
Aqaba	35	32
Batangas	Np	Np
Bangkok	299	304
Beira	270	268
Beirut	357	356
Bejaia	285	289
Belawan	250	238
Boston	117	115
Cape Town	365	364
Cat Lai	145	132
Chattogram	341	347

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[6] Note that only 73 of those ports were ranked by the World Bank, thus missing 8 of the DEA's 'technically efficient' ports.

Chiwan	17	20
Da Chan Bay	142	122
Dakar	303	308
Damietta	58	56
Dar Es Salaam	361	361
Davao	274	279
Dunkirk	350	345
Fuzhou	Np	Np
Gdansk	203	199
Gothenburg	118	152
Hamad Port	3	4
Iquique	319	311
Itajai	207	145
Itapoa	72	60
Johor	80	79
Koper	Np	Np
Kotka	Np	Np
Lagos (Nigeria)	358	358
Lianyungan	78	73
Limassol	147	172
Lirquen	126	118
Lyttelton	314	312
Manila	327	324
Mariel	222	219
Mawan	44	110
Mersin	34	28
Mundra	48	46
Naha	120	126
Napier	290	282
New Orleans	115	118
Owendo	302	303
Papeete	167	158
Paranagua	198	166
Penang	111	116
Port Everglades	116	102
Port Louis	323	329
Port Reunion	333	331
Posorja	66	65

Prince Rupert	344	339
Puerto Cortes	144	141
Qinzhou	247	244
Rio De Janeiro	93	83
Rio Grande (Brazil)	97	91
Rio Haina	158	155
Salvador	112	130
San Vicente	166	162
Santo Tomas De Castilla	273	275
Sepetiba	123	119
Shekou	6	17
Shuaiba	185	177
Sines	30	35
Southampton	346	348
Suape	280	287
Taichung	125	135
Taipei, Taiwan, China	Np	Np
Tanjung Perak	107	103
Tauranga	325	330
Tokyo	56	51
Tomakomai	239	237
Trieste	326	328
Ulsan	Np	Np
Venice	235	230
Vostochny	Np	Np
Wilhelmshaven	233	204
Yeosu	33	29
AVERAGE	**193**	**192**

Source: Derived from PC (2022b) Figure 24 and Table 12, and World Bank (2022):
Table E1. np- not published as these ports did not appear in the World bank CPPI
index but were used in the PC DEA data.

There were 370 ports ranked by the World Bank CPPI analysis. Each port was ranked
according to two criteria: statistical and administrative. Table 2 includes all ports
ranked 1 on the PC DEA technical efficiency index, with its corresponding score on the
World Bank CPPI. It is immediately obvious there is no correlation between technical
efficiency as measured by the DEA methodology, and real-world ship turnaround time
as measured by the World Bank. Some 'frontier' ports identified in the DEA analysis
perform very well on turnaround, but others rank near the bottom of the World Bank

turnaround ranking. Just 9 of the 73 technically efficient ports are ranked in the top 50 ports in the World Bank CPPI metric. The average ranking of the 73 DEA frontier ports was 193 by the World Bank's administrative ranking, and 192 by its statistical ranking – below the midpoint of the Worlds Bank sample in both cases. In other words, on average the technically efficient ports identified by the DEA performed worse than the median port on ship turnaround.

In the real-world business of global shipping, there is general agreement that ship turnaround times are of paramount commercial importance – more than incremental potential costs savings on port inputs. Small savings on stevedoring charges that are associated with significantly slower access to containers and their contents, is not a recipe for success in this industry:

> 'Port performance is also a key consideration for container shipping lines that operate liner services on fixed schedules, based on fixed port turnaround times. Delays at any of the scheduled ports of call on the route served by the vessel would have to be made good before the vessel arrives at the next port of call in order to avoid an adverse impact on the efficient operations of the service. As such, port efficiency and port turnaround time at all the ports of call are important subjects for operators, and monitoring port performance has become an increasingly important undertaking in the competitive landscape' (World Bank 2022: 14).

2.4.4 Inter and intra-terminal operator variations in gross crane rate

The fourth and final metric of productivity and performance used by the PC is 'variations in gross crane rates for each terminal operator over time, and between terminal operators' at Australian ports (PC 2022: 13). It finds there are indeed 'considerable variations' within and between terminal operators in gross crane rates over time (PC 2022: Figure 8). The PC acknowledges that an explanation for this variation 'requires further consideration', and it is unable to identify definitive causes – but the draft report does take the liberty of suggesting one possible 'candidate':

> 'Reasons for these variations in performance are not clear, but restrictive work practices…that make it less likely that each job in a container terminal is filled by the most appropriate person, are a clear candidate'.

There is no evidence provided for this assertion that inefficient staff assignments are somehow to account for inter-port variation in gross crane efficiency. Yet the PC draws a strong policy implication from its assumption, namely that 'Australian terminal

operators have significant scope to improve ship turnaround times without making any changes to crane intensity.' (PC 2022: 13). This is the basis for its overall conclusion (draft finding 3.4):

> 'There is scope to improve crane rates. Crane rates can vary significantly across terminal operators within the same port and over time within the same terminal operator. More consistent attainment of high crane rates would lift productivity'.

Before proceeding to a discussion of the merits of this argument, it should be noted that this finding apparently permits the PC a way to resolve the dilemma between the conflicting criteria of technical efficiency and ship turnaround times. Simply reforming waterfront work practices offers, in effect, a costless solution (at least from an employer perspective) to increase gross crane rates and therefore reduce ship turnaround times without requiring more capital investment which would lower technical efficiency.

The PC has clearly jumped to two conclusions, influenced by its pre-determined theoretical and ideological biases, not by actual empirical evidence. First, it simply assumes that variation in crane rates is caused by union-influenced work practices. Second, it also assumes (again without evidence) that reforming these practices will raise average crane rates. Alternative plausible explanations to variation in crane rates, and their policy implications, are not considered. Moreover, many of these alternative explanations were actually canvassed by the PC elsewhere in its report, but ignored in this particular argument. Some alternative explanations for the observed variations in gross crane rates, all acknowledged by the PC elsewhere in its report, include the following:

- 'The irregular nature of ship arrivals and variations in call sizes that are outside the control of terminal operators means that achieving high rates of crane utilisation may not always be possible. This observation also applies to other assets such as berths and, on the landside, container yard area' (PC 2022a: 122). Figure 3.3 (PC 2022a) shows that during 2019 (prior to the start of COVID), the monthly reliability of ships arriving on schedule is highly variable, ranging between 75% and 95% on-time arrival.

- 'Seasonal cycles in demand mean maritime system operations and capacity is configured to cope with peaks in volumes. Peak season for container shipping in Australia occurs in September–November as cargo owner inventories are built up prior to Christmas and New Year sales. Low season occurs through January to March and is impacted by Chinese New Year

which sees a fall in the supply of consumer goods due to holiday factory shutdowns' (PC 2022a: 71-72).

- 'Berth windows are managed by the container terminal operators across the week to optimise utilisation of berth space, container cranes and available labour shifts. Allowances are made for variations in volumes and unplanned operational delays. To allow for variability in vessel arriving off-window and volume demands, a target level of berth occupancy of around 65 per cent is desirable (based on the mix of number of berths and competing container terminal operators in Australia's ports). At higher levels of utilisation, container terminals begin to experience congestion and vessels are likely to experience increased waiting times when trying to berth and available labour shifts' (PC 2022a: 83).

- 'Yard congestion can become a major issue for terminal productivity if containers must be continuously shuffled around to access specific units, consuming limited resources that is needed to work ships or trucks' (PC 2022a: 84).

- In addition, variation in ship size, measured in TEUs, can affect crane rates at ports. This is because larger call sizes have faster crane rates (World Bank 2022 Figure 2.7). 'As larger ships typically have larger call sizes, larger ships generally result in lower minutes per container moved (port hours per move) (PC 2022a: 118).

- 'Other factors that affect productivity are also ostensibly outside the control of port and terminal operators (such as the number of ship visits, their arrival times and the number of containers to be handled) (PC 2022a: 138).

Despite these numerous and plausible explanations for inter-port variations in crane rates, the PC leaps to its favoured conclusion that these differences are due to work practices – and without any empirical effort to link crane rate variability to differences in work practices across ports. The PC's assumption that these large fluctuations in gross crane rates (which can swing by 50% to 100% on a month-to-month basis) are due to differences between 'appropriate' and 'inappropriate' rostering of workers is implausible. It implies a phenomenal level of productivity differences between individual workers, which is unrealistic given the technology used in these facilities; moreover, it implies that in certain months a port's staff roster is comprised primarily of cohorts of 'appropriate' workers (allowing strong performance), while in other months 'inappropriate' workers predominate (thus explaining huge month-to-month swings in crane rates). Nowhere does the PC actually specify the characteristics of

'appropriate' or 'inappropriate' worker. Like the great majority of Australian export containers, this category is empty.

Finally, it is worth noting that variation in crane rates in a given terminal or port is not unusual. This is confirmed, for example, by data on the variability of weekly crane rates published by the US Bureau of Transport Statistics (2016).

In sum, it is not legitimate for the PC to acknowledge that it is 'not clear' what causes inter- and intra-port variation in crane rates, but then to advance a strong conclusion that this variation must reflect workplace practices. In fact it is perfectly clear that there are many sound alternative explanations for this variability, that the PC has both acknowledged but failed to apply to its policy conclusions.

3. Industrial Relations and Productivity

Considerable space is devoted by the PC to argue for the adverse effect of port industrial relations and work practices on port productivity. The core arguments it advances are:

- First, structural characteristics of the stevedoring industry shift bargaining power to unions.
- Second, this unequal power results in the inclusion of specific work practices in enterprise bargaining agreements (EBAs) that limit 'managerial prerogative' to deploy labour 'flexibly' constraining productivity.
- Third, unequal power also results in prolonged industrial action that also adversely affects productivity and imposes unacceptable costs, or negative externalities, on users of stevedoring services and consumers.
- Finally, to remove inefficient work practices and remedy the negative externalities caused by industrial disputes, the PC recommends modifying the *Fair Work Act*.

The following section summarises the PC case, and examines the validity of its arguments. It finds these arguments regarding purported union bargaining dominance and the impact of certain work practices on port efficiency are grossly deficient, internally inconsistent, and lack substantive quantitative evidence. The absence of 'hard' evidence about the impact of work practices is freely admitted by the PC, but this does not deter a number of draft findings which presumes that such evidence exists and is highly robust. The PC also fails to consider legitimate reasons why labour might seek to limit managerial prerogative with respect to different forms of labour 'flexibility,' and the adverse effect for worker welfare, safety, and productivity arising from an expansion of such unchallenged prerogative.

Moreover, in making the case that 'negative externalities' generated by these work practices in the stevedoring industry are a basis for government intervention, the PC directly contradicts its own long-standing and trenchantly held position that externality-based arguments require a very high evidentiary base, and encounter substantial risks of 'government failure' in implementing 'second best' solutions. The PC's case for changes to the FWA to offset these supposed negative externalities from stevedoring industrial practices fails to meet its own self-imposed conditions.

3.1 PC ARGUMENTS ABOUT DOMINANT UNION BARGAINING POWER

'On balance, employees hold greater bargaining power over the workplace arrangements in container terminals' (PC 2022a: 257).

Asserting unequal bargaining power is critical to the PC's subsequent argument that restrictive work practices limit productivity and generate negative externalities – the remedy to which requires amendments to the FWA. The power imbalance between employees and employer is attributed to:

- First, ports and container terminals represent a monopoly for exporters and importers since there is no feasible alternative technology for international container shipping. This means that cargo owners 'can face costs if cargos are delayed… Disruptions in ports during protected industrial action, therefore, can add to pressure from cargo owners via shipping lines for operators to conclude negotiations'.

- Second, 'there is fierce competition between container terminal operators for business from shipping lines… The very competitive relationship between container terminal operators provides a strong short-term incentive to make concessions to end an industrial dispute'.

- Third, 'cultural norms, that perpetuate historical workplace arrangements in container terminals, and which reflect power sitting with workers are strong'. There are three additional subsidiary arguments regarding a willingness by 'new entrants to the industry (employers and employees)… to adapt to existing norms than disrupt the culture'; 'high rates of unionisation' and 'the industry also has a long history of industrial action being used as a tactic in workplace negotiations'.

- 'Finally, employees face only a handful of possible employers if they want to work in container terminals. This would normally indicate a potentially monopsonist labour market' (PC 2022a: 255-257).

In conclusion, the PC finds that 'the first three factors indicate that bargaining power tends to sit with employees; the fourth that some bargaining power rests with employers. On balance, employees hold greater bargaining power over the workplace arrangements in container terminals' (PC 2022a: 257).

Unequal bargaining power results firstly, in the insertion of:

'Content in enterprise agreements in container terminals which directly restricts productivity and, when taken as a whole, these agreements are more likely to limit rather than enable productivity growth. The terms in enterprise agreements that are of most concern to the Commission are ones which limit merit-based hiring, promotion and training; strict rules determining the 'order of pick'; limits on the number of casual workers and other workers with flexible rosters; and restrictions on innovation and workplace change' (PC 2022a: 285).

Secondly, unequal bargaining results in an excessive frequency and duration of industrial disputes that adversely affect production and productivity. The combined effect of restrictive work practices and industrial disputes is to impose high negative externalities on port users and consumers (PC 2022a: 265).

Accordingly, the PC recommends amendments to the FWA such as the following: 'Enterprise agreement content that excessively constrains productivity should be prohibited… Protected industrial action causes outsized harm to third parties in the supply chain. FWA mechanisms for suspension and termination of protected industrial action need strengthening' (PC 2022a: 265).

3.2 PROBLEMS WITH THE PC'S ANALYSIS OF INDUSTRIAL RELATIONS

3.2.1 Unequal bargaining power

This section critically assesses each of the arguments asserting excessive union power.

First, there is an internal contradiction in the claim that terminal operators are monopolies and/or oligopolies, yet also lack the bargaining power to resist complaints from exporters and importers regarding delays to container transport. Section 6.3 of the draft report is devoted to the relations between terminal operators and cargo owners and truck and rail transport providers; it finds:

'Neither the transport operators nor the cargo owners can directly shift their business if they are dissatisfied with the cost or quality of service from a container terminal operator. Therefore, at each port, each container terminal operator is a monopolist supplying a service to many transport operators' (PC 2022a: 191).

This is because cargo owners and transport operators contract with shipping lines directly, and/or with freight forwarders who also contract with shipping lines. Terminal

operators have 2-3 year contracts with shipping lines. Other evidence of this monopoly are high terminal access charges imposed by terminal operators on these groups, which the PC recommends be subject to enhanced regulation (Draft recommendation 6.2).

It also follows that uneven bargaining power between terminal operators and cargo owners/transport operators also raises the likely prospect that any rents the terminal operators acquire from workers (should the PC's recommendation to limit union effectiveness be implemented) will be retained by these operators, rather than passed onto these groups or final consumers.

Second, since the PC acknowledges that (depending on port location) terminal operators enjoy a monopolistic or oligopolistic market structure, this calls into question the claim regarding 'fierce competition' between terminal operators to gain contracts from shipping lines. Simple geography is a key factor limiting the degree of price competition shipping lines can exert on terminal operators. The PC acknowledges the 'tyranny of distance' argument, when it notes:

> 'Sydney and Melbourne are the largest markets for international trade…The level of trade means these two ports are 'must call' destinations for intercontinental liner services' (PC 2022a: 77).

In simple terms there is no feasible alternative for the great bulk of container traffic other than to use existing ports and existing terminal operators close to final markets for the container contents. An indication of the high geographic localisation of container traffic is that 99.6% of all NSW container traffic travels through Port Botany (NSW Ports 2022). Further, the type of transactional bargaining, or spot market type pricing, required to elicit 'fierce competition' between terminal operators to service shipping lines, is inconsistent with the fact that 'contracts between shipping lines and container terminal operators run for two to three years' (PC 2022a: 189). Prices between shipping lines and terminal operators are fixed in the medium-term, limiting the type of pressure the PC argues exists to resolve industrial disputes quickly. Finally, there is a clear logical contradiction in the PC suggesting that fierce competition 'provides [employers] a strong short-term incentive to make concessions to end an industrial dispute', while also arguing that a critical problem with waterfront disputes is that they are of excessively long duration. In a similar vein, it is equally arguable that 'fierce competition' between terminal operators would not elicit a 'settle quick' response to industrial disputes by employers but, conversely, any squeeze on profitability would encourage stevedores to 'hold out' against union demands if these demands were as adverse for productivity as suggested by the PC.

The PC's third assertion about *'cultural norms'* is prey to the *petitio principii* fallacy: namely, that an argument's premises assume the truth of the conclusion, instead of contributing to it. A high rate of unionisation in a given industry is equally compatible with labour having a structurally weak bargaining position – including in a monopsonist labour market (which, according to the PC, characterises the stevedoring industry). A high rate of unionisation is a natural response to the existence of any market structure producing unequal exchange. This is acknowledged in the PCs fourth argument, namely that the existence of monopsony implies 'some bargaining power rests with employers'.

There are additional problems with the logic of the PC's argument that 'the bargaining power of a party depends on their capacity to hold out during, or to withdraw from, negotiations' (PC 2022a: 253). This does not imply that only unions have this bargaining strength. By definition, a lengthy industrial dispute involves both parties 'holding out'. Long industrial disputes are more consistent with an equality of bargaining power, or an unstable equilibrium between parties, rather than an imbalance. Second, a further contradiction is encountered in the argument that one factor indicative of 'bargaining power… is the ability for a party to make credible threats to inflict costs on the other party with little cost to themselves' (PC 2022a: 254). This is inconsistent with the other PC assertion that the waterfront is marked by a high incidence and long duration of industrial disputes. The only valid conclusion from these two mutually exclusive propositions is that employers are not cowed by the 'credible threat' of disputes since, by definition, employers do not accede to these threats (given the frequency and duration of disputes).

An additional problem in the PC's logic is that there is no logical connection between the two propositions that unions have excessive bargaining power, and that this results in an excessively long duration of industrial disputes. Prolonged industrial action suggests inadequate power to inflict 'pain' on stevedores. It is self-evidently in the interest of union members to achieve improved wages and conditions as quickly as possible. Delaying receipt of improved earnings implies either bargaining weakness (an inability to achieve one's ends expeditiously and at low cost) and/or that union members apply an irrationally low discount rate to the net present value of enhanced future earnings and conditions. Finally, there is an asymmetry in the argument that 'few participants in this inquiry raised concerns about negotiations around wage increases in container terminal enterprise agreements, with a heavy focus instead on operational terms and conditions' (PC 2022a: 271). The PC must explain why on the one hand unions lack the power to extract excessively high wages to which employers would object, and, on the other, unions do apparently have the power to extract excessively favourable working conditions?

One can only agree with the Productivity Commission's assessment that industrial disputes can impose costs and can have local productivity effects but, equally, that the impact of any particular industrial relations arrangements are in reality a second- or third-order issue in the panoply of the more important factors shaping output and productivity in the stevedoring industry. Previous analysis by the Productivity Commission (2014: 773) on the construction industry is highly germane to stevedoring. It makes the crucial point that:

> 'The use of unconvincing evidence of a large effect [of industrial relations arrangements] may undermine the credibility of proposals for IR policy change. It may also distract policymakers from other factors important for productivity in the construction industry — such as better procurement practices, innovation and diffusion of technologies'.

3.2.2 Reliance on anecdotal evidence

The PC study of industrial relations in marine logistics lacks the very type of 'hard evidence', or rigorous quantitative data, that the PC demands of other advocates seeking changes in public policy. An absence of this type of evidence is noted several times, as is the PC's reliance on qualitative or anecdotal reports:

> 'There is substantial evidence of the effects of workplace relations on productivity. However, it is not the sole driver of changes in productivity, meaning it is difficult to demonstrate any link using only quantitative methods' (PC 2022a: 247).

> 'There are no aggregate data available on labour productivity at Australian ports... This means that it is not possible to clearly identify the factors that have driven better overall productivity, nor what might have prevented productivity growth from being stronger. As discussed above, this is not evidence that workplace arrangements do not affect productivity in Australian ports, simply that showing that link through data is not straight forward. Many inquiry participants have discussed the link, particularly the impact of industrial action on port productivity and the constraints to efficient use of labour in enterprise agreements' (PC 2022a: 259).

> 'Enterprise agreements also contain many terms which of themselves may have a very marginal impact on productivity. However, their cumulative effect is likely to limit the efficient operation of each container terminal and the operation of container ports as a whole' (PC 2022a: 260).

In sum, the PC admits it can marshal no statistically robust evidence that mutually agreed working conditions impose a significant productivity liability on stevedores:

> 'On available evidence, the Commission is not in a position to assess whether the current arrangements appropriately balance flexibility for employers and certainty for employees. What is clear, however, is that these competing objectives have produced elaborate and complex rostering arrangements' (PC 2022a: 275).

Nor is the PC in a position to assert that current arrangements *in*appropriately balance flexibility for employers and certainty for employees. Unfortunately, this lack of evidence is not a restraint on the PC seeking to impose draconian restrictions on the capacity of waterfront workers and their unions to negotiate in the context of a monopsonistic labour market.

Not only is the logic of the PC's arguments regarding unequal bargaining power faulty, but there are also glaring empirical inconsistencies. For example, the claim that the 'content in enterprise agreements… impedes the efficient allocation of labour; and fetters operators in making key business decisions such as the introduction of automation' (PC 2022a: 267) is contradicted by the PC's own draft finding 11.1:

> 'Technology use at Australia's major container ports is in line with international practice. There is no 'best' level of automation and ICT adoption for container terminal productivity and Australia's major container terminals have implemented varying degrees of both automation and ICT adoption, in line with internationally comparable ports'.

3.2.3 Reasons for existence of 'restrictive' work practices

Specific work practices are deemed to constrain managerial prerogative in the disposition of labour and capital, including negotiated limits on:

> 'Merit-based hiring, promotion and training; strict rules determining the 'order of pick'; limits on the number of casual workers and other workers with flexible rosters; and restrictions on innovation and workplace change' (PC 2022a: 285).

The PC fails to reflect on why labour would seek to restrict managerial prerogatives in these and other matters, and also the benefits that might be delivered to both labour and capital by these 'restrictions'. It simply assumes that any rule, freely negotiated or not, that impedes management's unilateral prerogative, must somehow be inefficient. For example, limits on managers' unlimited capacity to hire and fire provides workers

with the job security necessary for them to offset the risk of investing in industry and firm specific skills – leading to a greater willingness to accumulate additional skills. It also provides a countervailing force to employer favouritism and discrimination in hiring, promotion and access to training, thus potentially achieving a better match between job requirements and staff allocations. Demands for higher wages and improved conditions also encourage firms to invest, innovate and seek productivity improvements. The PC accepts the claim from a major terminal operator that 'the sector is not facing labour shortages' (PC 2022a: 276). Nor have 'current skills shortage concerns have been raised by inquiry participants in relation to container terminal operations' (PC 2022a: 376). An absence of labour and skill shortages at a time when the wider economy is suffering both is strong evidence that current wages and conditions perform a critical service in attracting sufficient quantity and quality of labour to the stevedoring industry.

The PC also appears to accept that Australian ports are relatively safe:

> 'The Maritime Union of Australia (sub. 59, pp. 104–5) stated that there has not been a stevedoring fatality on Australian ports since May 2014, nor have inquiry participants raised concerns about serious injuries or accidents in Australian ports… The guidelines and regulations that ensure the safety of Australian workers should not be compromised for speed' (PC 2022a: 115).

Safety is the outcome of a complex set of interacting factors – such as technology, training, government regulation and custom and practice at work. The PC is recommending significant changes to industrial relations bargaining with the explicit intention of shifting the balance of power in favour of employers, without undertaking due diligence as to the possible effect of these changes on worker safety. This reflects a somewhat cavalier attitude by the PC to worker safety.

Finally, the PC completely fails to acknowledge the substantial international research on the importance of labour being afforded a level of autonomy and control at work, not just for mental well-being but also for productivity. For example, the Committee for Economic Development of Australia (CEDA) in a recently released report found that:

> 'High level of work demands combined with low levels of autonomy causes negative mental health outcomes in the workplace… Employment characteristics have also been shown to have significant impacts on mental health including working hours, modes of employment and relationships with colleagues. Insecure employment

and temporary contracts are associated with worse mental health outcomes for employees' (CEDA 2022: 22).

Those job characteristics associated with harm to workers such as insecure work; absence of objective and non-discretionary criteria for job promotion and career paths (like time served); reduced capacity to have a say in the time, place and content of work; and reduced right to be consulted about new technologies, are keenly advocated by the PC. Despite this evidence, the PC forges ahead with strong recommendations, not informed by empirical evidence, to amend the FWA in ways that would significantly extend managerial prerogative and conversely reduce the quality of working life, namely:

'to prohibit excessive constraints on:

• merit-based hiring, promotion and training;

• the number of casual workers and other workers with flexible rosters;

• who employers can choose to backfill positions; and

• innovation and workplace change' (PC 2022a: 28).

3.4 EXTERNALITIES

3.4.1 Problems with the PC Case for Negative Externalities

Following on its analysis of industrial disputes and work practices, a key finding of the PC is that:

'Protected industrial action causes outsized harm to third parties in the supply chain. FWA mechanisms for suspension and termination of protected industrial action need strengthening.
- When determining whether to suspend or terminate industrial action on the grounds of significant harm, the Fair Work Commission should interpret the word 'significant' as 'important or of consequence'.
- The range of third parties who can make applications to suspend or terminate protected industrial action in the ports should be widened to include entities with an interest but who may find it difficult to show they are directly affected, such as employer and employee associations or third parties like importers/exporters' (PC 2022a: 265).

The significance of the first dot point is that the PC is seeking an extension to the current FWA provision allowing intervention in cases in which a dispute 'is causing (or threatens to cause) significant damage to the Australian economy or a part of it' (PC 2022a: 297). By 'third parties' the PC means '*all* Australians…including consumers, the unemployed and employees and employers that are directly and indirectly affected' (PC 2022a: 247). This recommendation is based on the economic notion of a 'negative externality', or uncompensated harm caused by one economic agent to another agent, to justify further restrictions on industrial disputes and work practices.

The authors of this report appear to be oblivious to the fact that over many years the PC as an institution has reflected deeply on the concept of externalities, and formed a consistent, well-argued and adamantine position on how externalities should (and should not) be considered in policy development. These authors would benefit from reviewing the strong statements of previous Productivity Commission Chairs and Commissioners on this matter. In essence, the claim that negative externalities from maritime industrial relations practices are significant and warrant substantial government intervention contradicts the long-held PC stance that such demands should be treated with extreme caution and be subject to a very high evidentiary barrier. For example, the PC (2008: 18) warns government policy makers of:

> '…the scope to significantly overstate the externality rationale. Indeed, in the extreme, externalities can provide a conceptually appealing catchcry to justify the introduction or continuation of virtually any government intervention'.

A failure to have regard to extensive precedence would reflect a degree of intellectual incoherence for the PC as an institution, and invites the suggestion there is an element of opportunism in the selection of economic arguments to justify recommendations. Over many years the PC has advanced several arguments against the notion of negative externalities as a basis for public policy, some of which include:

A pragmatic attitude to markets/government intervention is not costless

> 'Market failure is often given as the reason for government intervention…However, examples of significant 'failure' are few and far between. While markets rarely allocate resources 'perfectly', in time, they will usually deliver reasonable outcomes for most market participants. Moreover, even when there is potential for governments to improve on market outcomes, often they do not have the necessary information to do so…And government intervention is not costless. Apart from administrative and compliance costs, raising the revenue

needed to pay for programs can have significant efficiency costs' (PC 2008: 16).

Similarly, then-Chair of the Commission Gary Banks (2008: 12) opined '[m]arket failures are pervasive, but in order for them to become a rationale for intervention ('policy relevant') they need to be substantial and amenable to government action, without giving rise to even larger costs'. Determining whether externalities are amenable to intervention and the cost and benefits of intervention requires considerable information and is computationally intensive.

Unquantified harms and uncertain benefits

> 'Protected industrial action causes outsized harm to third parties in the supply chain' (PC 2022a: 265).

In response, draft recommendation 9.7 proposes to 'allow a broader range of third parties to apply to terminate protected industrial action occurring in the ports.' But earlier the PC (2008: 25) warned that any proposal to intervene to redress a negative externality must first undergo a:

> '…proper assessment…[and] take account of such things as: the nature and magnitude of the problem being addressed; the impacts of alternative policies to deal with the problem; and the impact of not doing anything… Obtaining relevant information can be costly, or even impossible. This increases the probability that intervention will be inappropriate'.

The PC should heed its own advice, as it notes 'quantifying the effects of enterprise agreements on workplace performance is challenging' (PC 2022a: 270). So challenging indeed that the PC does not actually venture a cost figure. A much more difficult, in fact, impossible, task is to quantify the scale of harms to third parties against which must be set loss of income, amenity and quality of working life caused by the proposed changes to the FWA. Any general equilibrium analysis of the proposed change must include a full accounting of all gains and losses.

Government intervention impedes market adjustment to externalities

If the harms caused to third parties by periodic industrial disputes and work practices were as significant as claimed by the authors of the maritime logistics report, an obvious market response would be some form of 'risk pooling' by injured parties, such as insurance, to offset the risk. The fact that they have not, or not extensively sought to cover such risks, suggests the harms do not justify such action. The PC examined risk pooling in the context of large 'risky' investment projects, such as those subject to high

indivisibilities, but its conclusions are equally applicable to the current matter. It concludes that:

> 'Risks are not good reasons for government intervention…And the financial markets offer a range of devices to allow firms to pool risk… Hence, for governments to contemplate intervention, there must be impediments to efficient risk pooling' (PC (2008: 20).

Moreover, government intervention could prevent a more efficient market evolution by impeding future development of these markets.

Danger of 'second best' government interventions

A case is often made for government intervention to compensate for the adverse effects on industries of other government policies (PC 2008: 21). This is often referred to as the 'second best' solution to market failure. It is relevant in cases where the first best solution requires, for example, the introduction of greater competition in a given market to foster a more efficient allocation of resources. With the negative externality argument, the PC (2022a) is making a case for second-best intervention to redress the 'harms' purportedly caused by the current FWA and competition laws which permit concentrated product and labour markets in the maritime industry. A preferable first best solution would be to directly address the highly concentrated structure in the maritime industry: something the PC appears only willing to do at the margin.

Gary Banks (2008: 16) highlighted 'the problem of designing effective policies on second-best grounds that would be effective.' Similarly, a doyen of the economics profession, Professor Harry Johnson, once put it this way:

> 'The fundamental problem is that, as with all second-best arguments, determination of the conditions under which second-best policy actually leads to an improvement of social welfare requires detailed theoretical and empirical investigation by a first-best economist. Unfortunately, policy is generally formulated by fourth-best economists and administered by third-best economists; it is therefore very unlikely that a second-best welfare optimum will result from policies based on second-best arguments'.

Conclusion

This paper has provided a detailed and critical review of the Productivity Commission's draft report on productivity in Australia's container port industry. This report was commissioned by a previous federal government, which at the time was intent on prosecuting a general argument that unions are too powerful, and exert a nefarious influence on labour markets, economic activity, and productivity. Unfortunately, these ideological motivations for the report find reflection in the draft report's knee-jerk assertions about the role of work rules, staffing practices, and industrial disputes in purportedly undermining productivity and efficiency in Australian ports.

In fact, the PC's own data (as well as that from other sources, such as the World Bank) indicate that Australian ports are indeed comparable on practical efficiency grounds (as opposed to theoretical and abstract measures) to those in other countries. The PC's blanket assertion, unsupported by evidence, that certain outcomes (such as variability in crane rates between different ports and different times) must somehow be due to inappropriate staffing practices, reveals the ideological predisposition of the whole exercise. The draft report leaps to a conclusion that far-reaching changes to industrial relations law, with potentially severe consequences for the collective bargaining rights of workers in this and other Australian industries, are needed to prevent supposed 'externalities' that are not credibly described or quantified, contradicts the PC's own long-standing reluctance to invoke such indirect arguments as a rationale for more government intervention in the economy.

The rights of workers to form unions, negotiate collectively, and take industrial action have a long pedigree, are enshrined in national and international commitments, and have important and valid motivations: namely, to give workers the capacity to offset the concentrated economic power of employers to set wages, working conditions, and work practices. The capacity to negotiate collectively is all the more important when a few employers dominate sectoral labour markets – as the PC itself confirms is the case in the stevedoring industry. The numerous theoretical and methodological flaws in the PC's analysis, and its extreme and unjustified conclusions regarding far-reaching changes to constrain industrial rights in this industry, are not supported by empirical evidence, and were likely influenced by the ideological predispositions of the Commission itself and the government which commissioned this report. The current Commonwealth government should reject the recommendations contained in the PC's draft report regarding changes to the **Fair Work Act** and other restrictions on industrial practices in maritime logistics, and instead work with all stakeholders in the industry to

implement positive and mutually beneficial improvements in the sector's infrastructure, technology, and skills and training systems to ensure that our national maritime logistics capacity meets Australia's needs as a trading nation.

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