The effects of innovation in regulation outside the direct employment relationship in road transport

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Abbreviations

ABN	Australian Business Number
ABS	Australian Bureau of Statistics
ANTT	Agency for Land Transport (Brazil)
ATO	Australian Tax Office
BITRE	Bureau of Infrastructure and Transport Research Economics
CSDDD	Corporate Sustainability Due Diligence Directive (EU)
ELD	Electronic log device
EU	European Union
FMCSA	Federal Motor Carrier Safety Administration (USA)
FNV	Federatie Nederlandse Vakbeweging (Federation of Dutch Trade Unions)
FWC	Fair Work Commission
GAO	General Accounting Office (US) — renamed the Government Accountability Office in 2004
GUF	Global Union Federation
IBT	International Brotherhood of the Teamsters
IR	industrial relations
IRC	Industrial Relations Commission (NSW)
LAANE	Los Angeles Alliance for a New Economy
LFS	Labour Force Survey (ABS)
MFF	Minimum Freight Floors system (Brazil)
MoLIT	Ministry of Land, Infrastructure and Transport (Korea)

NSW	New South Wales
OBCCTC	Office of the British Columbia Container Trucking Commissioner
PBLIS	Port Botany Landside Improvement Strategy
ROA	Rest of Australia (i.e. excluding NSW)
ROI	return on investment
RT	Road (freight) transport
RTR	Road (freight) transport reform

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Executive summary

Overview of the sector (chapter 1)

The road transport (RT) industry is characterised by extensive contract networks, featuring hierarchical contractual chains with drivers at the bottom, often without employee status, but with the debts associated with ownership of large trucks. We refer to the firms at the top of contractual chains as the 'apex firms' so, in the road transport sector, the apex firms are the 'beneficial freight owners' or, more simply, 'freight owners'.

The industry features: long working hours, low incomes, high debt, insolvencies, and a poor safety record, while drivers experience difficult working conditions, time pressures, loneliness, depression, musculo-skeletal disorders, fatigue, obesity, diabetes and cardiovascular issues and the threat of injury or death.

More detailed sectoral data (chapter 2)

There is an underlying trend for the share of truck driving undertaken by owner-drivers and/or contractors to increase — in stark contrast to trends across the rest of the economy. The road freight transport industry is one of the lowest-profit segments in the economy. Other industries, to which road transport provides services, almost all experience higher profits than does road freight transport itself. Many firms in road freight transport are contracted to provide services to other firms higher up the contractual chain in the same industry. The road freight transport sector in NSW appears to have a smaller role for owner-drivers and/or driver contractors than does the rest of Australia, though they remain significant.

Innovation and Regulation in Australia and Internationally (chapter 3)

While the employed component in the sector is often regulated, the contractor segment, near the bottom of the contractual chain, is mostly unregulated except in New South Wales, where chapter 6 of the *Industrial Relations Act 1998* enables the Industrial Commission of NSW to regulate payments for intra-state journeys and facilitate bargaining between industrial parties. This legislation has survived several changes of government. It has led to a substantial long-term reduction in road deaths (it was estimated as leading to more than 200 lives saved).

At the federal level, the Road Safety Remuneration Tribunal was legislated into and out of existence before its effects could be properly or even tentatively assessed. However, unpredictable annual variations in road deaths make short-term evaluations of legislative change near impossible anyway.

Most recently, the *Fair Work Legislation Amendment (Closing Loopholes No. 2) Act 2024* (Cth) (Closing Loopholes) has given the Fair Work Commission similar powers to deal with remuneration in the industry as its NSW equivalent enjoyed, plus new ones to deal with contractual chain issues.

International examples of attempts to regulate outside the employment relationship in this industry — in Korea (now lapsed), Canada, Brazil, the United States and Europe show both similarities and differences with the approaches taken to handle the problem of road freight transport in Australia and each other. Australia's Closing Loopholes approach is overall the most advanced legislation internationally in dealing innovatively with remuneration and hence safety and efficiency in the road freight transport sector. Overall, the international experiences point to a number of lessons, including the desirability of:

- enabling bargaining or regulation outside the employment relationship, including on matters concerning remuneration of drivers, but also ensuring that workers who are genuinely employees are treated at law as if they are employees;
- enabling the relevant agency to take account of the need for drivers to earn a reasonable income, and not just recover their costs;
- encouraging the minimum standards for employees and contractors to be broadly equivalent in value, not giving preference to one business model over the other;
- having the capacity to regulate the contractual chain as a whole, in particular the role of freight owners, and not just the firms that directly engage drivers, enabling the freight owners to be held accountable for what happens in the contractual chain;
- permitting regulation to cover all participants in an industry in a jurisdiction, not just those who operate within a limited geographic area within that jurisdiction;
- recognising and giving legal force to agreements between unions and contractual chain participants, including freight owners;
- focusing on arrangements that have long-term sustainability and certainty, through entrenching a high level of consultation and avoiding sunset clauses;
- enabling indirect regulation of dwell time and other factors that may be influenced by the behaviour of freight owners.

Can we quantify the effects of regulation? (chapter 4)

It is not a simple task to precisely estimate the full benefits from application of the Closing Loopholes principles to road transport regulation in Australia. The total or social effects of any transaction or a regulation can be broken down into private effects and public effects. The private effects are those that apply only to the parties. Public effects are also referred to as 'externalities' — costs or benefits that are borne not by the parties to a transaction but by others in society. Some of these effects are unquantified.

In the end, to the question 'Can we quantify different types of effects of road transport regulation outside the employment relationship?', we must answer 'only partially'. This is not to say that the nature of the effects of public policy here are unknown. We know that there are health and safety gains from higher labour incomes, and these gains are shared between the firm, the driver and society at large, though in what shares is harder to quantify. The rest of the report looks in more depth at the evidence. One effect that is apparent, though, is that any inflation consequences of a future rise in income in road transport are likely to have a very small impact on the price level. To the extent that higher remuneration does put any upward pressure on freight prices, the latter would seem to be inefficiently low to begin with.

The economics of pay, safety and health (chapters 5 to 7)

It is important for safety and economic efficiency to explicitly pay truck drivers for their non-driving service to the employer. Theoretical and empirical economic research on compensation and productivity shows that:

- narrowly defined incentives can have unintended consequences;
- higher wages are associated with greater productivity, while lower pay is associated with lower productivity;
- 'shirking' is reduced by higher wages and less wasting of workers time by such factors as commuting time, unpaid working time loading, unloading, waiting in queue, waiting for a work assignment, and mechanical service and breakdown;
- paying higher wages allows companies to acquire better candidates who will have longer tenure with the firm;
- workers have a sense of fairness about their and they are likely to leave if they perceive their own wages are low relative to comparable peers;
- when workers believe they are being compensated 'generously', or even 'fairly', this may induce extra effort to justify the perceived 'extra compensation' they are receiving, thereby affecting effort and productivity;
- an unregulated labour market, without wage floors, can lead to the 'race to the bottom', with high quality labour leaving a labour market for better offers elsewhere;
- low road employment practices (such as high use of temporary staff) are negatively correlated with corporate performance, innovation and job satisfaction;
- hourly labour productivity declines as working hours increase into higher ranges;
- morbidity increases as wages, job security and job quality fall;
- jobs with a higher level of physical labour and exertion lead to poor health outcomes;
- performance-based pay schemes can lead to overexertion, excessive working hours, exhaustion and stress, and encourage behaviour that increases the probabilities of crashes, injuries, and fatalities;
- especially in cases where there are negative externalities and monopsony power, under-pricing of labour will lead to inefficiencies, below-par social welfare and workplace disamenities which lead to 'labour shortages'.

Three related studies specifically on road freight transport show links between economic incentives and safety and performance outcomes. One indicated that drivers' 'target earnings' require an undesirably high number of hours. A second study suggested that, on average, for every 10% increase in driver compensation, there are approximately 9% fewer crashes, holding all other factors constant. A third found that higher driver pay and tenure are associated with better safety performance. Studies using firm-level operational and financial data have separately demonstrated that trucking companies on sound financial footing were significantly safer than firms operating on thin margins.

Other studies specifically in road freight transport found that intense competition and the externalization of safety costs creates a 'race for the bottom' with a proliferation of precarious work arrangements, and likely lower productivity in the long run. Costs are borne both by owner drivers and freight owners as well as other road users. Sustainable pay would attract better drivers, discourage longer work hours, and reduce economic pressure. Establishing a chain of responsibility would reduce the incidence of morbidities, and the burden on the healthcare system. Under-pricing of labour in road transport can lead to pollution, excessive carbon emissions, congestion, higher crash risks for professional drivers, non-involved drivers and passengers, and other externalities.

Further research possibilities (Chapter 8)

The most productive approach in the short term to filling the gaps in our knowledge, we believe, would be to undertake an intra-firm and inter-firm study showing the actual impact of road transport reform (RTR), with attention to the situation in NSW vs the rest of Australia. That would address the effects of the data deficiencies by constructing a picture of the total effect of RTR in an Australian context. It could consider such matters as the use of employees vs contractors/owner drivers, terms and conditions, delivery time, driver reliability, safety indicators, driver turnover, pay, job security, tenure, intention to leave, costs and productivity.

Further longitudinal research could subsequently investigate the internal effects of minimum sustainable rates. Other research could study the external effects of minimum sustainable rates, with a focus on analysis of crash cost savings, alongside analysis of health effects, dead weight losses and social benefit.

Conclusion and recommendations (chapter 9)

Overall, this report shows that regulation outside the employment relationship can lead to increased productivity, reduced other costs (e.g. of recruitment), improved recruitment and retention (resolution of the "driver shortage" problem in road transport) and improved safety in road transport. Price increases are likely to be minimised (though we do not know by how much) due to increased productivity and reduced costs. The impact on inflation is likely to be very small. The social benefits of safe rates reduce or more than offset price effects. This report **recommends** that:

I The procedures outlined under Part 16 of the Closing Loopholes Act No 2 be activated to enable the establishment of:

- minimum rates of payment for trips by owner-drivers and contractor drivers of trucks so that the net incomes to drivers, after costs are accounted, for become equivalent for all types of drivers, regardless of whether they are employees, owner-drivers or contractors;

- minimum rates of payment for trips by owner-drivers and contractor drivers of trucks, sufficient to minimise the incentives for risky behaviour that endangers drivers and other road users; and

- other mechanisms — to ensure worker input, support collective bargaining by contractors and owner-drivers, manage grievance resolution, and underpin effective enforcement and compliance — that maximise the effectiveness of the reforms to prevent the re-emergence of 'loopholes'.

II Organisations representing contractor firms and individuals, employers, employees, owner-drivers, beneficial freight owners, government and other industry participants continue the process embodied in the industry roundtable in Parliament House in August 2022, and other agreements between industry parties, and support the above actions due to the favourable impacts on:

- road safety;

- economic efficiency;

- efficient resource allocation; and

- health and wellbeing of drivers.

III Further research be undertaken into the areas identified in this report where knowledge is presently inadequate, including through:

- a comparative study assessing the impact of a known policy intervention (Chapter 6 regulation in NSW);

- collection of cross-sectional and longitudinal data that document and link hours of work, remuneration method and level, trucking firm safety performance, trucking firm economic performance, and driver safety and health.

1. Introduction to the sector

1.1. Introduction

1. In August 2022, major participants in the Australian road transport industry gathered in Parliament House, Canberra, to discuss reform of the sector. They lamented that:

> there are unique challenges facing various parts of the sector, from road safety risks that can have deadly consequences for workers to competitive pressures that can force transport operators to operate at below cost recovery which has resulted in one of the highest rates of insolvency of any industry (Road Transport Roundtable, 2022).

2. The transport companies, union, industry bodies, gig firms and client corporations that made up this group were searching for innovative policy solutions to the problems facing the industry, not least because 'the legal framework has not kept pace with changes in the industry including the rise of the on-demand economy and new types of work arrangements' affecting an industry they saw as being 'vital for both Australia's economic future and the safety of all Australian road users' (ibid). It was clear that part of the solution would lie in new approaches to regulation, including in regulation outside the conventional direct employment relationship.

3. This report investigates the issues in this innovative approach to regulation. It commences by providing an introduction to the industry, including an overview of its structure and features, and the relevant legislative actions in Australia at the state and national levels. The following chapter shows the international context in which action in Australia is taking place. Even though, in many ways, legislative actions are leading the world, this is not to suggest that there have been no developments attempting to deal with the issues in other jurisdictions. Australia's, however, has perhaps the greatest prospects for success.

4. The next chapter presents more detailed sectoral data. After that, we investigate the regulatory environment and developments in Australia and overseas. Then we consider the different types of effects that road transport regulation outside the relationship can have, including private effects (that affect the direct parties to the relationship between driver and client) and public effects (that affect broader society). We investigate the data considerations that are relevant in investigating the price effects of such regulation and discover that some of the data that would be required for full estimation simply do not exist in Australia. Nonetheless, some important data about the sector are uncovered.

5. The subsequent three chapters investigate the existing literature and theory that would underpin the logic of policy action in this area. They cover: the economic theory

of pay, safety and health; private effects on efficiency, productivity and cost savings (for road transport providers and freight owners or apex firms) from the regulation of compensation; and the social effects of regulation.

6. The eighth chapter outlines an agenda for research to fill the gaps and definitively address the remaining unanswered questions. The final chapter has a conclusion that tells us what we already know, and what we do not yet know, about regulation and compensation in road transport. There is also an appendix containing matters of lesser significance but still relevant to the text, and a bibliography.

1.2. Structure of the industry

7. The road (freight) transport (RT) industry in Australia (and many other countries) is characterised by extensive contract networks. These are complex inter-firm relationships or business structures that can permit the avoidance of a work provider's obligations under employment law obligations (Johnstone et al., 2012, p. 66) A supply chain is one type of contract network. The RT industry, like many others, has exhibited a form of what can be called 'not-there employment' — whereby large firms (the 'core' capital in an industry) avoid employment responsibilities by contracting out work to individuals, franchises or sub-contracting firms (Peetz, 2019). Thus, the firms at the top of a supply chain (in this report, we mostly refer to them as 'contractual chains', which is also the language mostly used in the Fair Work Act) are able to minimise costs and minimise their accountability while maintaining control and maximising profitability.

8. In this report, we use the term 'apex firms' to refer to these firms at the top or apex of supply or contractual chains. In the RT sector, we refer to the apex firms as 'beneficial freight owners' or, more simply, 'freight owners'. Terminology differs among countries, and other terms that have been used to describe apex firms in the RT sector include 'cargo owners' or 'beneficial cargo owners' (especially in the USA, but also in many other places), 'shippers', 'top tier contractors' or even 'economic employers' (the firms with economic control, as an employer has over an employee).

9. In the Australian RT sector, the freight owners — major wholesale, retail and logistics firms — use owner-drivers (independent contractors who own their own trucks), contractor drivers (who drive but do not own the trucks, something not legal in the USA, for example) and/or employees of both core capital and peripheral firms (contract distribution firms) to transport goods. In the 1970s, in order to minimize costs, corporations in the trucking industry began to switch from using employees to owner-drivers. As we shall see later (section 2.2), there is evidence that the role of 'not-there employment' in the sector has recently been increasing, through the relative growth of non-employee work.

10. In the Australian RT industry, one example of a contract network is the conventional, hierarchical supply chain in the supermarket sector. Within these structures, truck drivers are at the bottom of the hierarchy, performing delivery work.

Delivery is allocated by retailers to principal contractors (RT companies). These RT companies then hire the RT workers to perform the work. Alternatively, they can give out the work to a further layer (or layers) of RT industry employers who then engage their own workers (Johnstone et al., 2012, p. 69). The retailer can control the schedule and maximum price of the delivery services through its contract with the firm in the next layer down. As a consequence of the hierarchy of contract, retailers avoid direct legal obligations to RT workers, yet they retain control over the framework for how work is performed, consistent with the principles of 'not-there' employment.

11. Three other types of contract networks in the RT sector involve digital platforms. An example is business relationships between workers and digital labour platforms or 'gig' companies — platforms through which RT workers (usually in light vehicles or even motorcycles or bicycles) are engaged or arrange to perform *grocery or food delivery* work as contractors.

12. A second example is where digital labour platforms (such as Amazon Flex) are used to engage RT workers to perform *last-mile parcel delivery* work. The use of this mode, at the lighter end of the sector is, in fact, a growing trend in the RT freight sector.

13. A third example involves the transport of *heavy freight* through 'gig' arrangements. The digital labour platforms in this instance are organisations such as Ofload and Loadshift. Through these contract networks, gig firms have expanded into the broader Australian trucking industry.

14. This phenomenon has not been restricted to Australia. The trucking industry in many other countries is also characterized by a predominance of small trucking companies and contractors, many of whom can be considered to be misclassified employees. In the United States, for example, this process began in the early 1970s after Federal District courts declared that "owner-operators" (defined then as truck drivers who owned their own trucks) were not employees for the purposes of union representation. Still, in the late 1970s, unions (primarily the International Brotherhood of Teamsters) represented between 60% and 70% of all truck drivers and dock workers. After passage of the Motor Carrier Act of 1980, initiating economic deregulation for interstate trucking, and the Federal Aviation Administration Authorization Act of 1994 (FAAAA), which mandated intrastate trucking deregulation, union density among employee truck drivers declined to 10.9%. While the US government generally collects no data on owner-drivers (whether independent or dependent), the latest national survey, conducted in 2007, indicates that more than one third of the workforce fell outside the employment relationship (making them ineligible for union representation) and this proportion has grown significantly since then. This means that about 6% of the intercity truck driver workforce had union representation in 2024, including the trucking industry as well as 'courier and messenger', the industry classification that includes United Parcel Service and Federal Express (Belzer, 2024 forthcoming).

15. While the structure of the industry is broadly similar across Australia, there is a difference between the largest state, New South Wales (NSW), and the other states comprising the rest of Australia (ROA), due to different institutional arrangements. In

NSW, the inclusion of what is now Chapter 6 of that state's Industrial Relations Act affects contract networks because it provides for regulation of minimum payments and other aspects of work in the non-employee sector of intra-state transport. This is described in more detail in section 3.2. Thus, in NSW, a smaller proportion of road transport businesses are sole-operator owner drivers (paragraph 61 below). While data availability minimises the scope for many comparisons between NSW and ROA, the penultimate chapter of this report will suggest this comparison as an important dimension of future research. There are other differences between states (for example, RT in the Northern Territory has more reliance on 'outback' roads than RT in Victoria), but these are not explored or considered in this report.

1.3. Issues in the industry

16. Truck driving is one of the most common occupations for Australian men, employing roughly 3% of the national male labour force. Road transport is also the modal source of domestic freight transport, with over 75% of non-bulk domestic freight carried in long distance trucks ('over the road' in US terminology). Freight demand is predicted to continue to increase (Xia, Iles, Newnam, & Collie, 2018).

17. As mentioned, the 'not-there employment' model is used in the RT sector because of advantages in terms of cost, accountability and profits while attempting to maintain managerial control. The extent of the financial advantage here is not often quantified. However, the rising use of Amazon Flex's digital labour platform for 'last mile' goods delivery (mentioned in paragraph 12) is associated with an estimated 30% reduction in the price of deliveries (Cosgrove, 2019), suggesting that this model has major cost advantages that may be, in large part, at the expense of the driver.

(a) Resultant problems

18. The consequences of changes in employment regimes have included: poor driver safety, including a high occupational fatality rate (Safe Work Australia, 2021b); long working hours and low wages amongst employees (Australian Bureau of Statistics, 2019); incentives to drive fast, skip breaks and engage in other risk-taking behaviours; and low incomes, high debt and insolvencies amongst owner-drivers. The road transport industry has one of the highest rates of business insolvency (ASIC, 2019), with more than 300 transport companies filing for bankruptcy in a year (ASIC, 2019).

19. Road transport is one of the most dangerous occupations in Australia. From 2003 to 2012, almost a third of all worker fatalities in Australia resulted from truck-related incidents. The majority of these fatalities, around 75%, occurred on the road (J. R. D. Edwards, Davey, & Armstrong, 2014).

20. Long-distance truck drivers are exposed to multiple risk factors at work, including long hours, isolation, intense time pressure, sedentary work, and poor access to healthy food. As a result, truck drivers struggle with loneliness, depression, musculo-skeletal disorders, fatigue, obesity, diabetes, cardiovascular disease, and cancer

(Apostolopoulos, Soenmez, Shattell, & Belzer, 2010; Birdsey et al., 2015; Chau et al., 2013; Monash Insurance Work and Health Group, 2020; Sieber et al., 2014)

21. The RT industry seems to be under constant pressure from severe driver shortages, or, more precisely, an inability to recruit and retain qualified truck drivers under prevailing labour market conditions. These developed in response to economic deregulation and to deregulation of the labour market through the prevalence of contractors. Work conditions, the overall image of the industry, and, in particular, insufficient pay for the tasks undertaken are commonly cited as barriers to recruitment (Kazalac, Ramsay, & Morris, 2008; Morris & Kazalac, 2009; Xia et al., 2018). In Australia, there are indications of labour shortages. The Australian Government's Skills Priority List, produced now by Jobs and Skills Australia, listed 'truck drivers (general)' as an occupation in 'shortage' nationally, and in each state, in 2023. The same ratings were given the occupation in 2022, whereas in 2021 it was only in the Northern Territory and Tasmania that it was categorised as being in shortage (Jobs and Skills Australia, 2023).

(b) Health and road safety in the sector

The Australian Road Transport industry faces major safety problems. In 2023, more than 200 people were killed in truck-related crashes, including 54 truck drivers.[1] Transport workers are 13 times more likely than other workers to be killed at work (Safe Work Australia, 2021a). In the 5 years between 2017 and 2022, 983 Australians lost their lives in crashes involving either a heavy or light commercial vehicle (Department of Infrastructure Transport Regional Development Communications and the Arts, 2021). The fatal crash rate per million vehicle kilometres travelled for articulated trucks is three times that for passenger cars, notwithstanding that the former are controlled by professional drivers and the latter, typically, are not (Bureau of Infrastructure Transport and Regional Economics, 2016).[2]

22. Death and injury carry substantial human costs. In addition, there are significant economic and flow on social costs. Heavy vehicles crashes alone account for $ 1.5 billion each year (Department of Infrastructure Transport Regional Development and Communications, 2022, p. 5). This figure does not include the costs associated with other commercial vehicle crashes. This does not include the suffering experienced by families and communities affected by road injuries and deaths.

23. Low incomes for owner-drivers (Quinlan, 2001) have contributed to the heavy vehicle road transport industry having the longest working hours and the most deaths —

[1] Another 4 transport gig workers died that year. Truck-related fatalities are monitored and collated by the Transport Workers Union (TWU) based on media reporting of truck crashes. Data here come from https://www.twu.com.au/press/transport-industry-remembers-235-killed-in-2023/.

[2] Not included in these statistics are gig transport workers whose deaths in the road transport industry have not been identified or recorded as work-related fatalities. Personal injury among gig transport workers is endemic but hidden by the lack of workplace reporting, with a third of food delivery workers in one survey reporting being seriously hurt or injured at work (TWU, 2021).

especially among bystanders — of any industry (Quinlan, 2016). Long hours in the industry are linked to poor general health, severe psychological distress and near-misses (Monash Insurance Work and Health Group, 2020). Over the period 2016–20, the road transport industry had the highest fatality rate per 100,000 workers of any Australian industry — higher even than agriculture, construction or mining (Safe Work Australia, 2021b). Safety problems have become evident in other aspects of road transport now relevant to contractor employment. In Sydney, for example, five independent courier riders died at work within three months in 2020 (Palu, 2020). A further two died in Melbourne within two months in late 2020 (Bonyhady, 2021). One study found that 73% of food delivery workers feared being seriously hurt or killed every time they started work (TWU, 2020).

(c) The human impact on road transport drivers

24. Some experiences of road transport drivers in regimes without safe rates were disclosed in evidence to the Senate Inquiry into the Closing Loopholes Bill in October 2023. One, Robert Ireland, said:

> With the first business that I had, there was the pressure to breach fatigue rules, as my breaching them was literally the difference between having work or being let go. We were constantly pushed to do more, to overload, to miss breaks and to not record jobs in our logbooks in order to cover up the back-to-back runs that we were doing. For about 12 years, I was forced to operate this way as a driver and an owner-driver, but I don't know how I was functioning (Senate Education and Employment Legislation Committee, 2023, p. 9)

25. He described long hours and the stimulants he was taking to keep going:

> I would work without stopping, Sunday through to Saturday. To stay awake on the road, I turned to methamphetamines. On the Saturday, I would ply myself with alcohol to get some sleep for the whole week ahead; eight hours of sleep a week is what I lived on, and I'd drink something like 19 stubbies just to dissipate that effect. Once I was awake for 13 days straight. On the last run, I convinced my brother-in-law to come with me, because I knew that I wouldn't make it home alone (ibid).

26. He discussed the circumstances in which he moved out of owner-driving work:

> In 2003, a trucking mate of mine, Gary, took his own life—he wasn't the only one. That was enough for me. I got out and I didn't drive for a year. I turned to the industry as an employee…The first pay cheque I got, I asked if they had accidentally overpaid me. The wages were more than I had ever seen or earned as a driver, because they pay the awards. The pressures in transport haven't gone anywhere; I just removed myself from them (ibid).

27. Another driver, John Waltis, who had worked for a company that went into administration (bankruptcy), said:

> The trucks never stopped. I had a truck that was two years old. We had 1.2 million kilometres on it in 2½ years; that is nonstop. I would get to work, hop in the truck and

drive. I would get back and someone would hop straight into the truck. You never had time to check the oil, water or anything because the truck hadn't cooled down. There were pressures on people…to go longer and faster to get the job done. It was rampant in the place (ibid, p. 10).

28. This had severe consequences for safety:

Unfortunately, people didn't learn to say no. During changeovers one bloke was unhooking his truck—I won't go into how to do it—and wound the legs down so he could pull his prime mover out. He walked out and got hit by a truck going up. One of the blokes who was there to change trailers with him cut him in two, from one end of the truck to the other; he was under it. It doesn't do much for the body. It is a shame that anybody gets killed out there. It was one of the worst things that ever happened (ibid).

29. This was not the only death at that firm in the three or four years John worked there. A man called JC:

was put under a lot of pressure. He had exhausted his hours. In the transport industry, the maximum you are allowed to work is 17 hours in any 24-hour period. By the time he got his produce on the truck, he was well and truly over his hours. There were a lot of recordings on phones with police and with Safe Work. He was telling the blokes he couldn't go on; he was tired, and he was going to pull over. They kept on saying, 'If you pull over, we're not going to have the contract anymore.' He had a deadline to meet. He was trying to meet that deadline. Unfortunately, he should have pulled over. The person who was talking to him on the phone and texting him should be held accountable for that. What happened to JC? He ran off the road, hit a tree and then burned to death…I have been to 52 other funerals in my lifetime of driving. It is a terrible feeling. The families are shocked. You should be able to go to work, not have this pressure put upon you, and get home safely (ibid).

30. Frank Black described some of the other financial pressures affecting safety:

Fortunately, I am a mechanic and can do some of the repairs myself to keep my truck in a roadworthy state. Others aren't so lucky, though. I have even had mates ask me to talk them through repairs over the phone, after they have attempted to do some repairs themselves and things simply go wrong. They do the repairs because they cannot afford a mechanic. Then they botch it all up. This is really dangerous, especially if it involves things like adjusting brakes (ibid, p. 11).

31. He spoke about how undercutting affected safety in the industry:

That means we all lose. The destructive competition has turned owner-drivers against each other. The real issue is that we are scrambling to make a living while the wealthy owners of the freight we are carting continue to squeeze our rates to boost their own profits. They don't really care what happens out on the road. We're dispensable. If I go, the next driver will come along (ibid).

32. He also talked of the impact on relationships and mental well-being:

When money is tight, it puts pressure on owner-drivers to work long hours, impacting on fatigue and keeping us away from home for long periods. We miss family events. There

> is financial stress. I know of many relationships that have broken down, including my own. The pressure to stay in business impacts mental health. I know of drivers who have been killed on the job. One we suspect was suicide, by running his truck off the road. We will never know whether it was deliberate or because he had fallen asleep or some other reason (ibid).

33. Yavuz Cikar was the uncle of a food delivery driver who was killed on the job:

> When we sent his body back to his parents in Turkey, we had to wrap him up in plastic film to hold his body together, so they wouldn't see anything...[The company] never reported the death to the work health and safety regulator. They never sent a letter of condolence to the family. They never paid a single dollar towards his funeral expenses or anything else. They said Burak wasn't working for them at the time. The terms of employment for a food delivery rider are that he is only working for them within 15 minutes of a delivery; Burak was 10 minutes over that limit (ibid).

34. A written submission to the inquiry by Mark Reynolds, an owner-driver and auditor within the sector, said:

> Anyone can start a transport company with no assets, experience, licenses, or insurance. They can they quote on, and win, work without any concept of the costs or operating conditions of a compliant, safe transport operator. We have operators like this dragging down the rates and conditions for the whole industry. By the time they either go broke or are forced from the industry by ongoing and continual non-compliance, the damage is done. The next operator will take their place, following their template. They conduct little or no maintenance and often have insufficient or no insurance coverage. No safety management systems or accreditation. Between sham contracting, drivers on student visas, no workers compensation and non-payment of super, these operators have a tremendous financial advantage over safe, legitimate operators... It is no exaggeration to say things are getting worse. The transport industry is plagued by poor health, bankruptcy, relationship breakdowns and mental health issues. Experienced operators...are often being replaced by the type of operator I have previously described (Reynolds, 2023).

35. Another written submission by a former owner-driver and sector auditor, Glyn Castanelli, discussed how:

> For decades, the inability for safe, viable and sustainable businesses has led to risk taking and carnage on our roads. You only have to stop at the many truck driver memorials around our nation to see the devastation left behind. Every one of these drivers killed pursuing their passion of independence on the road has left families broken and devastated (Castanelli, 2023).

36. The oral and written testimony of participants in the sector illustrates the dangers experienced there and the factors behind it.

1.4. Conclusion

37. The RT industry is characterised by extensive contract networks, featuring hierarchical contractual chains that leave many drivers at the bottom of contractual

chains without employee status, and often with the debts associated with ownership of large articulated trucks. Digital platforms are also entering the sector, through grocery or food delivery, last-mile parcel delivery work and digital work allocation in even the heavy freight sector.

38. The industry also has a number of features that are not very desirable: long working hours, low incomes, high debt, insolvencies, and numerous other risk factors for safety including isolation, sedentary work and poor access to healthy food. So the industry experiences not only a poor safety record but also the drivers experience loneliness, depression, musculo-skeletal disorders, fatigue, obesity, diabetes and cardiovascular issues. Drivers report difficult working conditions, time pressures, and the recurring threat of death on the job. The industry has one of the highest fatality rates of any industry.

39. In the context of the preceding facts, the rest of this report will consider various forms of regulation in Australia and overseas, and then the data requirements for assessing the potential impact of RTR in Australia, the availability of such data, and the available empirical evidence in the relationships between road transport remuneration, safety, productivity, costs and prices in the industry. It will argue that: regulation outside the employment relationship can lead to increased productivity, reduced other costs (e.g. of recruitment) and improved safety in road transport; price increases are likely to be minimised (though we do not know by how much) due to increased productivity and reduced costs; the impact on inflation is likely to be very small; and the social benefits of safe rates reduce or more than offset price effects. The penultimate chapter of the report will outline a research agenda for the future, while the final one offers a conclusion and recommendations for future action.

2. More detailed sectoral data

2.1. Introduction

40. This chapter outlines more detailed data about the road transport sector. It should be noted at this stage that the material here also contributes to preliminary attempts to investigate the availability of data for constructing a model of the price effects of regulation, about which more information is provided later.

2.2. How many employees and non-employees?

41. The best data on the numbers of employed persons (employees and self-employed) in the road transport sector come from the Australian Bureau of Statistics (ABS) Labour Force Survey. This section also considers other ABS sources and Australian Tax Office (ATO) statistics.

(a) Estimates from the Australian Bureau of Statistics' Labour Force Survey

42. The most useful data concern the occupation of truck drivers, which can also be looked at alongside delivery drivers, who may also ultimately be subject to Closing Loopholes' regulation. ('Delivery drivers', by ABS definitions, drive vans or cars, but not trucks, to deliver goods.) Unpublished data on the numbers of truck drivers and delivery drivers who are employees and non-employees, obtained from the ABS labour force survey (LFS) via the TableBuilder tool, are shown in Table 1 below.

43. On the surface, the data imply substantial variability from year to year in the numbers of such workers and their share of the employed workforces of truck and delivery drivers. However, it must be remembered that these data are drawn from surveys and therefore are subjected to substantial sampling error.

44. Accordingly, much better estimates of employee and non-employee representation amongst truck and delivery drivers can be obtained by looking at the data over a long period of time and detecting trends from that. Table 2 does this, showing the average estimates over the whole decade, and over the two five-year periods that make up the decade, and the change between those two five-year periods. These estimates are likely to be unbiased and more accurate than any point estimate from a single year. Figure 1 shows graphically the proportion of the truck and delivery driver workforces who are non-employees, and the ordinary least squares (OLS) estimate of the linear trends of those estimates.

45. Table 1 suggests that, from year to year, the proportion of truck drivers who are non-employees can range from 11.6% to 21.9%, and for delivery drivers from 13.2% to 29.0%. However, as mentioned, the real levels of these numbers are unlikely to change by this much, and this huge variation reflects the fact that these are survey-based data.

The larger variance in the estimates for delivery drivers reflects the smaller size of the sample of delivery drivers, as smaller estimates will have larger relative sampling error. One way to reduce sampling error is to average observations over multiple years.

46. Table 2 shows us that, over the decade, an average of 16.3% of truck drivers were non-employees, representing around 31,700 workers. So, too, were 20.4% of delivery drivers, accounting for 12,600 workers. It also shows that, between the two five-year periods 2014-18 and 2019-23, the number of non-employee truck drivers grew by 9,200 or 34%, and their share of employment amongst truck drivers grew by 4.4 percentage points, which is slightly under one third. Likewise, between those two five-year periods the number of non-employee delivery drivers doubled, and their share of delivery driver employment grew by 4.9 percentage points, equivalent to somewhat over one quarter.

47. Figure 1 shows that the OLS trend estimate of the non-employee share in both occupations grew. In the case of truck drivers, the trend over the decade was for the non-employee share to grow from approximately 13% to over 19%. In other words, the trend non-employees' share increased by roughly half over the decade. These numbers imply a substantial increase in the reliance on owner-drivers or other contractors during the period.

48. Readers might see that between 2022 and 2023, the number of independent contractors appeared to increase by as much as 14,000 (about two thirds) — after falling the previous year. We would not take such an increase seriously, as it likely mostly arises from random sampling error in the ABS survey. Much more persuasive, to us, is the long-term increase shown in the OLS trend for non-employees. Over the decade, the number of non-employees rose by something around 2,000 per year.

49. An important matter to consider here is that the trend towards declining use of employees is *not* something that is a general pattern across the whole economy. As Figure 2 shows, the proportion of the national workforce who are employees grew, and the proportion who are not employees actually declined over that decade — from 18% in 2014 to 16% in 2023. That included a drop in the share of what the ABS categorises as 'independent contractors' ('persons who operate their own business, and contract to perform services for others without having the legal status of an employee ') from 8.6% to 7.5%, and a decline in the share of 'other business operators' from 9.0% to 8.6%. The reasons for this are explained in more detail in another paper (Peetz, 2023a), but essentially boil down to growing corporate concentration, and the fact that the push for corporate use of contractors, to reduce costs and transfer risk, can only go so far, because firms need to exercise control. This is factor that puts limits on the uses of all forms of flexibility by corporations and explains why, for example, the use of casual employment has plateaued (Peetz, 2023b). In most settings, waged employment is still the most efficient way for corporations to organise reliable production and exert direct control over labour.

50. The fact that the employment share is declining in road transport, but increasing elsewhere, tells us there are special circumstances applying in that sector.

Table 1: Annual estimates of numbers of employees and contractors, Labour Force survey, 2014-2023

	Aug-14	Aug-15	Aug-16	Aug-17	Aug-18	Aug-19	Aug-20	Aug-21	Aug-22	Aug-23
Truck drivers										
- number of employees('000)	158.4	151.9	162.4	178.6	177.9	170.8	145.1	130.6	180	169.6
- number of independent contractors ('000)	19.6	17.5	30.4	20.1	20.8	30	29.3	21.4	21.1	35.7
- number of other business operators ('000)	8.1	2.4	4.6	7.1	5	6.4	11.2	5.5	9	11.9
- non-employees as % of employed persons	14.88%	11.58%	17.73%	13.22%	12.67%	17.57%	21.82%	17.08%	14.33%	21.92%
Delivery drivers										
- number of employees('000)	35.4	43.4	34.2	33.8	50.2	52.7	58.8	54	61.9	67.8
- number of independent contractors ('000)	6.6	8.6	4.1	7	7.2	7.4	7.6	18	17.8	18.2
- number of other business operators ('000)	2.1	1.2	1.4	1.7	1.4	1.9	1.3	4	4.5	3.8
- non-employees as % of employed persons	19.73%	18.42%	13.85%	20.47%	14.63%	15.00%	13.15%	28.95%	26.48%	24.50%

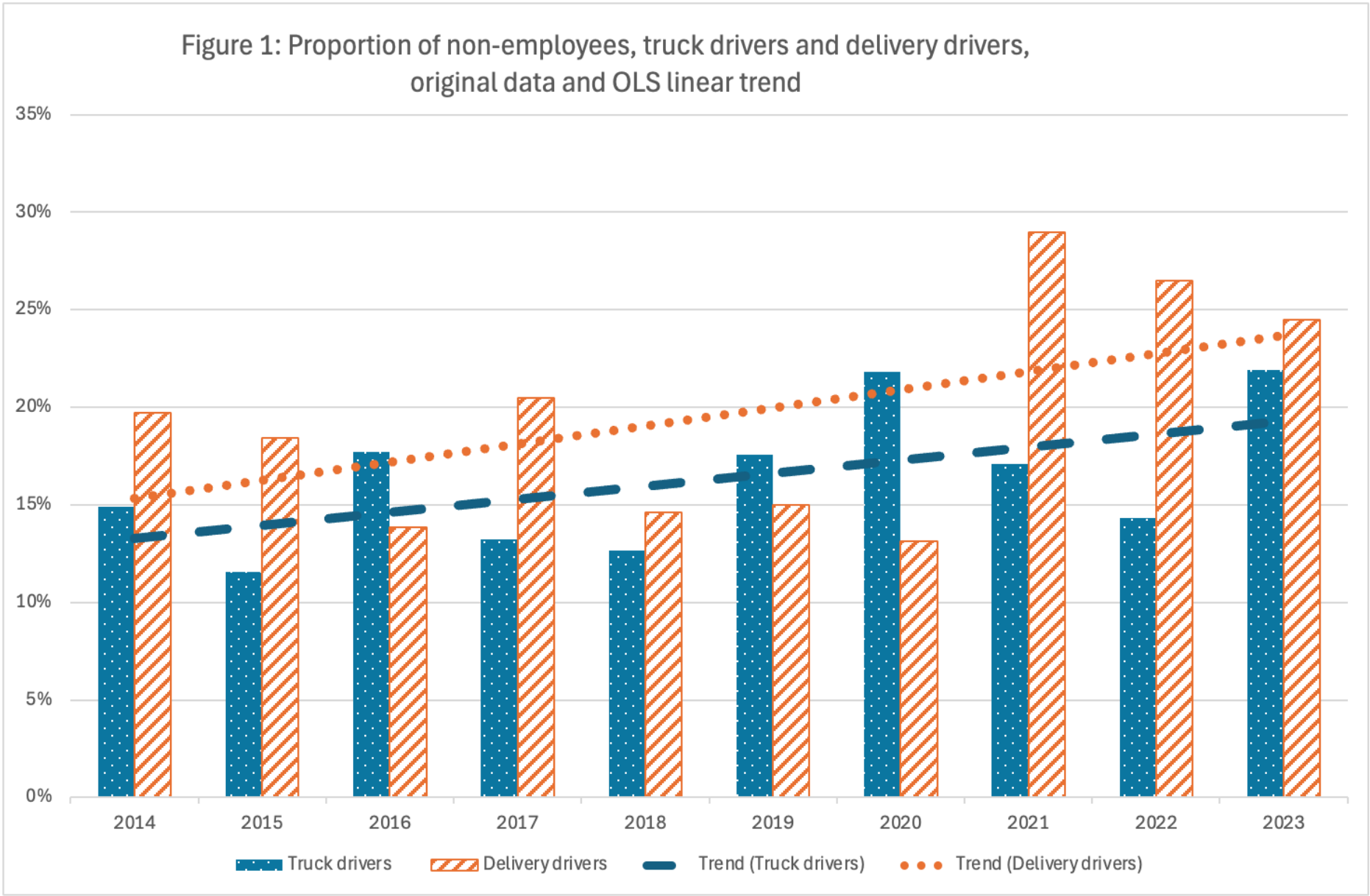
Source: ABS Labour Force Survey, Characteristics of Employment

Table 2: Five-yearly estimates of numbers of employees and contractors, Labour Force survey, 2014-2023

	average 2014-23	average 2014-2018	average 2019-2023	change between 2014-18 and 2019-23
Truck drivers				
- number of employees('000)	162.53	165.84	159.22	-6.62
- number of independent contractors ('000)	24.59	21.68	27.5	5.82
- number of other business operators ('000)	7.12	5.44	8.8	3.36
- non-employees as % of employed persons	16.33%	14.05%	18.57%	4.51%
Delivery drivers				
- number of employees('000)	49.22	39.4	59.04	19.64
- number of independent contractors ('000)	10.25	6.7	13.8	7.1
- number of other business operators ('000)	2.33	1.56	3.1	1.54
- non-employees as % of employed persons	20.36%	17.33%	22.25%	4.92%

Source: ABS Labour Force Survey, Characteristics of Employment

Figure 1: Proportion of non-employees, truck drivers and delivery drivers, original data and OLS linear trend



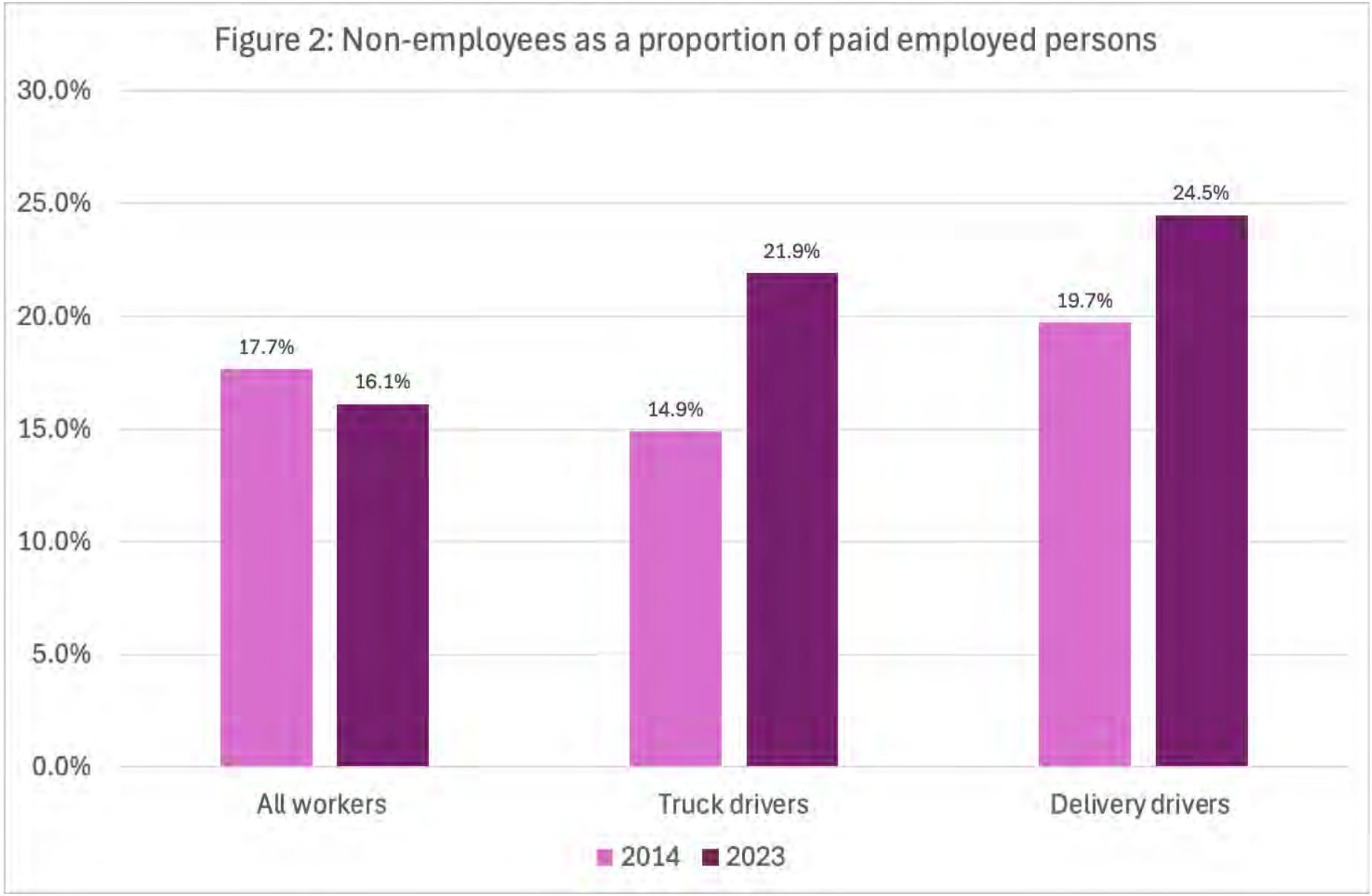


Figure 2: Non-employees as a proportion of paid employed persons
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
17.7%
16.1%
14.9%
21.9%
19.7%
24.5%
All workers
Truck drivers
Delivery drivers
2014
2023

(b) Other Australian Bureau of Statistics sources

51. The ABS (2021) census data gives us people who say they are truck drivers (148,362) and tanker drivers (3,803) and not further defined (206). We can also break those down into employees and owner managers of businesses which can be further broken down into incorporated businesses (12,181) and unincorporated businesses (6,415). Overall, in the census there are 131,657 employee truck drivers and 18,596 who declare they are owner managers. There are also small numbers who say they are 'contributing family workers' (1027) or for whom employment status is 'not stated' (1121).

52. The census data show a number of owner-managers that is less than the number shown in the LFS for any of the ten years 2014-2023. It is unclear why this difference would exist (there is no known bias in the labour force estimate). One plausible explanation is that the LFS collects more accurate data because of the use of experienced interviewers, who will probe to ensure the answer is correct. By comparison respondents complete the census survey alone and one person may fill it in for all the people living in the house. So a census respondent might reply something like 'company director' rather than the nature of their business. The number of business counts described below (in paragraphs 59 and 60) adds to the plausibility of the LFS above the census estimate.

53. The ABS Employee Earnings and Hours (EEH) survey (normally collected in May every second year) contains a lot of detail on employee earnings but, critically, there is nothing in EEH about contractors.

54. Estimates of employment could also be made based on the industry, rather than the occupation, of workers. There is an identifiable 'transport, postal and warehousing' industry within ABS statistics, and for many purposes this can be disaggregated into various transport modes (including road transport) as well as postal and warehousing. However, many workers in transport are not drivers, and many drivers are employed in industries other than transport. For example, in its 'Experimental transport satellite account' (ABS Cat No 5720.0), the ABS estimated that there were some 960,000 transport-related workers in Australia in 2021, but only 605,000 (63 per cent) of these were in the transport, postal and warehousing industry. All owner-drivers of trucks, and driver contractors, would be classed as being in the 'transport, postal and warehousing' industry, as would employees of trucking firms. Drivers employed by client organisations would be mostly classified as working in other industries. These included (most commonly) 'other services', wholesale trade, retail trade, manufacturing, public administration and safety, construction, health care and social assistance, and accommodation and food services. (This is consistent with US practice (Burks SV, Belzer, Kwan, Pratt, & Shackelford, 2010))

55. As an aside, that experimental publication also estimates that the proportion of production (measured as gross value added) accounted for by 'in house' road transport

fell from 76% over the five-year period 2011-2 to 2015-16 to 73% over the period 2016-17 to 2020-21, while the proportion accounted for by 'for hire' road transport rose from 22% to 26%. This indicates that more transport was being undertaken on a 'for hire' basis and reinforces the likelihood (shown through data in the previous section) that the use of non-employee truck and van drivers had increased.

(c) National Skills Commission

56. The National Skills Commission (NSC), in its *Australian Jobs 2021: Transport, Postal and Warehousing* publication, gave much smaller estimates of the numbers of truck drivers (109,000 — about 31% lower than the ABS estimate for 2021) and delivery drivers (34,000 — less than half the ABS estimate). The reason for this discrepancy with earlier data (paragraphs 42 to 48) is unclear.

(d) Australian Tax Office data

57. Tax office statistics show that in 2021-22 there were 169,368 *individuals* who gave their occupation as truck driver. Of the total, 6,856 were female and 162,512 male. Almost all of them, 168,314, reported salary or wage incomes. If applied strictly that would mean only 1,054 could be considered self-employed.

58. However, of the total, 9,907 reported an income or loss from business and 6,956 claimed the small business income tax offset. However, many owner-drivers would be incorporated.

2.3. Numbers of road transport businesses

59. The ABS publication, *Counts of Australian Businesses, including Entries and Exits*, is based on a comprehensive database of all actively trading businesses. That database is built using administrative data from Australian Business Number (ABN) registrations, and business data from the Australian Tax Office (ATO). From that, Table 3 presents figures for the road freight industry. Road freight is, in turn, the largest of the four industry classes within the ABS sub-division 'road transport'. (The other three are 'taxi and other road transport', which also has many businesses, urban bus transport, and interurban and rural bus transport.)

Table 3: Businesses in road freight transport by number of employees.

	Operating at end of financial year, ie June 2023					
	Non employing	1-4 Employees	5-19 Employees	20-199 Employees	200+ Employees	Total
New South Wales	8,950	8,277	1,236	307	22	18,792
Victoria	11,578	6,081	842	241	20	18,762
Queensland	6,240	4,064	895	271	15	11,485
South Australia	2,427	920	312	89	4	3,752
Western Australia	3,980	1,680	424	126	12	6,222
Tasmania	435	243	94	29	0	803
Northern Territory	160	93	32	5	0	290
Australian Capital Territory	265	160	32	7	0	464
Other Territories/Currently Unknown	7	4	3	0	0	12
Total Australia	34,042	21,522	3,868	1,075	75	60,582

Source: ABS (2023) *Counts of Australian Businesses, including Entries and Exits*, 22 August.
Note: National businesses are recorded in this table as being located in their state of registration.

60. Table 3 suggests that the majority (56%) of road transport businesses, are non-employing and these are likely to be owner drivers (also known as owner operators). The numbers seem higher than suggested earlier (which were an average of 31,700 over the decade, likely higher in the later years) but it is possible some of the businesses are not operational.

61. NSW looks to be the only state where less than half of road transport businesses have no employees (48% vs 60% rest of Australia). If these are owner-drivers (subject to the caveats about some such businesses being non-operational) then there are more owner-drivers in Victoria than in NSW, even though it has a smaller area and a smaller population than NSW and has fewer road transport businesses overall. It may be that the institutional arrangements in NSW (outlined more in the next chapter) reduce the incentive on trucking firms to use owner-drivers rather than employees.

62. The ABS estimates survival rates, but only provides data for the subdivision 'road transport' (which also includes taxi and bus firms). Table 4 contains data for the likelihood that new business established 3 years previously would be in existence in June 2023. The survival rate increases for larger employers and reaches 100% for businesses with 20 or more employees. This high survival rate may reflect the very low numbers that entered the industry 3 years ago with that number of employees. Note that some of these cells are empty because no new enterprises in the category had been established three years ago.

63. The most notable aspect of table 4 is that only around one third of sole operator businesses in road freight were still operating three years later. That said, survival rates of very small firms (especially non-employing firms) in road transport are particularly difficult to interpret because we do not know what caused non-survival or what

followed. Owner drivers might go out of business, or they might simply convert to being employees, for instance if a client firm decides to move its road transport business in-house, something that may be particularly likely to happen if the costs of contractor- and employee-provided road transport are equalised. This is a plausible (but unproven) interpretation of the figures for NSW in particular, and it would be consistent with the relatively low proportion of owner-drivers in NSW shown in Table 3, which also appeared to be in decline. (NSW accounted for 27.6% of non-employing road transport firms in June 2019, but only 26.3% in June 2021, even though its share of larger firms with 20 or more employees rose slightly, from 28.5% to 28.6%).

Table 4: Three-year survival rate (%) of businesses established three years earlier, road transport.

	Non employing	1-4 Employees	5-19 Employees	20-199 Employees	200+ Employees
New South Wales	28.0	54	65.4	100	100
Victoria	38.5	57.9	60.0	100	50
Queensland	31.2	54.8	52.4		
South Australia	37.9	62.7	66.7	100	
Western Australia	36.0	62.5	77.8	100	
Tasmania	26.1	55.3	33.3	100	
Northern Territory	27.8	40.0			
Australian Capital Territory	30.6	56.0			

2.4. Incomes of truck drivers

(a) ABS survey data

64. While the ABS Labour Force Survey collects data on weekly income (made available as ranges), the numbers of observations are too small to allow meaningful estimates to be calculated for sub-groups of truck drivers or delivery drivers. In particular, the ABS TableBuilder does not enable publication of data, from that source, on incomes of non-employees.

(b) ABS census data

65. The census contains weekly income brackets, from which Table 5 is constructed.

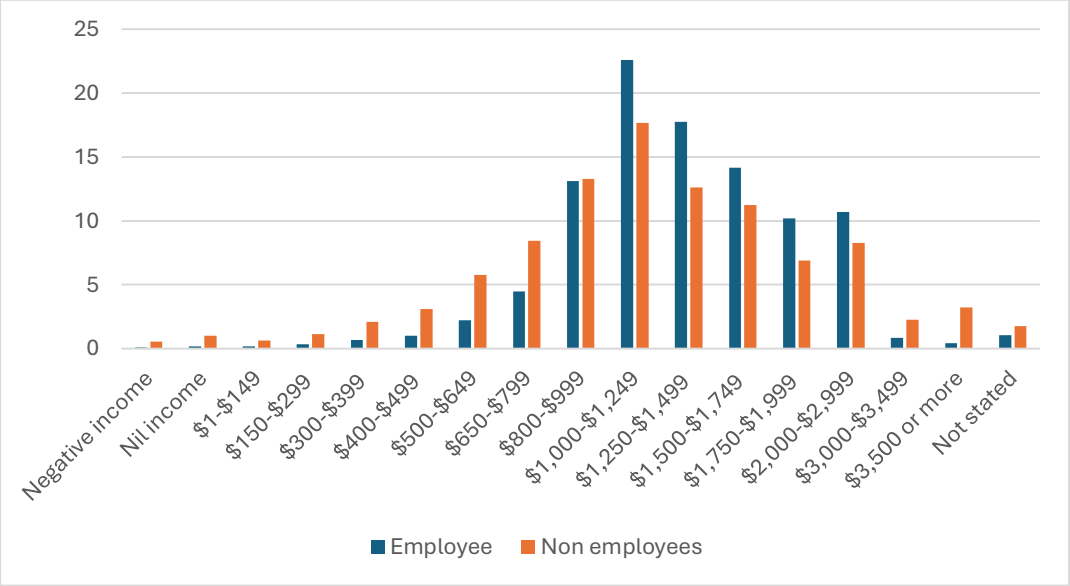
Table 5: Weekly income of truck drivers by employee/non-employee status, 2021

	Employees	Non employees
Negative income	132	115
Nil income	212	213
$1-$149	215	131
$150-$299	478	236
$300-$399	890	436
$400-$499	1,314	641
$500-$649	2,913	1199
$650-$799	5,893	1752
$800-$999	17,277	2755
$1,000-$1,249	29,727	3663
$1,250-$1,499	23,372	2619
$1,500-$1,749	18,634	2327
$1,750-$1,999	13,445	1427
$2,000-$2,999	14,099	1716
$3,000-$3,499	1,097	471
$3,500 or more	568	666
Not stated	1,391	367

Source: ABS 2021 Census data.

66. Figure 3 presents these data graphically, which may enable a better idea of the most common income ranges.

Figure 3: Proportion of employee and non-employee truck drivers by income group, %.



67. From Figure 3 it is apparent that the most common income range in the census is the $1,000 to $1,250 a week range and that applies for both employees and non-employees. The graph also shows that the non-employee distribution is more dispersed with a lower peak in the middle and fatter tails. In particular, non-employees are less likely to be in the $1,000 to $2,999 range, and more likely to be above or below that

range. These findings, especially the over-representation of non-employees below $1,000 a week, are consistent with some non-employees being exploited (even while others do quite well). Some 7,478 drivers had earnings under $1,000 a week. The data do not allow us to reject innocent explanations such as business owners not drawing all of the business's income. On the other hand, the wide income bands may be hiding a lot of the detail.

68. One convincing interpretation, though, is that non-employees cover a range of situations from being on relatively low income, and plausibly exploited, to being on relatively high income, and plausibly quite comfortable.

(c) Australian Taxation Office data

Individuals, trusts and partnerships

69. The ATO does not give a lot of detail, but we can report that 71% of drivers earned an income in the range $45,001 to $120,000. Numbers for the other ranges are given in Table 6. These are not split into employee and other.

Table 6: Individual truckdrivers by income range

	Number	%
a. $18,200 or less	6,696	4.0
b. $18,201 to $45,000	26,088	15.4
c. $45,001 to $120,000	120,335	71.0
d. $120,001 to $180,000	15,000	8.9
e. $180,001 or more	1,249	0.7
Total	169,368	100.0

Source: ATO Statistics

70. The ATO does not keep data on hours worked so we cannot know if the lower income groups were working fewer hours or not.

71. In addition to the above there were 7,582 *trusts* operating in the industry road freight transport, and 6,658 of them reported total income of over $7 billion or $1,086,830 per trust. The tax office total income should be interpreted as gross revenue since various deductions are not included in the total figures. Of these trusts, 6,754 declared a net income or loss from business with an average net income of $64,975. However, 2,297 of these trusts made payments for wages and 1,118 made payments to 'associated persons '. These are likely to reflect payments from the trusts to the drivers.

72. In addition, 2,908 *partnerships* were operating in the industry road freight transport. Of these, 2,675 declared a total income of $1.28 billion or an average $439,581. Again, payments were made to wage earners and associated people. It is assumed that these partnerships include the drivers as well as the drivers' spouse. Just

crudely adding the numbers of individuals with business income, the trusts and partnerships we get around 20,000 entities involved. The trusts, and definitely the partnerships, may be responsible for more than one individual in the industry. These numbers (individuals, trusts and partnerships) seem small when compared with other ABS data. For example, at the end of 2022-23 there were an estimated 34,042 businesses in road transport that employed no-one. Most would be self-employed sole operators. In addition, there were another 21,522 businesses with 1 to 4 employees. These may include examples where the business employs just one person who is also the owner of the business. There may also be operators who employ a partner to do the books, have a second or other trucks and employ other driver/s.

(d) Labour share of income in road transport

73. The labour share of income in road transport was 56% of value added using the 2023 Australian Industry figures or 58% using the previous year's input output data. Non-labour income is therefore 42% to 44%. The non-labour income or gross operating surplus includes some unincorporated business income. These estimates do not tell us about the relative or absolute incomes of employee drivers or non-employees.

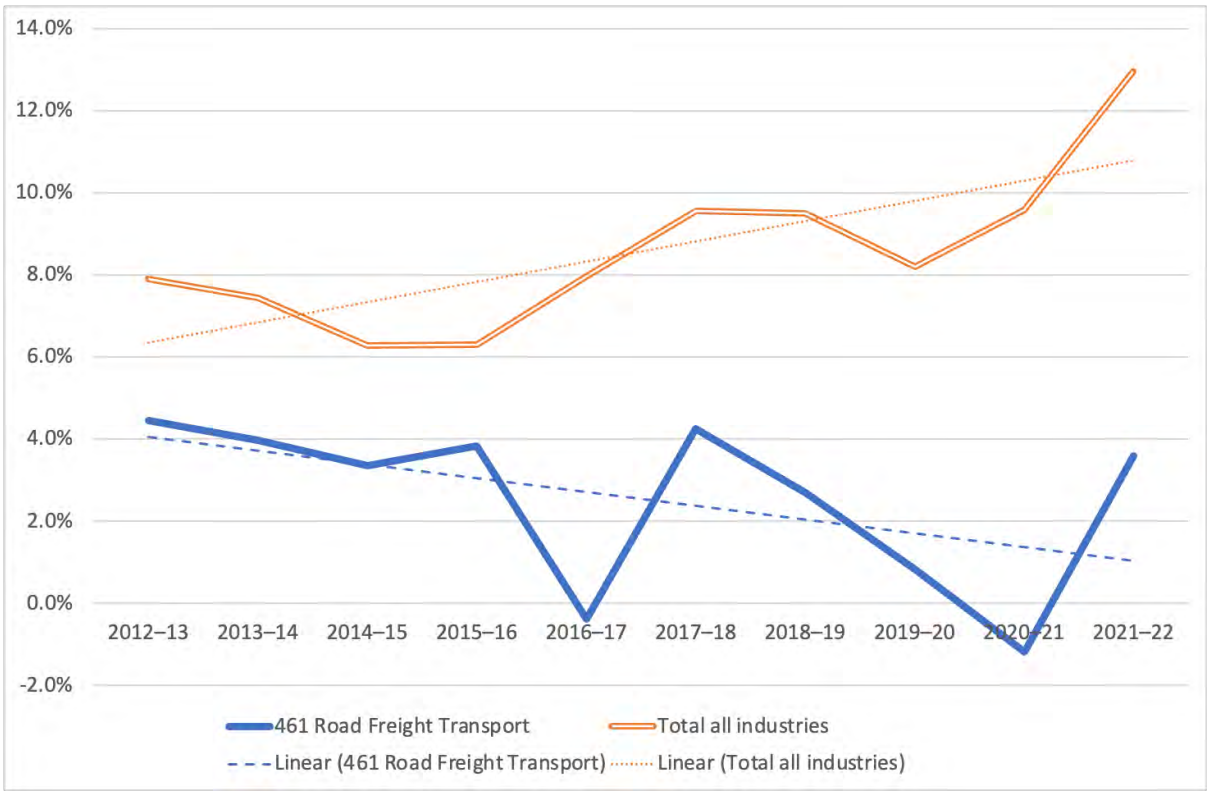
2.5. Company profitability

74. ATO statistics show that the road freight transport industry included 24,006 companies and 22,297 declared a total income (revenue) of $ 37,266,554,514. That gives an average revenue of $1,670,000. Some 21,862 declared a profit or loss with the average a profit of $ 60,125. This implies an average profit ratio (the ratio of profit to revenue) of 3.60% in 2021-22. The profit ratio is not the same as the rate of return, which would be based on capital invested, not revenue. ATO figures do not enable the calculation of a return on investment.

75. At 3.60%, the profit ratio in road freight transport was less than a third of the profit ratio across all industries, which averaged 12.96%. Of course, profit ratios can be heavily influenced by economic conditions, and so to consider the economic conditions in an industry it may be more useful to look at trend and average profit ratios over a longer period such as a decade.

76. Figure 4 shows annual profit ratios for road freight transport and for the national all-industry sum over the decade from 2012-13 to 2021-22. It also shows the linear ordinary least squares trend over the decade. Nationally, annual profit ratios showed a trend increase over the decade, but road freight transport showed a decline. One should be careful in interpreting this divergence, as road freight transport may have been especially adversely affected by the height of the COVID-19 pandemic; in the absence of that, the trend would have been much flatter.

Figure 4: Annual profit ratio, road freight transport and all industries, 2012-13 to 2021-22. [(a)]



(a) Profit ratio = net profit or loss per company divided by total income per company.
Source: Australian Taxation Office, Taxation statistics 2021–22, Table 5: Companies, Canberra, https://data.gov.au/data/dataset/taxation-statistics-2021-22/resource/36d1e539-265c-41c4-a0f3-924a3a226ce1?inner_span=True

77. Still, the second and perhaps more notable feature of Figure 4 is that it shows the annual profit ratio in road freight transport was less than the national average in *every* year. Examining this issue further, Table 7 shows total profit ratios over the decade from 2012-13 to 2021-22 in each broad industry (as defined by the ABS) and selected fine industries.

78. Road freight transport had a total profit ratio over the decade of 2.48%, again less than a third of the all-industries total profit ratio of 8.81%. It was also lower than the profit ratio of any broad industry, other than Information Media and Telecommunications, which itself was dragged down by legacy media (newspapers, television, etc.). Within the broad industry of Transport, Postal and Warehousing, Road freight transport, unsurprisingly, had one of the lowest profit ratios, along with Postal and Courier Pick-up and Delivery Services, another sector with a heavy gig-work component, and air transport.

Table 7: Total profit ratios by industry, Australia, 2012-13 to 2021-22 [(a)]

K. Financial and Insurance Services	19.02%
L. Rental, Hiring and Real Estate Services	17.63%
B. Mining	14.10%
P. Education and Training	12.61%
Q. Health Care and Social Assistance	9.87%
R. Arts and Recreation Services	9.45%
A. Agriculture, Forestry and Fishing	6.46%
M. Professional, Scientific and Technical Services	6.18%
C. Manufacturing	6.11%
S. Other Services	5.92%
E. Construction	4.86%
O. Public Administration and Safety	4.49%
D. Electricity, Gas, Water and Waste Services	4.15%
H. Accommodation and Food Services	4.09%
G. Retail Trade	4.04%
N. Administrative and Support Services	3.70%
F. Wholesale Trade	3.65%
I. Transport, Postal and Warehousing	3.36%
of which	
- Road freight transport	2.48%
- Postal and Courier Pick-up and Delivery Services	1.64%
- other transport, postal and warehousing	3.72%
J. Information Media and Telecommunications	2.38%
of which	
- legacy media (b)	-0.71%
- other information media and telecommunications	3.61%
Total all industries	8.81%

(a) Profit ratio = net profit or loss per company divided by total income per company.
(b) 'Legacy media' comprises the classifications 541 Newspaper, Periodical, Book and Directory Publishing, 551 Motion Picture and Video Activities, 561 Radio Broadcasting, 562 Television Broadcasting, and 601 Libraries and Archives

Source: Australian Taxation Office, Taxation statistics 2021–22, Table 5: Companies, Canberra, https://data.gov.au/data/dataset/taxation-statistics-2021-22/resource/36d1e539-265c-41c4-a0f3-924a3a226ce1?inner_span=True

79. The above data do not enable us to estimate the price effects of cost increases in road freight transport, but they do show that profit margins in the sector are persistently low, consistent with the description of the industry elsewhere in this report.

2.6. Value of production

80. The ABS publication, Australian industry, gives total sales and service income for road transport as $82,282 million in 2022-23. This publication covers only private businesses so any government owned operation will not be included.

81. The value added created by the industry is much lower at $31,678 million being made up of a wages bill of $17,669 million and non-wage incomes of $14,009 million. Non-wage incomes include what the ABS calls 'mixed incomes'.

82. We get a slightly better breakdown if we use input output data (Table 7). However, that publication includes any public sector activity in the industry. Also, the figures are a year behind the other data source. Nevertheless, total product is given as $72,400 million or some 3% of GDP.

Table 8: Road transport industry data 2021-22, $m

Total Intermediate inputs	**39 117**
Compensation of employees	18 868
Gross operating surplus & mixed income	11 718
Gross operating surplus	6 578
Gross mixed income	5 140
Taxes less subsidies on products	989
Other taxes less subsidies on production	1 708
Australian Production	**72 400**
Gross value added	32 294

Source: ABS Input Output Tables

83. If we think of the road transport industry as turning inputs into outputs, then it combines $39 billion of inputs with $19 billion in payments to employees to produce a product worth $72 billion with the industry making profit of $14 billion. Some of the main intermediate goods include the products of the industries shown in Table 9, which relates to industries whose value to road transport was $500 million or more.

84.

Table 9: Major inputs into road transport, $m

Inputs	Value ($m)
Petroleum and coal product manufacturing	6 616
Automotive repair and maintenance	5 691
Road transport	4 711
Professional, scientific and technical services	3 913
Heavy and civil engineering construction	1 809
Wholesale trade	1 704
Public administration and regulatory services	1 534
Transport support services and storage	1 362
Non-residential property operators and real estate services	1 240
Employment, travel agency and other administrative services	959
Auxiliary finance and insurance services	877
Motor vehicles and parts; other transport equipment manufacturing	709
Other repair and maintenance	611
Postal and courier pick-up and delivery service	551
Rail transport	546
Finance	531
Rental and hiring services (except real estate)	501

2.7. Users of road transport

85. More importantly, through the ABS input-output tables, we can also see which industries most use road transport. Table 10 shows all industries (at the ABS 3-digit level) that purchase more than $400m in road transport services. Not surprisingly, in light of the way contractual chains operate in the industry, the largest purchaser of road transport services is other firms in the road transport industry. Behind that, the largest users are, in order: construction services, wholesale trade, retail trade, transport support services and storage, postal and courier pick-up and delivery service, residential building construction, and sheep, grains, beef and dairy cattle, followed by a series of manufacturing industries mixed in with several from mining, construction and health care.

Table 10 Users of road transport

Industry	Purchase of road transport	
	Value ($m)	Share of total
Road transport	4 711	9.3%
Construction services	4 235	8.3%
Wholesale trade	4 041	8.0%
Retail trade	3 182	6.3%
Transport support services and storage	2 097	4.1%
Postal and courier pick-up and delivery service	1 898	3.7%
Residential building construction	1 480	2.9%
Sheep, grains, beef and dairy cattle	1 478	2.9%
Dairy product manufacturing	1 379	2.7%
Cement, lime and ready-mixed concrete manufacturing	1 141	2.2%
Meat and meat product manufacturing	1 121	2.2%
Non-ferrous metal ore mining	927	1.8%
Non-residential building construction	896	1.8%
Health care services	889	1.8%
Food and beverage services	814	1.6%
Heavy and civil engineering construction	785	1.5%
Other wood product manufacturing	772	1.5%
Iron and steel manufacturing	758	1.5%
Sawmill product manufacturing	741	1.5%
Other food product manufacturing	720	1.4%
Basic chemical manufacturing	678	1.3%
Coal mining	619	1.2%
Basic non-ferrous metal manufacturing	591	1.2%
Structural metal product manufacturing	540	1.1%
Residential care and social assistance services	535	1.1%
Professional, scientific and technical services	505	1.0%
Grain mill and cereal product manufacturing	490	1.0%
Rail transport	482	0.9%
Polymer product manufacturing	470	0.9%
Auxiliary finance and insurance services	468	0.9%
Non-metallic mineral mining	432	0.9%
All other industries	10 514	20.7%
Total	50 774	100.0%

Source: ABS Australian National Accounts: Input-Output Tables, 2021-22, Table 2: Input by industry and final use category and Australian production and imports by product group. https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-input-output-tables/2021-22/520905500102.xlsx

2.8. Conclusions

86. We can make the following observations about the sector. First, around a decade ago, non-employee truck drivers accounted for about one in eight truck drivers. A decade later, that share was closer to one in five. There is thus a steady underlying trend for the share of truck driving undertaken by owner-drivers and/or contractors to *increase*. This is very different to the trend across the economy as a whole, which is of a *declining* proportion of employed people who are not employees.

87. Second, the road freight transport industry is characterised by low profits. The profit ratio (profit as a proportion of revenue) is roughly at least two thirds lower in road freight transport than it is nationally. It is one of the lowest profit parts of the economy. Other industries, to which road transport provides services, almost all experience higher profits than does road freight transport itself.

88. Third, the most prominent of those other industries, to which firms in road transport provide services are (in order): construction services, wholesale trade, retail trade, transport support services and storage, postal and courier pick-up and delivery service, residential building construction, and sheep, grains, beef and dairy cattle, as well as several manufacturing industries. Of course, many firms in road freight transport are contracted to provide services to other firms in road freight transport that are higher up the contractual chain.

89. Fourth, the road freight transport sector in NSW appears to have a smaller role for owner-drivers and/or driver contractors than does the rest of Australia, though they remain significant. The reforms to remuneration policy in NSW could plausibly have had some impact on the structure of the industry, but they certainly have not destroyed the owner-driver or driver-contractor sectors, which remain important in that state.

90. That said, there are important limitations to the available data. While we know the numbers of employee drivers versus non-employee drivers, for example, we do not know much about the incomes of employee and non-employee drivers, or the proportions of non-employee drivers who would be in receipt of labour incomes that are below any particular thresholds based on, say, award rates of pay.

3. Innovation and Regulation in Australia and Internationally

3.1. Introduction

91. Over the last several decades, truck drivers in many countries have experienced a general deterioration in pay and conditions. Inequality among drivers of different nationalities or working under different forms of employment has increased. In Europe, for example, facing excessive competition and low operating margins, transport companies have sought to minimise costs by exploiting the large gap in wage levels and social security protections between western and eastern European countries (Belzer & Thörnquist, 2021). This has led to human rights abuses and an overall deterioration in pay and conditions in recent years. This in turn has led to pressure for 'safe rates' systems.

92. The objective of 'safe rates' policies is to ensure the health and safety of RT workers and, by extension, the general public. Specifically, safe rates policies involve the imposition of mandatory legal obligations designed to ensure that all RT drivers receive the same *minimum* work protections, the same *minimum* remuneration, and prompt payment (Nossar & Amoresano, 2019). Safe rates policies also add supplemental obligations to freight owners who exercise significant influence over the flow of RT work within RT contractual chains and businesses that exercise a large degree of control over entire RT contractual chains (Nossar & Amoresano, 2019).

93. In Australia, regulation of transport labour has been made more difficult than would otherwise be the case, both by the contractor status of many workers, and by Australia's federal system of industrial relations regulation. The former is a problem because most labour law is aimed at participants in the employment relationship — employees and employers. Yet owner-drivers in Australia (and most other countries) are typically *not* employees. Many protections and minimum entitlements exist for *employees* (through, for example, the *Fair Work Act 2009*), and it is clear who has to pay for those protections and entitlements: in most cases, the *employer*. That simple clarity does not always exist for workers — typically classed as contractors or self-employed — who sit outside the employment relationship. Owner-drivers of trucks are amongst such workers.

94. Problems in and regulation of the American and European road transport sectors is compared in Belzer and Thörnquist (2021) and Liem and Baek (2024). This chapter builds on those analyses and examines recent developments in safe rates systems in Australia and several other jurisdictions, along with other attempts to regulate road transport outside the employment relationship, concluding with a brief discussion of a logistics system operating at a port in NSW that is not directly aimed at establishing 'safe rates' but which has an impact on 'dwell time' that is similar to the effect that several 'safe rates' systems seek.

95. We do not look at the much broader question of direct regulation through matters such as speed limits, speed-limiting devices, lane departure warning systems, autonomous emergency braking systems, fatigue warning systems and tyre monitoring systems. These policies, attempting to directly regulate the driving hours, vehicle speed or other factors that might directly influence truck crashes or to require various safety-enhancing technologies, are outside the scope of this report.

3.2. Australia: The legislated potential for regulation outside the direct employment relationship

96. The federal system has meant that mostly different, sometimes conflicting laws have operated at state and federal levels for many decades, and which laws applied to which workers depended on the interpretations of constitutional coverage by tribunals and courts. On average, employees of larger firms operating interstate were covered by federal laws, the remainder often by state laws. This changed when most employees were brought under federal constitutional coverage by legislative reforms of the 2000s, but most state government employees in most states were left in state systems. If states had established laws to protect certain types of non-employees, they also might remain within that jurisdiction.

97. In New South Wales, one of the first modern attempts to regulate a group of vulnerable workers who were not employees concerned apparel outworkers. These constituted a classic 'periphery' workforce, comprising very low paid people who were typically classed not as employees but as contractors (Thorpe, 2000). The aim of NSW legislation was to deem these contractors as employees (Nossar, Johnstone, Macklin, & Rawling, 2015). Subsequently, Queensland gave the state tribunal the power to declare certain contractors to be employees after considering various factors (Department of Industrial Relations (Queensland), 2001). At the federal level, the *Fair Work Amendment (Textile, Clothing and Footwear Industry) Act 2012* then extended various provisions of the Fair Work Act to contract outworkers.

98. New South Wales took an alternative approach with road transport drivers, not to redefine self-employed workers as employees, but to instead regulate payments and selected other aspects of work outside the employment relationship. The NSW Parliament in 1979 legislated to allow the New South Wales Industrial Relations Commission (NSW IRC) to regulate minimum terms of contracts for owner-drivers of trucks and other 'contract carriers'. Now known as Chapter 6 of the New South Wales *Industrial Relations Act 1996*, this statute enables the NSW IRC to issue 'contract determinations' that specify minimum standards for the drivers concerned. The Industrial Relations Commission can regulate pay rates, union recognition and dispute settlement, for owner drivers. These standards are analogous to awards in NSW labour regulation, since they set minimum terms and conditions by industry. For example, the 'General Carriers Contract Determination 2017' establishes, for various types of owner-drivers of trucks, minimum rates of remuneration, comprising a per-kilometre rate, an hourly rate (both varying by truck size and type), allowances and a minimum earnings guarantee, and formulae for adjustment of these, plus entitlements to annual leave, rest breaks and various minimum standards of work and obligations. That

Determination also establishes union representation rights, where sought by workers. The NSW IRC can also approve 'contract agreements', which are analogous to 'collective agreements' in employee relations regulation, between owner-drivers and firms.

99. This approach to regulation avoided treating the owner-drivers as employees. The Chapter 6 legislation has survived changes of government and sustained periods of conservative rule. This system promotes shared interests among unions and those transport operators who would otherwise be forced to contract work out to compete against unsustainable contracting practices and low rates. The parties reach agreement on some matters, but on others disagreement leads to arbitration. Support for the system has come from key companies that are able to obtain certainty through minimum standards and, to some degree, be protected from unfair competition.

100. The Chapter 6 framework very clearly formed the model for the drafting of recent legislation in Queensland to provide protection for independent courier drivers — in the form of Chapter 10A of the Queensland *Industrial Relations Act 2016*. At time of writing, that Chapter had not been proclaimed to take effect, as it would be made largely redundant by what became the federal Closing Loopholes No. 2 Act.

101. While the NSW legislation was the only state legislation that allowed for the setting of owner-driver payments by an industrial tribunal, two other states have passed laws aimed at providing some protection for that group. However, the schemes in Western Australia and Victoria were:

> reactive schemes which are almost entirely focussed upon remedying unfair business practices in contract setting only after a breach has occurred. Indeed, at least under the Victorian scheme, the individualised complaint-based approach risks the 'blacklisting' or other actions against drivers making complaints, which reduces the effectiveness of that scheme (Rawling & Kaine, 2012, p. 248)

102. The NSW Chapter 6 system appears to have been particularly effective. Not only has it been very resilient (having lasted for more than four decades) but it has been associated with demonstrable declines in road deaths in the heavy road transport sector. A major study showed that, since 1989, the average annual decline in fatal accidents involving articulated trucks in New South Wales was around double the declines in other fatal road accidents in the state or in fatal road accidents in the rest of Australia (Peetz, 2022). Heavy vehicle accidents accounted for a declining share of road deaths in New South Wales but not in the rest of Australia. The steadily declining share of fatal heavy vehicle crashes in New South Wales was far greater than the decline in its share in other fatal crashes. The long-term decline in articulated truck accidents in the state cannot be explained by any factors that influence general road safety in New South Wales or across the rest of Australia. The study estimated that over 205 lives have been saved as a result of Chapter 6.

103. One other notable aspect of that study, though, was its revelation of the substantial annual variation in the number of road deaths. The implications of this are

discussed in chapters 4 (paragraphs 225 and 226) and 8 (paragraph 369), in the short life of the Road Safety Remuneration Tribunal, discussed immediately below.

104. At the federal level, the first major attempt to link driver remuneration to safety in Australia was the establishment of the Road Safety Remuneration Tribunal (RSRT) in 2012, opposed at the time by the federal Liberal-National Coalition (Abetz, 2012). The RSRT sought to establish minimum piece rates for long-distance truck drivers delivering freight between varying locations. In its 2013 federal election policy, the Coalition promised to 'urgently review' the RSRT as there was 'no evidence' that it was necessary (Liberal Party of Australia, 2013). After the Coalition won the election, Minister Abetz commissioned a review 'with a deregulation focus' and referred to industry claims of 'onerous and unnecessary compliance burdens' (Abetz, 2013; Australian Government, 2014). 'Jaguar Consulting' reported in April 2014 that 'the safety record of the Australian heavy vehicle industry is … relatively good', that 'there must be significant doubt as to the potential for regulation…to yield substantial safety benefits in any context', that 'there is not an industry-wide issue of low remuneration' and that there was 'no evidence of the effectiveness of a model consistent with the RSRS in improving safety in other jurisdictions' (R. D. Smith, 2014). A follow-up report, for which management consultants PwC were paid, greatly inflated the cost of the RSRT system and likely understated the benefits (Belzer, 2016). Meanwhile, the RSRT issued its first order (which was not about remuneration) with effect from April 2014 and a second order (which was about payments) with intended effect from April 2016.

105. The RSRT faced a concerted campaign by a conservative national government and by the core corporations that benefited from low-cost owner-driving, along with small fleet owners, for whom many owner-drivers worked, and who reportedly threatened to withhold work from owner-drivers if the RSRT system was continued, plus some owner-drivers, who faced a loss of income from withheld fleet-work or empty 'backloads'[3] (e.g. Kruger, 2016; Rawling, Johnstone, & Nossar, 2017). In April 2016, three months before the forthcoming federal election, the Coalition Government demonised the RSRT, greeted and addressed protesters at a 'convoy to Canberra', and then abolished the RSRT. The dissolution of the RSRT appeared due not to any inherent failure in the potential for direct regulation outside the employment relationship, but to the institutional and political circumstances of the time and to some questionable actions by the regulator. 'Evaluations' had been commissioned with a political focus (to facilitate the abolition of the scheme) and have serious weaknesses that render them of little value (Belzer, 2016), including that the RSRT's payments order never even had sufficient time to take effect before the RSRT was abolished.

106. It was in this context that the federal Labor Party, when in Opposition at the federal level, sought to develop a new, national framework for regulation of road transport remuneration that it could establish when in government. This culminated in Part 16 of the Closing Loopholes No 2 Act. This Act allowed for the establishment of standards for pay and other conditions for many gig workers and road transport workers,

[3] Backloads, on the return legs of trips, are usually considerably smaller than the main loads which generate most income for owner-drivers; these are important income supplements but cannot attract the same compensation as full loads.

that is 'regulated workers'. It focused on vulnerable workers and details consultation processes the FWC must engage in before finalising a decision on standards in road transport.

107. The *Closing Loopholes No. 2 Act* diverged from Chapter 6 in enabling the FWC to make orders regarding participants in road transport 'contractual chains'. The provisions regarding 'contractual chains' in road transport were an important shift in labour law and reflect the fact that many decisions affecting the pay of owner-drivers are actually made further up the contractual chain. However, while pathbreaking in road transport regulation, they are not the only aspects of the FW Act to deal with contractual chain issues. In particular, another section in the FW Act already holds a franchisor responsible for certain acts that occur within their contractual chain, even if they are not the formal employer of the workers involved and makes a holding company accountable for certain acts that occur within their contractual chain, again even if they are not the formal employer of the workers involved. These provisions were introduced in 2017.

108. The Act allows for collective agreements covering regulated workers and, like Chapter 6, provides exemptions from Commonwealth competition law for matters relating to orders or collective agreements. The FWC is instructed to avoid unreasonable adverse impacts upon industry participants, including on sustainable competition, business viability, innovation and productivity. The Act tells the FWC to tailor regulation to the circumstances of the workers and their industry, and not give preference to one business model over another. In other words, once costs are taken into account, it should mean regulated workers receive similar pay to award-based employees performing similar work. A corollary is that the starting point for regulation of vulnerable gig workers should be the standards that apply for relevant employees.

109. The legislation does not redefine any 'regulated workers', including RT employees, as employees. Indeed, it prevents the FWC from doing this through the 'regulated worker' processes. It reflects a view that, in Australia, the way to influence the incomes and incentives facing workers and other participants in the RT chain, for the purpose of improving safety and other outcomes, is to regulate arrangements outside the employment relationship, rather than to attempt to redefine, as employees, people who are not presently employees.

110. The longevity of the NSW Chapter 6 regulation both tells us that such regulation is possible and provides an opportunity to test hypotheses about such regulation and its effects on outcomes in the RT sector.

3.3. South Korea: Safe Rates system

111. The Korean system was established through amendments in 2018 to the Trucking Transport Business Act (TTBA), and the subsequent establishment of a Safe Rates Committee, to set the relevant rates, in 2019. Minimum safe rates first took legal effect in January 2020. TruckSol also attempted to supplement legal rates through agreements

with freight owners (the firms at the top of contractual chains, referred to in the USA as ‘cargo owners’) and transport companies at the regional and local level.

112. The relevant union, the Cargo Truckers Solidarity Federation (TruckSol, by then part of the Korean Public Service and Transport Workers’ Union), lacked legal collective bargaining rights as the drivers were technically self-employed. Korean law encourages the *ji-ip* system, under which truck drivers own their trucks but must contract to trucking companies that usually hold the trucks’ license and permit them to operate. This makes them entirely dependent contractors. The safe rates system applied only to articulated vehicles used for containers and bulk cement, representing only 6.5% of the approximately 450,000 commercial trucks. Thus, although the system operated on a national scale, its scope of application was quite narrow.

113. There were two types of ‘safe rates’: ‘safe transport rates’ paid by freight owners to firms below them in the contract chain (transport companies, freight forwarders, transport franchise businesses, and owner-drivers hired directly by these freight owners); and ‘safe contract rates’ paid by the intermediate firms (mostly transport companies) to contractors, that is to owner-drivers. Most owner-drivers were hired by intermediate firms and hence were paid the ‘safe contract rates’.

114. Safe rates were calculated as a sum of three components: fixed costs, variable costs and a designated appropriate driver income. Fixed costs and hourly costs were estimated through surveys of drivers’ costs, and then pro-rated by the appropriate number of hours worked or kilometres driven. The hourly income designated as appropriate was then added to this amount, multiplied by the average number of hours for the relevant trip.

115. The Safe Rates Committee was composed of three representatives of each stakeholder group, and four public interest members. Membership included representatives of truck drivers, transport companies, freight owners, and ‘the public interest’, the last being academics and experts appointed by the Ministry of Land, Infrastructure and Transport (MoLIT). Through this structure the freight owners were integrated into the process. Decisions were based on consensus, though if there was disagreement a vote was held. Typically, the public interest members would propose compromise outcomes.

116. The law stipulated penalties for violations, but enforcement had problems. Safe rates complaint centres were established, yet there was an important limitation: workers’ anonymity was not protected if they made claims. There was also a joint inspections team established by MoLIT, but it was not a formal body and its activities were seen as inconsistent.

117. A ‘subsidiary provision’ established by the safe rates committee also had the effect of creating a financial incentive for trucks to be unloaded and loaded within a maximum period.

118. The Korean law lasted only until December 2022. At that time, a sunset clause included in the original legislation took effect, and the legislation lapsed. This happened despite an extensive campaign, including multiple strikes by TruckSol, and wide support by the public (one survey indicated that those supporting continuation of the system outnumbered those opposed by almost 2:1 (newsis.com, 2022)). The lapse occurred due to a change of government since the initial legislation was introduced.

3.4. Brazil: Minimum Freight Floors

119. The Minimum Freight Floors system (MFF) was introduced after a large strike by owner-drivers ('autonomous drivers') and transport companies, arising from increased diesel costs. It was signed into law in August 2018.

120. The Brazilian system has broader coverage than the Korean system had, but it sets minimums that are based only on estimated costs and makes no allowance for any appropriate income. Thus, payments to owner-drivers cannot fall below the average estimated costs that drivers face, but income is determined by the balance of bargaining power between driver and company.

121. The law stipulates a formula by which rates were initially calculated, when new rates are to be published and the process of revision. It also provides guarantees for participation by freight owners, freight transport companies, freight transport cooperatives, trade unions, and 'autonomous drivers'. It further specifies penalties for violations and documentation requirements. Updated rates are the responsibility of the Agency for Land Transport (ANTT), a government department.

122. The system is based around twelve freight subcategories, and these cover almost all main freight types transported in Brazil. Unlike the Korean Safe Rates system, there is no sunset clause (though its constitutionality was challenged by freight owners).

123. The calculation of fixed and variable costs includes a mechanism that accounts for variability in the price of diesel. Standards apply across the nation, though this raises controversy over whether the specific characteristics of different regions are adequately taken into account.

124. A separate law specifies additional fees that freight owners must pay if a stipulated time for loading and unloading a vehicle (five hours) is exceeded.

125. There is also a government-provided line of credit to 'autonomous drivers' to support vehicle maintenance and repair costs, introduced in response to the high incidence of truck crashes related to poor maintenance.

126. Under Article 6 of the MFF Law, when setting rates, the ANTT must guarantee equal participation to freight owners, freight transport companies, freight transport cooperatives, unions, and autonomous truck drivers. This mostly occurs through public

hearings, so the system is based on administered rates rather than rates negotiated through stakeholder meetings. There is no separate enforcement body. ANTT carries out irregular checks at strategic locations.

3.5. Canada: Port of Vancouver container trucking minimum rates system

127. The Vancouver system arose after successive strikes by port container truck drivers in 1999, 2005 and 2014. The last of these led to an agreement between the federal and provincial governments, the port, and unions.

128. The Vancouver system applies only to container transport and only covers trips within a defined area of 20 municipalities around the Port of Vancouver (the 'Lower Mainland', an area with a population of approximately 3 million). The system relates both to trips between the port itself and a facility in the Lower Mainland ('on dock' trips), and to trips between two separate facilities (other than the port) in the Lower Mainland ('off dock' trips).

129. The system was established in 2015 and is administered by the Office of the British Columbia Container Trucking Commissioner (OBCCTC). This issues licenses that allow trucking companies to operate in the port. To be licensed, trucking companies must prove compliance (so, 'off dock' trips by unlicensed companies would be possible, but logistically difficult). The OBCCTC has auditing powers and publishes its work.

130. The Port of Vancouver system sets rates that the licenced port trucking companies must pay to both contractor and employee drivers. In effect, these rates treat employees and contractors equivalently. Rates schedules have both trip and hourly rates and include fuel surcharges that trucking companies must pay to drivers. Rates derive from a formula for calculating the time a trip takes, the recovery of variable and fixed costs and, like in the Korean system, a fair rate of compensation. A GPS-based tracking system facilitates the calculation of both driving time and dwell time (waiting time).

131. As Canada allows independent contractors to have association rights to, non-employee drivers can negotiate collective agreements above the minimum rates.

132. There is an Industrial Advisory Committee, which includes freight owners, transport companies, port terminal operators, and drivers' unions. The Committee meets annually to discuss minimum rates, the licensing system, and working conditions. Rates can be raised through general consensus. However, they are generally set by the Commissioner after consultation. The Commissioner was granted the power to revise rates and fuel surcharges in 2019.

133. OBCCTC oversees regular monitoring and enforcement. Trucking companies seeking licences must pay a deposit of several hundred thousand Canadian dollars. The

Commissioner can claim against part or all of this if a trucking company is found to have underpaid or not paid a driver or a related fine. Fines can by levied for rates violations up to CAD 500,000. Fines can also be levied if trucking companies discriminate against drivers or demand unallowed fees. The Commissioner can suspend or cancel trucking licences.

3.6. California: distinguishing independent contractors and employee truck drivers

134. The Californian approach addresses the problem of employee misclassification. We focus here on the implications for truck drivers, but for completeness, at the end, address the situation for ride-hail ('platform') drivers, covered by the same recent legislation but the subject of a quite distinct political campaign.

(a) California truck drivers

135. As elsewhere, truck drivers in California have, to a significant extent, been transformed from employee drivers into contractors since economic deregulation in 1980; a large but unmeasured fraction of drivers provide their own trucks and fall outside the framework of employment.

136. In the US, truck drivers working in interstate and international commerce are not covered by the Fair Labor Standards Act of 1938, so there is no wage floor in the industry. There is no effective minimum wage regulation and no effective labour market regulation of maximum working time, although the U.S. Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA) administers technical regulations on work hours that define work in a narrow way that enables drivers to work excessive hours. Perhaps one third of all truck drivers in the US since deregulation of trucking, which started 45 years ago, have been required to purchase trucks in order to work and this has placed them outside the workers' compensation system, made them ineligible for union representation, and forced them to pay trucking firms' main cost of operation, including capital cost, fuel, licensing, maintenance and repair, wages, health insurance, retirement, and employment taxes. Probably between 80% and 90% of these drivers are dependent contractors and do not genuinely operate as independent businesses.

137. Finally, pervasive subcontracting, which leaves truck drivers entirely exposed to both business and employment risk, is associated with the likelihood that these workers and their families fall into poverty as they age. California realized that the breakdown of the employment system deprives the State of taxes needed to fund State programs and has made a years-long effort to resolve this. Truck drivers are paid piecework, typically by the load or trip, often dependent on freight revenue and swings in the business cycle. They are only paid when making deliveries and pickups, and many are only paid when hauling revenue freight.

138. The largest seaports in the US are the Ports of Los Angeles and Long Beach, handling about 16 million twenty-foot equivalent units (TEUs) of container freight every year. The misclassification problem is greatest for drayage drivers in the ports, which

drives a significant fraction of the state's transport economy, so it is a major concern in California. The campaign against misclassification has been waged for approximately two decades by the International Brotherhood of the Teamsters (IBT) and community coalitions such as the Los Angeles Alliance for a New Economy (LAANE). Initially this involved campaigning for employee status through legislation, but this approach had limited success.

139. Two pieces of legislation, Senate Bills SB1402 and SB338, sought to create disincentives to misclassification through the private economic power of firms at the top of the contractual chain. That is, they sought to establish incentives for freight owners to put in place rules and practices that would better align their private objectives and broader social objectives. Together these laws created a system of joint and several liability through revision of the Labour Code (adding Section 2810.4). This created a 'blacklist' of trucking companies that had misclassified workers and avoided paying wages. Beneficial freight owners that contracted with these non-compliant companies could be held liable for back wages and compensation. This has had some deterrent effect. Fear of losing customers prompted some trucking companies that had misclassified workers to pay wage claims. The system has not, however, led to actual liability for freight owners, and hence has not led freight owners to use their private economic power to stop trucking companies from misclassifying truck drivers.

140. The IBT and LAANE also attempted to mount legal challenges to misclassification alongside on-the-ground organising and industrial action. Through this, several thousand port drivers were deemed employees and won substantial amounts in back pay and compensation for illegal deductions. These successes, however, have not prevented misclassification in the majority of the sector.

141. The definition of "employee" and issues around the propriety of subcontracting have led to a long period of institutional instability, with negative consequences for the truck driver labour market. Historically, California (and other states) had adopted a complex standard (the 'Borello Test') following federal law that used multiple complex rules of control and independence to define independent contractors.

142. This has led to extensive litigation across the US, as the fact-basis for these disputes is likewise intensive. A California Supreme Court decision, known as *Dynamex*, finally rejected this complex test as unworkable in favour of the 'ABC' test (a 'presumption of employment'), in which a worker was assumed to be an employee unless the firm proved all of three criteria: the worker is free from direction and control; the work is performed away from employer premises; and the worker is customarily engaged in a similar but independently established occupation or business (Dynamex Operations West, Inc. v. Superior Court, discussed in Kun & Sullivan, 2018; Lebowitz, 2018).

143. The California Trucking Association with two purported owner-operators, and later the Owner Operator Independent Drivers Association, sued the State of California in the Federal Court to enjoin enforcement of the California Supreme Court decision based on pre-emption (states cannot pre-empt federal law). California lost at the

Federal 9th Circuit District Court but won in the Federal 9th Circuit Court of Appeals. The trucking industry appealed to the Supreme Court, which denied *certiori* (authority to intervene), so the injunction was lifted, and the State proceeded to implement. When the case was re-heard in the 9th Circuit, the judge ruled unambiguously for the California Attorney General (Bonta et al. v California Trucking Association et al., 2024).

144. While plaintiffs have again appealed, the law remains in effect and has been implemented. Owner-drivers may be treated by companies as independent contractors only under the narrow ABC test framework; they must be truly independent businesses. Notably, the Court may have implicitly adopted a double win solution for the workers: owner-drivers in California must be employees (unless the trucking company's operation meets the ABC test) but they can lease their trucks to the trucking company, as an independent business, and collect both a cheque for driver compensation and a cheque for the truck lease, letting them have it both ways (Belzer, 2024 forthcoming).

(b) California digital platform workers

145. A somewhat confounding development in the AB5 saga involves the distinction between applicability of the law to software-platform-driven work in unlicensed and unregulated ride-hail services (Uber and Lyft) and last-mile food delivery by companies like Door Dash. Although AB5 originally was supposed to apply to all transport workers, Uber, Lyft, and Door Dash turned to political action to eliminate the applicability of AB5 to these kinds of companies. They spent $200 million on a referendum campaign (for 'Proposition 22') and received 58% of the vote (and won by a 19% margin in the San Francisco Bay area—home to these Silicon Valley companies). This carve-out limits the applicability of AB5 to truck drivers, but expect to see litigation and organizing continue (Conger, 2020; Murphy, 2020).

146. Plaintiffs representing a class of gig workers working for the foregoing companies filed a class action demanding that California enforce AB5 for platform workers and argued that Proposition 22 was unconstitutional. They initially won their case at the California Court of Appeals (Gedye, 2023) but lost the case at the California Supreme Court in July 2024 (Sumagaysay, 2024; see Decision in Castellanos v. State of California, 2024). Some observers anticipate the Service Employees International Union, representing the gig workers, to seek Review from the California Supreme Court. Regardless, the workers demanding employment status will continue to press their case with the public, so we can expect this legal and political dispute to continue.

3.7. Europe: Three approaches to public and private supply chain regulation

147. Trucking in Europe has been influenced over several decades by the overall "freedom of movement" value that has allowed trucking companies to move their operational headquarters to the most favourable location and hire truck drivers and operate their trucks from anywhere within the European Union (EU). This has led to wide disparities in truck driver remuneration across the numerous member states. That

disparity is easily an order of magnitude difference in remuneration between truck drivers in the original Western European member states and drivers from the newer Eastern European entrants (Belzer and Thornquist, 2021), and it has seen significant employment dislocation across member states.

148. Europe shows the varied application of three models that utilise the importance of contractual chains. The first is a formal procedure for pursuing 'chain liability' for unpaid wages — holding firms up the contractual chain accountable specifically for unpaid wages below. This is being used most intensively in the Netherlands and Germany. The second is to establish legal accountability by the top firms for human rights violations below, by using the law to pressure firms at the top to exercise due diligence within their contractual chains. This is a model being pursued in France, while in Germany the Act on Corporate Due Diligence in Supply Chains is also now being applied in road transport. The third also invokes this 'due diligence' concept, but instead of relying on state-driven legal obligations, it attempts to make firms agree to pursue due diligence down the chain — in effect, to use a form of bargaining with lead firms to drive action below them in the contractual chain.

149. In short, these are various attempts to manipulate the regulatory power of apex firms — those at the top of a contractual chain — to eradicate illegal cost-cutting practices in their contractual chains, by emphasising the legal or moral accountability for such violations. These concepts are explored in more detail that follows.

150. These are not the only initiatives relevant to Europe. Others include the establishment of the European Labour Authority (ELA) and the adoption of the Mobility Package 1 by the European Parliament in July 2020. However, a major obstacle is the lack of political will for enforcement among many member states. In addition, there are enormous practical and systemic obstacles to establishing European-wide minimum standards. We focus on the three supply chain models below.

(a) The EU Enforcement Directive and chain liability in the Netherlands

151. EU Directive 2014/67/EU (commonly known as the Enforcement Directive, 2014) provides a clear basis for holding freight owners who contract for road transport services liable for unpaid wages that result from violations of rules on minimum rates of pay. The way this directive has been transposed into national law differs among EU member states. In the Netherlands both the Civil Code (Book 7, Article 616a – e), introduced in 2015, and the Labour Market Fraud Act, which was applied to road transport in 2016, create a redress process for a worker who has not received wages due to them. They can make a claim against the company that contracted directly with their employer and then follow, up the chain, to the apex firms at the top. This form of legal liability is known as 'chain liability'. Unlike the Enforcement Directive, the Dutch law applies to both workers posted in the Netherlands from another country (for example, through labour hire firms) and to Dutch nationals.

152. On several occasions, the Federation of Dutch Trade Unions (Federatie Nederlandse Vakbeweging or FNV) has used the chain liability process to win compensation for subcontracted workers in the transport and other sectors, though their usefulness may be limited by uncertainty for those initiating claims and the time it takes to progress them.

(b) Legal frameworks for mandatory human rights due diligence

153. The concept of mandatory human rights due diligence creates obligations on large companies to identify, prevent, mitigate, and account for negative human rights impacts linked to their businesses and contractual chains. This obligation persists even if they have not contributed to these impacts. The French Corporate Duty of Vigilance Law puts direct obligations on very large companies (termed 'relevant undertakings'), defined as those with over 5000 employees in France or over 10,000 globally, employed either directly or through subsidiaries. Covered firms must establish, execute and publish the outcomes from vigilance plans.

154. The German Supply Chain Due Diligence Act (LkSG), which came into effect in 2023 with wider coverage from 2024, appears stronger. It affects firms with (in 2024) at least 1000 employees in Germany. It covers 'all products and services of an enterprise and all steps in Germany and abroad that are necessary to produce the products and provide the services' (ver.di, 2024), and requires these apex firms to undertake risk assessments, put in place preventative measures, take remedial actions and establish complaints procedures. They are also required to undertake monitoring and reporting activities, while certain roles are also given to Works Councils and Supervisory Boards (which include employee representatives). Human rights matters encompassed by the LkSG are very broad, and include minimum working age, child labour, forced labour, slavery, health and safety, freedom of association, discrimination, fair remuneration, harmful environmental changes, unlawful taking of land, forests and waters, and use security forces that use excessive violence.

155. A very recent development is the European Union adopting its Corporate Sustainability Due Diligence Directive (CSDDD) in 2024. This applies to very large firms (with over 1000 employees and turnover over €450 million) and sets rules for the operations of target companies, their subsidiaries and 'business partners in the companies' chains of activities', but with limited application to downstream firms. There are penalties for firms that fail to develop preventive and corrective action plans, but narrow civil liability provisions. Vogt, Subasinghe, and Danquah (2024) point to the criticality of 'member states tak[ing] advantage of the flexibility allowed to create stronger rules' when the CSDDD is transposed 'into national law'.

(c) Due Diligence Foundation

156. A third approach in Europe is the Road Transport Due Diligence (RTDD) Model, developed by Stichting VNB (the research and enforcement arm of FNV) and two Global Union Federations (GUFs), the International Transport Federation and the International

Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Associations. These bodies established the Stichting (Foundation) RTDD in the Netherlands in 2021.

157. The goal of the RTDD model is to win commitments from a critical mass of freight owners within a specific sector to a set of human and labour rights standards and to monitor the compliance of their transport suppliers. The RTDD Foundation operates within the context of the environment created by the increasing body of mandatory human rights due diligence and chain liability laws in Europe, but it does not rely on them for enforcement. Instead of relying on state action, it relies on agreement-making between the RTDD Foundation and large companies. If non-compliance is found, the freight owner commits to carry out remedy plans in consultation with the trade unions involved.

3.8. Port Botany Logistics

158. Later in this report, we point to the significance of the remuneration of 'dwell time' or non-driving time in shaping driver and client behaviour. Suffice it to say at this stage that if drivers are not remunerated for non-driving time, drivers face an incentive to cut corners to make up for income losses, while the organisations that deploy them have no incentive to cut down non-driving time or promote efficiencies that would reduce it. The consequences can be increased fatigue, more risk-taking and worse safety outcomes.

159. This report gives a primary focus to matters and policies that *directly* affect the relationship between the firm and the driver, including such matters as compensation and conditions. However, policies and procedures can have an *indirect* effect on these relations, including on payment for non-driving time. A local example of this is provided by Port Botany in Sydney.

160. Port Botany is the major container terminal in Australia's largest city. It is located only 13km from the central business district and so has a significant influence on traffic in and around the city. It was typified by long queues of trucks, which could leave drivers waiting for hours to obtain their loads. For long-distance trips these waits could turn a tiring journey into a truly exhausting one. This very problematic situation was transformed a decade ago when the statutory corporation managing the container facility, Sydney Ports, implemented the Port Botany Landside Improvement Strategy (PBLIS).

161. The key feature of the PBLIS is the introduction of an advanced system of scheduling and demurrage, the most important feature of which was the imposition of a system of penalties for vehicles being on-site outside the scheduled times. These penalties were imposed on key buyers in the relevant intermodal transport contractual chains, including road carrier businesses and stevedores (Transport NSW, 2012). Because these firms now face penalties, they have an incentive to ensure that trucks only arrive on time to collect (or deposit) a delivery, instead of sending drivers off to the

port knowing that they would eventually be able to do so, with little regard for the waiting time involved. Essentially, the system was a new form of regulating RT contract networks, by requiring greater co-ordination amongst consignors, consignees, the RT industry and others (Nossar & Amoresano, 2019). Port Botany described itself as the 'only container port in Australia with a regulated truck booking and penalty system, delivering world class truck turn-around times along with savings for importers and exporters' (NSW Ports, 2024).

162. The new booking and penalty system significantly reduced truck turnaround times and peak hour congestion. It increased the number of trucks arriving on time (Nossar & Amoresano, 2019). This had two main consequences. First, efficiency in the port increased. Second, driver fatigue declined, due to the fall in unpaid non-driving time. The key point from this is that indirect regulation of unpaid working time, through procedures that may otherwise be seen at simply increasing efficiency, can deliver improvements in safety through reductions in fatigue. This has the potential for application in a number of sectors. For reasons of space that is not explored further in this report, but we do consider later the core issue of payment for non-driving time.

3.9. Comparisons with Australia's 'Closing Loopholes' approach

163. The experiments described above show many similarities and differences in the approaches taken to respond to the problem of road freight transport. All those experiments sought to act on the acknowledged fact that the issues with remuneration and conditions in the industry could not be addressed simply by direct regulation within the existing employment relationship. All recognised the relevance of the contractual chains and sought a variety of approaches to dealing with that central feature of the road freight transport industry.

164. Perhaps of central significance is: how do these approaches compare to the 'Closing Loopholes' approach in Australia, summarised in paragraphs 106 to 109 of this report? What lessons can they tell us about the paths to success for the 'Closing Loopholes' approach?

165. The 'Closing Loopholes' legislation establishes a power for a state agency to directly regulate the payments to drivers of road freight vehicles. This power is something that was also utilised in the Korean 'safe rates' legislation, and in also embodied in the approaches taken in Brazil and the Port of Vancouver.

166. In Brazil, a limitation was that the system could only provide, in effect, for reimbursement of costs experienced by drivers. In Korea and Vancouver, though, the rates determined through the process could also take account of the need for an appropriate income for the drivers. Australia's 'Closing Loopholes' approach also allows an appropriate income to be taken into account in the setting of rates.

167. Indeed, the Act requires that the FWC take into account 'the need for an appropriate safety net of minimum standards' and have regard to 'the perspectives of

regulated workers, including their skills, the value of the work they perform'. It must 'take into account safety net minimum standards that apply to employees performing comparable work' as well as the 'costs necessarily incurred by regulated workers'. The FWC is told not to give preference to one business model over another (i.e. employment or contracting relationships). The practical effect is that the 'Closing Loopholes' approach is designed to enable equivalent minimum standards for employees and contractors after allowance is made for the inherent differences between contractors and employees. In that sense, it has similarities to the Vancouver system, where the minimum rates treat employees and contractors equivalently.

168. In Korea, Brazil and Vancouver the focus was on regulating outside the employment relationship: on setting conditions that applied to contractual, not employment, relationships. In Europe, as well, the approaches examined seek to regulate the contractual relationship between freight owners and transport employers, although the protections ultimately cover only employee drivers. (It should be noted that unlike in other regions, in Europe the overwhelming majority of long-distance truck drivers are classified as employees). The 'Closing Loopholes' approach is similar to the models in Korea, Brazil and Vancouver in this regard, as it, like these systems, does not attempt to turn contractors into employees (though, separately, it does make it easier for some workers to be classed as employees rather than contractors).

169. The California approach is the exception, as it sets a framework for redefining workers who would otherwise be defined as contractors back into employees. It changes the likely employment status of a large fraction of truck drivers in California. While this was unusual in terms of the countries listed above, it has been the approach commonly sought in many other countries and in many jurisdictions in relation to platform workers specifically, as opposed to truck owner drivers. In that respect, the approach has had mixed results: sometimes, attempts through the relevant tribunals and courts in various countries to have gig workers recognised as employees, not contractors, have succeeded (Gall, 2016; Grierson & Davies, 2017), and sometimes they have failed (Butler, 2017; Hanley, 2017),[4] leaving those workers with no residual protection. While another part of the 'Closing Loopholes' legislation does make it easier for contractors to be properly defined as employees, this is just a reversion to the situation that existed a few years ago (before two High Court decisions). The provisions discussed here specifically relating to road transport workers do not permit the FWC to convert workers already recognised as 'employee like' into conventional employees.

170. The other thing that is notable about the California approach is the huge political opposition it engendered. Hundreds of millions of dollars appear to have been spent in campaigning against the reforms — though this campaign affected digital platform workers, not truck drivers. Still, this capacity for political mobilisation is likely something that has chilled the prospects for further reform along these lines in many countries.

[4] See also Razak v. Uber Technologies Inc., U.S. District Court for the Eastern District of Pennsylvania, Case No. 2:16-cv-00573, p25; Kaseris v Rasier Pacific V.O.F [2017] FWC 6610 (21 December 2017); Pallage v Rasier Pacific [2018] FWC 2579 (11 May 2018).

171. The various approaches taken in Europe give primacy to the contractual chain itself. The first two described above ('chain liability' and 'due diligence in human rights' responsibilities) make use of state regulation of the contractual chain, with the focus on the legal responsibilities of the freight owners, the firm at the top of the contractual chain. In the other jurisdictions covered in this chapter, the role of the contractual chain and freight owners is still relevant (in that a firm higher up the supply hierarchy can be made to pay the relevant rates, or in California's case to pay someone as if they are an employee). However, in those jurisdictions the transaction (the payment for the delivery of goods) is being directly set by the state agency. In the European cases, firms higher up the contractual chain can be held accountable for matters over which, one could imagine, they would like to claim they had no control; yet the state is asserting that, by virtue of their role in the contractual chain, they *do* have control, or at least the *potential* to control what happens lower down the contractual chain. They are being held vicariously liable for the behaviour of entities below them in the contractual chain, much like Australia's Fair Work Act has already done in relation to franchises and holding companies since the passage of amendments in 2017, referred to in paragraph 107 above, concerning employee entitlements within hierarchical structures associated with franchise operations or holding companies.

172. Crucially, the 'Closing Loopholes' amendments to the Fair Work Act allow the FWC to make orders affecting a 'contractual chain' in the road transport industry.

173. The third European model discussed above, the 'road transport due diligence' model, relies not so much on state regulation of the contractual chain as on the capacity for private regulation of it by freight owners. It is based around the idea that worker bodies (in this case, the RTDD Foundation) can make agreements with those freight owners at the top of the contractual chain, and that those freight owners will use their market power to ensure that firms lower down the contractual chain adhere to the minimum standards set out in the agreement (which here concern human and labour rights). This is a model that several GUFs have been pursuing with large multinational corporations, most prominently in 'Bangladesh Accord'. This was an agreement between large, multi-national (mostly European) clothing brands and retailers and industry GUFs requiring those peak firms to regulate the safety of independently owned factories producing clothing for them in Bangladesh. It was negotiated following the collapse of the Rana Plaza building that led to the deaths of over 1000 Bangladeshi factory workers (Reinecke & Donaghey, 2015a, 2015b), and took advantage of the reputational damage that could flow to firms who profited from poor safety in their contractual chains. While agreements with apex firms are obviously something that no legislation can force, the 'Closing Loopholes' amendments do allow for the recognition and enforcement of such contractual chain agreements, if they occur in Australia.

174. The Port Botany model is mostly different from all of the above, focusing as it does on the indirect regulation of dwell time by a third-party organisation. Unlike in the European examples, the contractual chain is not being used to channel regulation. As in the other examples, a state agency (the port corporation) is imposing a regulation, but it is not directly regulating conditions of work; instead it is imposing a penalty regime that

affects the incentives facing, and the behaviour of, the freight owner. The form of scheduling regulation that Port Botany manages is not a form of regulation directly available to the FWC under the 'Closing Loopholes' amendments, as the FWC does not manage ports or other transport facilities. However, the existence of this regulation reminds us that there are additional ways to influence the behaviour of freight owners that go beyond the level of payments for trips. The regulation imposed by Port Botany has similarities to the Brazilian and former Korean arrangements that impose additional fees that freight owners must pay if the time for loading and unloading a vehicle exceeds a specified maximum. In that context, it is noteworthy that the 'Closing Loopholes' amendments preclude the FWC from including 'rostering arrangements' within a minimum standards order (in s 536KM of the FW Act), and this might constrain the FWC from seeking to indirectly regulate dwell time, though the provision that a minimum standards order is not limited to only covering matters explicitly listed (in s 536KL) may have the opposite effect.

175. The coverage of regulation within a jurisdiction varied. In Korea, the laws had national effect, and in California they applied state-wide, but the Vancouver regulations only directly covered firms that used the port or operated essentially within a metropolitan area. Hence unlicensed companies that did not meet the remuneration standards could still operate in and outside Vancouver, provided they did not use the port. Indeed, they could theoretically take goods, that had arrived in the port, outside of Vancouver provided a licensed firm delivered it to them, though there would be logistical issues in that.

176. In Korea, the biggest problem for effective regulation was the effect of the sunset clause in the legislation. This had been inserted as a compromise to get the system introduced in the first place, but ultimately proved fatal to it. There is no such provision in the Fair Work Act regarding the 'Closing Loopholes' amendments, merely a requirement for review.

177. In California, a different problem — of political sustainability — was introduced through the political campaign waged against reforms by the gig firms who stood to lose the most from them — but this did not extend to the road freight reforms, which were unscathed by the gig firms' campaign. Political sustainability was clearly also a problem that did affect road freight through the fate of the RSRT in Australia, but it is a problem that the NSW reforms through chapter 6 of the Industrial Relations Act (discussed in paragraphs 98 and 99 above) avoided.

178. One characteristic of the NSW legislation, and indeed of many of the systems described in this chapter (but especially those in Vancouver and Brazil), is a high degree of consultation with affected parties. This is very much institutionalised within the Closing Loopholes' model, which specifies the establishment of a Road Transport Advisory group, and prevents certain decisions being made without the prior involvement of that Advisory Group. This appears to be a reaction to a perceived weakness of the RSRT in relation to consultation and makes the 'Closing Loopholes' approach one of the more consultative in the world in this area.

3.10. Conclusions

179. While the employed component in the road freight transport sector is often regulated, the contractor segment, near the bottom of the contractual chain, has historically been mostly unregulated — except in New South Wales. There is thus an important regulatory difference between NSW and the rest of Australia.

180. In the context of the issues described in the first chapter, there have been various attempts to regulate outside the employment relationship, to mitigate or overcome these problems. While Victoria and Western Australia passed laws that sought to have some marginal influence on business practices, by far the most significant example in Australia has been the Chapter 6 provisions of the NSW Industrial Relations Act, which enable an industrial tribunal to set minimum standards for payments and conditions in the industry, and also provide some facilitation for bargaining between industrial parties. This legislation is in its fourth decade of life, having survived several changes of government. Research into its effects (Peetz, 2022)demonstrated a substantial long-term reduction in road deaths (estimated as being over 200 lives saved), but also showed a substantial short-term variation in road deaths (as they have many causes), making short-term evaluations of legislative change nearly impossible.

181. At the federal level, in Australia, the Road Safety Remuneration Tribunal was legislated into and out of existence before its effects could be properly or even tentatively evaluated. Most recently, the *Closing Loopholes No 2 Act* has given the Fair Work Commission the same powers to deal with remuneration in the industry as have been given its NSW equivalent, plus some more to deal with contractual chain issues that the NSW tribunal has not had.

182. There are also international examples of attempts to regulate outside the employment relationship in this industry — in Korea, Canada, Brazil, the United States and Europe — and these have been considered, along with another form of regulation specific to the Port Botany container terminal, as it highlights the variety of approaches that are possible.

183. Overall, the experiences from other countries described in this chapter point to several lessons from overseas, including the desirability of:

- enabling bargaining or regulation outside the employment relationship, including on matters concerning remuneration of drivers, but also ensuring that workers who are genuinely employees are treated at law as if they are employees;
- enabling the relevant agency to take account of the need for drivers to earn a reasonable income, and not just recover their costs;
- encouraging the minimum standards for employees and contractors to be broadly equivalent in value, and so not giving preference to one business model over the other;

- having the capacity to regulate the contractual chain as a whole, in particular the role of freight owners, and not just the firms that directly engage drivers, enabling the freight owners to be held accountable for what happens in the contractual chain;
- enabling regulation to cover all participants in an industry in a jurisdiction, not just those who operate within a limited geographic area within that jurisdiction;
- recognising and giving legal force to agreements between unions and contractual chain participants, including freight owners;
- focusing on arrangements that have long-term sustainability and certainty, through entrenching a high level of consultation and avoiding sunset clauses;
- enabling indirect regulation of 'dwell time' and other factors that may be influenced by the behaviour of freight owners.

The Closing Loopholes legislation is consistent with the first seven of those eight lessons. Its only weakness, when seen in international context, is in relation to the final point above: the exclusion of some matters that could otherwise be important in influencing freight owner behaviour, particularly the regulation of overtime and rostering. Accordingly, the 'Closing Loopholes' approach is overall the most advanced legislation internationally in dealing innovatively with regulation beyond the employment relationship as it affects remuneration and hence safety and efficiency in the road freight transport sector.

4. Can we quantify different types of effects of road transport regulation outside the employment relationship?

4.1. Introduction

184. This chapter outlines the steps involved in estimating the price effects of road transport regulation (RTR) outside the employment relationship. (Chapter two already drew attention to some limitations in present data, suggesting that some relevant data are not presently available to complete an estimation of the full effects.) This chapter also refers to the steps necessary to estimate the non-price effects.

185. An appendix to this report (Appendix 10.1) expresses some steps towards a model in mathematical form but non-availability of data means we do not elaborate on it complete it.

186. The total or social effects of any event — a transaction or a regulation — can be broken down into private effects and public effects. The private effects are those that apply only to the parties to a transaction. Public effects are referred to as externalities. These are costs or benefits that are borne not by the parties to a transaction but by others in society. In this chapter we conceptualise private and public effects, and discuss aspects of methods of estimating price and non-price effects.

4.2. Conceptualising private effects

187. In the case of a contract to transport an item from A to B, the *private* effects are typically the financial cost to the purchaser (the freight owner, or client), the income received by the provider (the trucking company or the truck driver), and the additional costs incurred by the provider as a result of the transaction (fuel, depreciation, his or her labour time, etc).

188. There may be some other private effects that are experienced as costs by the provider but may or may not be built into the calculus for the transaction. These could include impacts on fatigue, inter-personal relations, drug taking and the like.

189. Some of the private effects of regulation are symmetrical: a gain in income achieved by a beneficiary of regulation has a match: a loss of income of an equivalent amount by the other party to the transaction. This income transfer itself is thus a zero-sum effect, and wholly distributional.

190. Other private effects may not be of a zero-sum quality. Some may affect both, parties but not in that symmetrical, zero-sum manner. Some may affect one party but not the other, or at least affect them differentially.

191. For example, the 'efficiency wage' literature, discussed in chapter 6, suggests that the income transfer need not have solely distributional effects. Higher labour (driver) incomes might not only benefit the driver, but also the firm using that labour, by reducing other costs or increasing productivity. On the other hand, standard neoclassical theory suggests that higher labour incomes may lead to less use of labour, that is, a fall in employment. The extent to which this is true, however, depends on complex economic interactions, and ample research refutes this proposition in many markets.

192. As another example, regulation might affect the behavioural incentives facing drivers, leading to health and safety outcomes that have their own costs or benefits. In particular, low labour incomes might encourage risk-taking behaviour that leads to poor outcomes in terms of illness, injury or death to the drivers themselves. They may also affect other road users, which is often a major reason for public interest in the issue of road transport regulation, discussed below.

4.3. Conceptualising public effects

193. *Public* effects include things like congestion, pollution, wear and tear on roads, and the like. For example, if a truck transporting goods from A to B is involved in a road accident, then the health costs are often a mix of private and public effects. Injuries to the driver are experienced by a party to the transaction; but the costs of healing those injuries, to the extent that they are only partially paid for by the carrier (the trucking company or driver), are public costs. The full costs of any injuries to third parties or bystanders are entirely externalities unless they are fully paid for by private insurance paid by the trucking company transporting the freight. Property damage is a mixture of public and private, depending on who owns the damaged property.

194. There might also be effects on the efficient allocation of resources, which broadly speaking means that resources being used are priced at their social value. Efficient resource allocation in turn requires that the pricing of those resources reflects social norms regarding the value of labour resources, taking into account the social value of all the externalities concerned (health and safety costs, congestion, carbon emissions, road construction and maintenance and so on). If a resource is overused because of being under-priced because externalities have not been into account, and this leads to excess externalities such as carbon emissions, congestion or road decay, then public welfare is reduced.

195. However, under-pricing is not the only issue; so, too, is potential over-pricing. Consumer welfare declines if prices rise without offsetting increases in incomes. If an increasing proportion of income is spent on transport costs, consumers have less to spend on other goods or services and so their welfare is diminished.

196. Governments sometimes seek to use taxation, licensing fees or other charges to account for some public costs. Thus, it is popularly thought that petrol and diesel taxes are used for road construction and the higher charges paid by larger vehicles offset their

greater contribution to the need for road maintenance. In reality, this is not the case in Australia: petrol and diesel taxes are not hypothecated to road construction and maintenance, and they instead simply contribute to consolidated revenue (which includes revenue from income taxes, company tax and consumption taxes, amongst many other sources). Road construction and maintenance, in turn, is financed out of consolidated revenue by the federal and state governments. That said, the net effect of those factors is complicated to assess and beyond the scope of this report. We will not be exploring the issue of road construction and maintenance, or other issues concerning road use such as congestion taxes, in any more depth in this report.

197. One public effect that is worth mentioning, though, is that on price levels and inflation. Inflation has economy-wide consequences, so if transport regulation would lead to a significant increase in inflation, that is an effect deserving of attention. Welfare declines if the value of wealth holdings is reduced by excessive inflation. In the light of this, and the previously mentioned loss in welfare if an increasing proportion of income is spent on transport costs, the next chapter considers, *inter alia*, the impact of transport regulation on prices.

4.4. How can we estimate the price effects of regulation?

198. The process below outlines a conceptual framework for estimating the price effects of RTR, if we had perfect access to information.

199. Overall, the net costs or benefits of RTR consist of the financial or private costs or benefits plus the public benefits or costs. In theory, these private financial costs are equal to the direct private financial costs to firms (sellers) plus the direct private financial costs to workers. However, this is really a transfer of income, so a cost to one is a gain to the other. Nonetheless, for analysis of prices, the direct private financial costs to firms is relevant.

200. The private financial costs to firms can be conceived of as the percentage increase in prices minus percentage increase in productivity and minus any net reductions in other costs, all multiplied by the prior dollar value of affected production. Productivity gains and cost savings — for example, through reduced day-to-day wear and tear on trucks (from them not being driven into the ground) — are discussed in more detail in a later chapter.

201. The increase in prices would be equal to that increase in costs multiplied by the proportionate pass-through of cost increase into prices. That increase in costs in turn is a function of the percentage labour income 'uplift' multiplied by the share of labour in total costs. 'Labour income' is used here to refer to the 'wage' component of the income received by owner-drivers or contractors, though we cannot call it a 'wage' because they are not employees. The term labour income 'uplift' refers to the increase in labour income necessary to bring minimum contractor and owner-driver incomes up to the minimum rate for employees as set out in awards. It is what might be called the 'wage gap' between employee labour and the labour of contractors and owner-drivers.

202. That 'labour cost uplift' would be assumed for the purposes of this exercise to be the difference between the award rate and the actual labour income rate amongst owner-drivers and contractors. As we will see, this is an area where there is almost no information on the basis of which informed estimates could be made. Aside from the well-documented claims of firms with employment models being undercut by various firms using contractors or owner-drivers, we have no systematic quantified data on the matter.

203. To make an estimate of the costs to the industry, and the economy, we would also need to multiply this by the number of affected contractors and owner-drivers. As will be seen, we can make reasonable estimates of the number of these in the sector. However, we do not know how many are earning above, and below, any minimums that could be set through the RTR process. Moreover, this information is almost unattainable.

204. As for the increase in productivity mentioned above, it can be thought of as the 'elasticity of productivity with respect to wages' (the percentage change in productivity associated with a 1% increase in wages), as multiplied by the labour cost uplift. As we shall see below, there is good reason to believe that productivity increases when higher wages are paid. But the exact size of this increase — and therefore the 'elasticity of productivity with respect to wages' — has not been convincingly quantified.

205. There are also the cost savings, as mentioned above, that need to be taken into account. However, this must also include the gains to the firm from the reduced costs of health and safety associated with RTR. Yet the savings to the firm are less than the total savings from a better health and safety performance, much of which are secured by the driver (who remains uninjured or even above) and society as a whole (which has fewer hospital bills to finance).

4.5. How can we estimate the non-price effects of regulation?

206. We now turn to the material needed to estimate the non-price effects of regulation, in a situation of perfect information.

(a) Health and safety

207. Chief among the non-price effects, for the purposes of this report, are the safety effects. To estimate this, we would need to know: what is the 'value' of safety; and what is the 'elasticity of safety with respect to wages' (that is, by *how much* does safety increase when labour incomes increase). These would then need to be applied to the labour income uplift, discussed earlier.

208. Some studies attempt to estimate the value of a human life, or the cost of a fatal accident, and workers compensation systems attempt to estimate the value of certain types of injuries to the workers who suffer them. Some of those studies, in relation to

road transport, are discussed later in this report (chapter 7). However, not much is known about the 'elasticity of safety with respect to wages' within Australia. To anticipate later chapters: we know that higher labour income leads to substantially better safety outcomes, but we don't know by how much.

209. To properly estimate the public costs of accidents, we would have to also incorporate the effects on families, first responders and bystanders.

(b) Labour shortages and employment

210. Labour shortages are not easy to assess. When Jobs and Skills Australia assesses labour shortages it examines a range of quantitative data (numbers of vacancies, the 'fill rates' for positions advertised, prospective demand, etc) but also undertakes qualitative analysis — holding interviews and focus groups with stakeholders from various industries. With limited resources, it cannot give the same thorough assessment for every industry. In the end, it publishes not a number representing something like the fill rate, but instead a subjective, dichotomous 'shortage'/'not shortage' (S/NS) rating, which it publishes for most occupations for each state plus nationally. The components of this S/NS rating are not published, mostly to avoid misuse of statistics like the fill rate by those with either insufficient understanding or an excessive agenda to push. So, while the difficulties with labour shortage data are partly related to the limited amount of data published, they are also tied to the inherent difficulties in assessing this subjective matter.

211. Related to labour shortages are issues of employment. The standard neoclassical model suggests that any exogenous increase in labour incomes leads to a reduction in employment of that labour. This would apply to owner-drivers as much as employees. Yet more recent developments in the theory of monopsony would suggest otherwise: in circumstances where employers exercise discretion over labour incomes (instead of just being price takers), they may choose to pay wages at a rate which leads to labour shortages, and so an exogenous increase in wages might even lead to increased employment and reduced labour shortages (as well as increased productivity and firm profitability (Faulkner and Belzer, 2019), fewer work hours (Belzer and Sedo, 2018), and fewer crashes and lower crash cost (Belzer et al., 2002, *inter alia*)). We return to these issues later.

(c) Allocation of resources

212. An important question can be the extent to which regulation is promoting an efficient or inefficient allocation of resources. The effects of under-pricing or over-pricing of inputs have been briefly canvassed earlier in this chapter and are discussed in more detail in chapter 8. In conventional economic theory, an optimal allocation of labour occurs when the price of labour reflects the marginal productivity of labour, and the marginal productivity of labour reflects the private and social costs.

213. The impact on the allocation of resources can affect not just measured economic welfare but also the time taken for travel (if changes in transport usage affect congestion), air pollution and carbon emissions (if they affect distances travelled by certain modes of transport).

214. Sometimes, large and complicated general equilibrium models of the economy are used to estimate the national gains (or losses) from a more (or less) efficient allocation of resources, underpinned by numerous questionable assumptions about economic relationships. Short of such a model — which would be contestable anyway — it is difficult to estimate the net value to society of a more efficient allocation of resources, and we do not attempt it here, though we do make observations about the effects on efficiency where relevant.

4.6. Pass-through of cost increases (particularly wage increases) to prices.

215. We are not aware of studies examining the impact of transport costs on inflation. For the analysis below, we assume 100% pass-through, to examine worst case scenarios.

216. Given earlier data, using the ABS input-output tables we estimate labour costs are 26% of the final value of Australian production in the road transport industry. The implication is that if wages increased by, say, 10% and that was fully passed on by the industry, road transport prices would increase by 2.6%. If that is fully passed on in turn, a broad measure of inflation, the GDP deflator, is likely to increase by just 0.08%—not quite a tenth of one per cent.

217. However, the issue here is the remuneration of contractors. Using the ABS input/output data for mixed income and assuming those figures include all the income of contractors, then a 10% increase in contractor payments would increase final road transport prices by 0.71% and the GDP deflator by 0.02% on the similar reasoning as applied to wage increases.

218. Note that any price impact on other industries is likely to be very uneven. On average road transport is approximately 1% of the final price of products on average, but that increases to 8.9% for dairy product manufacturing, 7.7% for beer manufacturing, 13.1% for sawmill products, and 11.1% for cement products to give just some of the highest figures. To take the example of sawmill products: if road transport wages increased 10% and pushed transport costs up to 14.4% of the final price (13.1 + 1.3 = 14.4), then total sawmill product prices would increase by the difference, 1.3%, if fully passed on. The impact on consumers through such things as furniture prices would be further diluted because sawmill products make up just 11% of the final price of furniture.

219. By contrast the impact on services is trivial. The exceptions are the retail and wholesale industries that rely heavily on transport. The monopsony power of those businesses is likely to inhibit some of the pass-through from the road transport firms.

220. All of this suggests inflation consequences of increases in income in road transport have a very marginal impact on the price level.

221. As mentioned, the preceding discussion mostly assumes 100% pass-through of higher labour costs. In practice, pass-through is likely to be less than that, especially where there are tendencies to monopsony amongst the users of road freight transport. Empirical evidence suggests that pass-through of cost increases is less if only a small number of firms are affected in an industry than it is if all firms are affected (RBB Economics 2014). Any regulation of remuneration for contractors and owner-drivers, that matched their remuneration to that of employees, would inherently not affect all firms in the sector. Indeed, if all contractors and owner-drivers were earning below a social minimum, it would plausibly only directly affect less than a fifth of all truck drivers (based on the employment numbers cited earlier in section 2.2), though probably a higher proportion of truck drivers engaged in the road transport industry. (This would be because drivers classed as being in other industries would mostly be considered 'employees', since owner-drivers servicing those firms would still be themselves considered to be in the road transport industry.) In practice, the proportions are likely to be considerably less than this, because the limited income data discussed earlier suggested that a number of owner-drivers and contractors would be earning above the minimum anyway — with some earning well above that amount.

222. Moreover, the impact on prices of any implied pass-through of cost increases would have to be discounted by any improvements in productivity or offsetting cost reductions, as discussed later in this report.

4.7. The role of comparators

223. Evaluations of public policy typically involve some comparison: of 'before' with 'after', of 'treatment' with 'control' groups, or both. Studies may look at changes over time in some key outcome variables, and/or differences between groups.

224. The study comparing road deaths in heavy transport and other forms of road transport in NSW and the rest of Australia was cited earlier (Peetz, 2022). That study focused on one important private and public effect of road transport regulation: road safety. The time period for the study was over four decades (with 33 annual observations of the number of road deaths for each group — using data from 47,419 road crash fatalities). The 'treatment' group was heavy articulated vehicle transport in NSW, the control groups were other vehicles in NSW, and heavy articulated vehicle transport in other states. The analysis showed a significant difference between the 'treatment' and 'control' groups.

225. As mentioned, a notable aspect of that study was the substantial annual variation in the number of road deaths among all groups. From one year to the next, the absolute value of the change in NSW heavy vehicle road deaths was 21% up or down on the previous year's toll. When the underlying trend in that sector was for an annual decline of just 5% per year, about twice the size of the decline in the control groups, it clearly would take a considerable time for this trend, substantial as it was, to be separately discerned. This meant that it was only possible to evaluate the impact of the Chapter 6 model on road deaths after a long period of time. This has implications for the assessment of policy interventions in this space, in particular other interventions such as the Road Safety Remuneration Tribunal (RSRT). The RSRT only operated for a short time — too short for any proper evaluation of its impact to be made. This is most obviously the case in light of the substantial annual variation in the fatality rate from road accidents involving heavy vehicles. Those evaluations that were undertaken were commissioned with a political focus (to facilitate the abolition of the scheme) and had serious weaknesses that rendered them of little value (Belzer, 2016).

226. This tells us that assessments made of the impact of prior systems of regulation (i.e., other than the Closing Loopholes Act) would be very difficult if they relied on the RSRT, as it takes a long time for the resultant effects to be obvious in light of all the other influences on factors such as road safety. Long term comparisons between NSW and the rest of Australia are likely to be more productive, both because the NSW system is still operating (so data can still be collected — some relevant data might never have been collected during the RSRT period) and it has been in operation for long enough for effects to become observable.

227. Alternatively, research could focus on particular case studies, and drill down into what are thought to be the underlying causal relationships that would determine whether a policy is effective. They might investigate, for example, how various interventions shape driver behaviour, firm behaviour or safety or productivity outcomes, while needing to bear in mind the caveats already mentioned about the time it takes for some outcomes to be observable.

228. Further implications of this for future research design are discussed in the penultimate chapter.

4.8. Conclusions

229. In the end, to the question 'Can we quantify different types of effects of road transport regulation outside the employment relationship?', we must answer 'only partially'. We can discuss the direction of effects with far more confidence than we can the precise quantity of them.

230. One finding from the evidence in this chapter is that any inflation consequences of a future rise in income in road transport are likely to have a very small impact on the price level. As shall be explained later (paragraph 347), to the extent that higher

remuneration does put any upward pressure on *freight* prices, the latter would seem to be inefficiently low to begin with.

231. That said, it is apparent that the full data to estimate the impact of RTR are not presently available. While, on some matters, informed estimates can be made (such as the numbers of employee drivers versus non-employee drivers), on other matters the data do not presently exist, or are too unreliable to use. This particularly relates to the incomes of employee and non-employee drivers, the proportions of non-employee drivers who would be in receipt of labour incomes that are below the minimum that some RTR might determine.

232. Recall that the material in chapter 2 contributes to our preliminary attempts to investigate the availability of data to construct a model of the price effects of regulation. Price impacts embody the private effects of regulation on the client, but they then have a public dimension, as under-pricing, over-pricing and inflation all have social welfare consequences. It confirms that, while some important data are available, not all relevant data are presently available to complete the estimation of a general equilibrium model of price effects.

233. We can estimate the value of production in road transport, but we have limited information on the precise pass through of labour income rises into prices. Evidence provided later in this report will show that there are productivity gains from higher remuneration of truck drivers, and there are reductions in costs that at least partially offset the higher financial costs to firms from greater labour incomes, but the evidence does not really quantify these effects in a systematic basis.

234. We also know, from evidence presented later in this report, that there are health and safety gains from higher labour incomes, and these gains are shared between the firm, the driver and society at large. However, it would be brave to try to quantify those shares and the precise value of those gains to each party, for a variety of reasons starting with the fact that putting a financial value on human life is a pretty fraught exercise. Still, some studies cited in chapter 7 at least attempt to do the last of those things.

5. The Economics of Pay, Safety, and Health: Theory and Empirical Research

5.1. Introduction

235. This chapter considers the economic theory of pay, safety and health. It makes use of material from outside the road transport sector, providing the context for later material that is specifically about the road transport sector. While specific quantities vary among industries, economists generally think that what is theoretically understood and empirically verifiable in one industry is, to a first approximation, applicable to another. While empirical analysis varies by industry, economic theory does not.

236. The economic theory outlined in this chapter will be used as a basis to argue for the implementation of efficiency wages in the form of 'safe rates' and to argue for a rethinking of piece-rate compensation (payment per kilometre or per trip) — in particular, to show that it is important for safety and economic efficiency to explicitly pay truck drivers for their non-driving service to the employer. In addition, in the interest of labour market equity and efficiency, to at least ensure that the piece-rates that are used for non-employee drivers have the same value as the labour income received by employee drivers. This means that, in effect, non-employee drivers would be paid for both their driving and non-driving time, since employee drivers in Australia are typically paid for both driving and non-driving time if it occurs within their shift. This is because minimum rates of pay in the Road Transport and Distribution Award 2010 are expressed in hourly terms and working time is described in the Award as lasting over a continuous period. Economic theory suggests that increased compensation is a driving force in productivity, increased safety, and the resulting health outcomes of road transport workers.

5.2. Compensation and Productivity

237. In economics, the employer-employee relationship often is framed in terms of agency theory. In the standard principal agent model, the agent bears the disutility of work, and the principal captures the benefit. However, in practice, the principal often does not have perfect information about the agent's effort. This creates an opportunity for 'shirking', a situation in which an agent does not perform to the expected level of the principal. To prevent this, the principal's usual options are to adjust the level of compensation, attach it to performance, or some combination of both (Oyer & Schaefer, 2010).

(a) Efficiency Wages and Productivity

238. Narrowly defined incentives necessarily involve varying rewards for particular tasks. This can negatively impact performance on less measured activities and, in doing so, has the potential to invite unintended consequences in multi-task environments (Holmstrom & Milgrom, 1991). Thus, one must be particularly careful when designing contracts that heavily rely on performance pay and/or piece rates. In situations where

exhaustive contracts are impossible, or impractical, efficiency wages offer a promising alternative.

239. Compensating labour at or above the market rate (at an 'efficiency wage') reinforces the opportunity cost to employees of losing their positions and reinforces the attractiveness to outsiders of their role. This should help increase effort, reduce turnover, reduce the duration of vacancies, and increase the average quality of candidates in the firm's applicant pool. In truck driving, the immediate opportunity cost is the choice between the truck driver's current job and the next best alternative in the road transport sector. When weighed across the labour market, it is the alternative to employment in another sector, such as construction.

240. This concept introduces one mechanism through which lower pay can harm productivity and, ironically, end up raising labour cost (Yellen, 1984).

241. There may be other effects from higher wages that rely not on the behaviour of labour but of capital. If the price of labour goes up, then firms may have an incentive to reorganise firm production and invest in labour-saving technology (Freeman & Medoff, 1984; Fukumoto & Muto, 2012). The introduction of labour-saving technology and equipment will mean that less labour is required to produce the same output. Opportunities for labour-saving technology are limited in trucking by the opportunity, or lack of opportunity, to put more weight or volume on any specific truck.

242. Efficiency wages are often thought of at the firm level, so it is natural to question if there are still positive effects on productivity if all firms raise their wages. Empirical evidence examining a minimum wage, which is a price floor on the wage rate, suggests there still may be productivity benefits. Rizov, Croucher, and Lange (2016) found that Britain's National Minimum Wage positively affected aggregate productivity, as measured by total factor productivity, in the low paying sector. Similarly, H. S. Kim and Jang (2019) show that increasing the US federal minimum wage immediately improved restaurant productivity in both low and high wage restaurants, as measured by revenue per employee. They found this effect lasted for up to two years and found no evidence of loss of employment in food service businesses (e.g., food service restaurants). In a similar fashion to higher minimum wages, efficiency wages promote increased productivity because they attract better workers, they motivate existing workers, and they encourage firms to implement productivity enhancing strategies.

243. According to Yellen (1984), the microeconomic foundations for the efficiency wages revolve around shirking, labour market dynamics, adverse selection, and social norms. We turn to these issues, and look at shirking first.

Shirking

244. In most jobs, workers have some discretion in their effort. This creates the opportunity for 'shirking' (using less effort than optimal in trade for remuneration). While firms can combat this by attaching compensation directly to employee output, it is often difficult to effectively specify all aspects of a worker's performance in

complicated multi-task operations. Under these conditions, piece rates can be inefficient (see Kleiner & Freeman, 2005). However, as suggested above, efficiency wages may still be an effective way to combat shirking (Shapiro & Stiglitz, 1984).

245. The ability to inhibit shirking through higher compensation has been explored through several means. For example, Cappelli and Chauvin (1991) utilize a unique set of plant-level data taken from the internal records of a large manufacturing company for 1982. They found that wage premia were negatively associated with shirking. They used disciplinary dismissals as a measure for shirking. Furthermore, they noted shirking and disciplinary actions are lower when conditions in the labour market raise the cost of shirking. For example, it is more difficult to find another job in a slack labour market, raising the cost of shirking.

246. More recently, Georgiadis (2013) uses a shirking model to test the impact of the United Kingdom's (UK's) national minimum wage in the residential care homes industry. The minimum wage appears to have increased the average wage in the industry, led to a reduction in supervision costs, which they infer resulted from a reduction in shirking, and also in a modest increase in unemployment (relative to the size of the wage increase).

247. Finally, Giménez-Nadal, Molina, and Velilla (2021) test the existence of efficiency wages in the French and Spanish labour markets using an 'urban efficiency wage' framework based on commuting distance (see Zenou, 2006; Zenou & Smith, 1995). In the model, shirking and leisure time are considered to be substitutes (see S. L. Ross & Zenou, 2008).[5] Their results suggest that there is a negative correlation between commuting and leisure time as well as a positive correlation between commuting and shirking.

Labour Market Dynamics

248. Labour turnover can be expensive due to greater administrative costs, search costs, reduced productivity during the 'replacement process' of workers, and training costs associated with the hiring process. All else constant, workers will be more reluctant to quit at higher relative wages, thus reducing firm costs (Levine, 1993).

249. This is supported by Holzer (1990), who analysed data from a 1982 survey of US firms. He found that firms' wage levels were positively associated with the previous experience of new hires, managers' perceptions of employee productivity, and the ease of hiring qualified workers. Additionally, firms' wage levels were negatively correlated with job vacancy rates (consistent with monopsony theory, discussed later) and training time. In the analysis, high-wage firms could offset more than half of their higher wage costs through improved productivity and lower turnover. For these reasons, paying

[5]This theory posits that employees who devote comparatively more time to commuting have less time to devote to leisure activities and, thus, have incentives to shirk at work, which decreases their effort, and, thus, commuting and wages should be positively associated to avoid shirking.

higher wages allows companies to acquire better candidates who will have longer tenure with the firm.

Asymmetric Information and Adverse Selection

250. Adverse selection spirals can occur in the presence of asymmetric information with heterogeneous goods and/or services. It is based on the premise that consumers do not have complete information about the quality of individual products in the market, just the average level of quality. Coupled with heterogeneity, consumers face some probability of getting a lemon (a poor quality product), so they must lower their willingness to pay from the amount that they would pay for getting a peach (a high quality product) with certainty. If quality (labour ability, in the case of truck drivers) and suppliers' (in this case, workers') reservation prices (their wages) are positively correlated, lower wage offers in this way should drive the higher quality services (the peaches) out of the market first. This raises the probability of getting a lemon, lowers the expected value of the buyers' purchase and, subsequently, causes the buyers to reduce their offers for fear of getting a lemon. This process will repeat itself until there are only lemons remaining in the market (G. Akerlof, 1970). George Akerlof won the Nobel Prize in 2001 for 'The Market for Lemons'.

251. In a similar fashion, firms do not have complete information on the quality of all individual workers—only information on average worker quality. Offering lower wages, to compensate for asymmetry, may cause adverse selection—when firms select lower quality workers (lemons) because high quality workers (peaches) will be the first to leave the industry. Workers' willingness to accept lower wages may signal that they are lemons. Firms, therefore, may want to pay higher wages to get the best labour; alternatively, they will need to pay careful attention during the screening process when examining a worker's background and previous employment history. This is why the market for lemons explains how an unregulated labour market, without wage floors, can lead to the 'race to the bottom'.

Social Norms and Fairness

252. Workers take account of social factors when they judge whether they are being paid properly (G. A. Akerlof, 1982) because they believe they should be paid fairly. While the concept of fairness may seem vague, workers effectively 'look over the fence' at their neighbour to decide whether they are being paid commensurately with their skill and the difficulty of their job. Arthur Ross, for example, argued that this comparison with others constitute an 'orbit of comparison' within which workers place themselves (A. M. Ross, 1948). Consequently, workers' effort may be influenced by social norms such as fairness. For example, when workers believe they are being compensated 'generously', or even 'fairly', this may induce extra effort to justify the perceived 'extra compensation' they are receiving (Adams, 1963, 1965; Levine, 1993).

253. The relationship between social norms and wages has been analysed in many ways. For example, Breza, Kaur, and Shamdasani (2018) conducted a labour market experiment with Indian manufacturing workers. They randomized whether co-workers

within production units receive the same flat wage or differential wages according to their productivity ranks. They found that when co-worker productivity is difficult to observe, pay inequality reduces output by almost a half a standard deviation and co-worker cohesion declines. However, when workers can perceive clearly that their higher-paid co-workers are more productive, they found that the pay disparity had no effect on output or cohesion. This implies that workers have a sense of fairness when relating their compensation towards effort and productivity.

254. Peer comparisons indeed have a long lineage in the industrial relations literature (Ross, 1948). Quite recently, Dube, Giuliano, and Leonard (2019) used regression discontinuity to analyse how employee-firm separations respond to arbitrary differences in employee own and peer-wages at a large US retailer. They found large causal effects of own-wages on separations, particularly on quits. *A priori*, it is unclear whether this reflects comparisons to market rates or to peer-wages. Indeed, estimates using peer-wage discontinuities showed large peer-wage effects and, consequently, they argued that own-wage separation responses may mostly reflect peer comparisons.

(b) Hiring Practices, Retention, Tenure, and Productivity

255. As employees accumulate organizational tenure they are shaped by, and acclimatize to, their organization's culture (Chatman, 1991; Louis, 1980), and acquire organization-specific knowledge and skills (Tesluk & Jacobs, 1998). By extension, their work performance tends to improve and productivity gains are made (Quiñones , Ford, & Teachout, 1995). There is value to employment stability.

256. Ng and Feldman (2010) provide a meta-analysis on the relationship between organizational tenure and job behaviours — specifically core-task behaviours, citizenship behaviours, and counterproductive behaviours. They survey 350 different studies with a cumulative sample size of approximately 250,000 workers. They find that longer tenure is generally associated with better in-role and citizenship behaviours and that the tenure-performance relationship is curvilinear. Naturally, hiring and staffing practices have a direct impact on the retention of employees and in turn employee tenure. This should positively influence performance as well.

257. In an opposing manner, firms that engage in 'numerically flexible' labour market practices may trade short-term efficiency gains for long run progress in terms of firm performance, innovation, and employment. Primarily, this trade-off occurs when firms engage in low road business practices, which are defined by the use of short-term and/or temporary employment contracts, a lack of employer commitment to job security, and inadequate levels of onboarding and training. For example, Michie and Sheehan-Quinn (2001) use a survey of British firms to explore the relationship between firms' use of various flexible work practices and corporate performance. They find that low road practices are negatively correlated with corporate performance. Furthermore, Michie and Sheehan (2003) find low road practices are negatively correlated with firm innovation and Michie and Sheehan (2005) find that the relationship between human resources (HR) and performance depends on business strategy. For firms pursuing a

'high road strategy', HR investment is positively correlated with productivity and profitability. Alternatively, low road strategies are associated with a greater degree of turnover and reverses the correlation between HR investment and performance. By engaging in low road practices, firms are saving on labour costs today, but they may pay for it down the road.

258. Other researchers have arrived at similar conclusions on the use of low road practices. Bryson (2013) uses nationally representative workplace data to study the effect of 'temp' workers, firm performance, and job satisfaction in the British private sector. He found that the utilization of precarious working arrangements is associated with better firm financial performance (after all, it is cheaper), but not labour productivity or gross value added per employee.[6] Furthermore, they found that the presence of temp workers is associated with lower employee job satisfaction, higher job anxiety, and lower satisfaction with non-pecuniary job conditions. More broadly, he found employees in workplaces that use temp workers receive higher wages than 'observationally equivalent' employees in non-temp worker workplaces after controlling for other factors. However, the presence of temp workers in the occupation is associated with lower wages for employees in that occupation. This suggests that using temp workers, which can be a low road practice, may exert downward pressure on wages for all employees in the occupation, not just wages among those firms.

259. Taking the previous results beyond occupational borders, Wang and Heyes (2020) examine the relationship between 'internal flexibility' (the ease with which firms can adjust the number of workers they employ —referred to by some others as 'numerical flexibility') and productivity in over 14,000 firms spanning 27 European countries. The use of short-term (fixed-term) contracts or temporary employment is one of the primary methods firms use to become internally flexible. Effectively, these firms can use low road practices. The researchers measure labour internal flexibility and productivity by surveying firm managers. First, they asked managers about their labour productivity relative to other establishments. Next, they asked managers to indicate how labour productivity has changed in the last 3 years. Finally, they asked managers who use fixed-term contracts how often a follow-on contract had been given to employees whose fixed-term contract had expired.

260. Their primary finding was that managers at establishments that do not use fixed-term contracts tend to rate relative productivity higher than establishments that utilize fixed-term contracts. The authors acknowledge the limitation of utilising self-reported managerial responses to approximate productivity levels between firms However, the authors' claim is corroborated by a negative correlation between the employment of highly skilled, presumably more productive, workers and the use of fixed-term contracts. Their subsequent finding is that managers at establishments who utilize fixed-term contracts but retain most of their workers once their fixed-term contract expires tend to rate their relative productivity and productivity growth higher than firms

[6] Labour productivity was defined here as the log of gross output per worker and is derived by dividing total sales by total employment at the workplace. Gross value added per employee is derived by subtracting the total value of purchases of goods, materials, and services from total sales, and then dividing by total employment. Bryson (2013) uses both measures in log form.

that do not renew fixed-term contracts. As previously discussed, productivity increases with employee tenure, so retaining these employees should increase productivity.

(c) Productivity and Long Hours

261. Road transport is infamous for long hours. Working for too long is unsafe and unhealthy, thus productivity gains may be achieved by reducing working hours and reducing safety related costs. This may also come with a reduction in output because workers are spending less time on the job. However, empirical evidence suggests that 'unusually long' working hours may not be as productive as 'regular' hours. Therefore, when holding all else constant, reducing work hours may not necessarily have a negative impact on firm output *depending on the origin of the reduced hours*. Specifically, reducing unpaid non-driving working hours for truck drivers could well contribute to increasing the efficient use of trucks and higher return on capital investment.

262. The relationship between excessive working hours and the impact on output is well understood. For example, Pencavel (2015) studied the relationship between work hours and output for British munition workers during World War 1.[7] He found that the relationship between work hours and output was nonlinear. Output rose at a decreasing rate as working hours increased. This relationship held both in terms of hours worked per individual shifts and in total hours worked throughout the week. Thus, the last hours in a long workweek, or even a long workday, are not as productive as the first few.

263. Collewet and Sauermann (2017) find similar results when they study the link between working hours and productivity for call centre agents. They exploit the variation in hours worked by the same employees and find that the average agent becomes less productive as the number of hours worked increases. Additionally, D. Kim et al. (2023) find in a sample of 514 Korean companies that the technical efficiency of labour-intensive industries improved after a reduction in working time. This suggests that road transport, which would be classified as labour-intensive, could benefit from a reduction of working hours.

5.3. Precarious Work Conditions, Subcontracting, Health, and Safety

264. The rise of the neoliberal ideology in economics and policy (deregulation of product, service, and labour markets, including a reluctance to challenge extensive mergers and market power), rapid expansion of information technology, and globalization have led to the 'fissuring' of employment relationships in a growing number of low-wage industries. Industries become fissured when lead firms—those that determine the product market conditions in which wages and work conditions are

[7] The outbreak of World War I caused the government to suspend regulations on work hours in plants producing war related material. The work week was extended and the employment of men for 70-90 hours a week was common, 90 hours was not infrequent, and there were even cases of hours in excess of 100.

set—have separated themselves from the employment relationship (Weil, 2014). Subcontracting allows employers to obtain labour to cover peak demand without carrying the additional labour during slack times or overhead from workers' compensation, superannuation, holiday leave, and sick leave. In essence, subcontracting, as a replacement for the employment relationship, treats workers as individual market participants and human resources divorced from their personal needs for food, shelter, and family life.

265. Firms that hire workers as independent contractors often operate in hyper competitive markets that can be a fertile environment for regulatory non-compliance, health problems, and safety hazards (Fudge & Zavitz, 2006; Hardy & Howe, 2015; Mayhew & Quinlan, 1999; Mayhew, Quinlan, & Ferris, 1997; Weil, 2011). Mayhew et al. (1997) find that due to increased pressure and thinner operating margins, subcontractors, the self-employed, and small business are less likely to see occupational health and safety as an issue warranting attention. As a result, users of contractors are less likely to have occupational health and safety programs, regularly assess occupational health and safety risks, or undertake occupational health and safety training. The effect of subcontractors and the self-employed can amplify potential safety risks due to their horizontal and/or vertically integrated relationships. This complexity flows on to occupational health and safety systems, undermining their effectiveness, and therefore making it more it difficult to implement occupational health and safety controls. Subcontracting itself leads to complex worksites that can stretch regulator resources or create complex webs of legal responsibility without explicitly defined duties. Subcontractors and self-employed workers may not be fully covered by employment regulations, including awards, and they are less likely to be able to collectively address their occupational safety and health risks.

(a) Safety, Health, and Pay

266. The rise of precarious working arrangements has also come with a commensurate reduction in compensation, which can have an independent effect on health and safety outcomes. To the extent that safety performance, as *measured performance,* is important to managers, and to the extent that safety factors are endogenous to labour characteristics, this implies that higher wages should lead to better safety performance.

267. Literature suggests a positive relationship between higher pay (income), job quality, and several facets of health (see Sayre & Conroy, 2023). For example, Sherman and Addy (2018) use 2014 data for approximately 43,000 self-insured employers from four US companies participating in the 'RightOpt' private exchange. They divided participants into five different wage groups and used logistic regression to analyse whether employees participated in health risk assessments and/or biometric screening, controlling for the presence of comorbidities, location, gender, age, and other demographic characteristics. They found participation rates for health risk assessments and biometric screening were highest at higher wage categories and declined with the level of pay.

268. In another example, using data from the Survey of Health, Ageing, and Retirement in Europe, Henske (2018) tests the relationships linking job characteristics, current health, past smoking behaviour, home ownership, the socioeconomic conditions of respondents' childhoods, and more, with a battery of six morbidity indicators: 'acute health conditions'(such as heart attack, stroke, and cancer); 'cardiovascular risk'; 'musculo-skeletal disorder'; 'mental health'; 'functional disability'; and 'self-assessed health'. He finds that monthly pay is negatively associated with all morbidity indicators. Furthermore, job insecurity is mostly significant (five out of six indicators) and positively associated with all morbidity indicators. Additionally, job quality is significant for half of the indicators and negatively associated with all morbidities. Unfortunately, the author does not distinguish between correlation and causation, though it would be hard to argue that those health outcomes cause, say, poor job quality.

269. Continuing with the relationship between pay and health outcomes, Sayre and Conroy (2023) frame the connection using allostatic load theory. This theory suggests that the human body seeks to maintain equilibrium throughout environmental change. When the body encounter a threat or challenge, the body's equilibrium is disrupted. As a result, the body engages in a twofold response to re-establish equilibrium. First, in order to provide energy to address the threat, activation is increased through the release of stress hormones, such as adrenaline and cortisol). Second, when the threat passes, the body reduces activation to recover and return to its baseline operating condition homeostasis). If this stimulation is chronic, as it would be in the case of long hours, work pressure, and poor working conditions, this pattern of activation and, particularly, recovery is disrupted. This results in 'allostatic load', which has downstream consequences for health (Guidi, Lucente, Sonino, & Fava, 2021). For example, money is essential to fulfilling our basic needs for survival (food, shelter, clothing, medical care). When pay is too low, this creates a high level of stress (allostatic load). Furthermore, low pay can result in limited access to medical care and missed opportunities for treating and/or detecting treatable conditions. There is empirical evidence that experiencing material scarcity will direct cognitive, attentional, and self-control resources towards remedying scarcity and away from other endeavours. For example, when pay is insufficient to meet basic needs, individuals will be forced to spend more time and effort addressing financial scarcity and less energy addressing their physical and mental wellbeing (De Bruijn & Antonides, 2022; Shah, Zhao, Mullainathan, & Shafir, 2018).

270. The linkage between work characteristics, defined as 'employee' specific characteristics and 'job' specific characteristics, has been explored in research such as that reported by Allard E. Dembe, Erickson, and Delbos (2004). They use responses to the 1998 National Longitudinal Survey of Youth to identify and analyse work factors associated with the occurrence of occupational injuries and illnesses. They perform two main empirical analysis. The first analyses the relationship between employee characteristics and reporting a work-related condition while controlling for gender, region, occupation, and industry. They find that socio economic status (proxied by low family income and lack of home ownership), low education (educational attainment below high school completion), working more than 60 hours a week, respondents

disliking their job, and working in a high-risk occupation were associated with higher odds of reporting a work-related condition controlling for race, rural residence, union coverage, the presence of health insurance, and shift work. These employee characteristics are similar to the characteristics of the typical commercial truck driver. The other analysis examined the relationship between job characteristics and reporting a work-related condition, again controlling for gender, region, occupation, and industry. They found that performing physical tasks such as lifting or carrying weights larger than 4.5kg, exerting high physical effort, and kneeling or crouching had a high association with reporting a work-related condition. In other words, jobs with a higher level of physical labour and exertion lead to poor outcomes.

271. Increasing pay to alleviate health-related conditions, caused or amplified by work, is just one part of the equation. We also need to consider the structure of pay. For example, performance-based pay systems, which are most common in RT, are designed to elicit worker effort and exertion, which is key in the principal-agent problem. However, these systems also can result in overexertion, exhaustion, stress, and, consequently, chronic exposure to allostatic load (Sayre & Conroy, 2023)

(b) Performance Pay and Health:

272. Performance pay is cited often as a best practice HR management literature, as it often results in increased productivity by directly attaching compensation to output (Park & Sturman, 2022). Piece rate pay, which is an extreme form of performance pay, has a strong track record for improving measured output. For example, Paarsch and Shearer (1997) find that piece rate compensation improved the productivity of tree planters in British Columbia. Lazear (2000) found that switching to piece rate pay dramatically increased the average number of windshields installed by workers at Safelite Glass Corporation. Piece rates, whether they be trip (load) or distance based, tend to be the modal type of compensation in trucking, particularly for owner operators and subcontractors.

273. However, economists have long recognized that piece rate pay can have deleterious health consequences. In fact, in the *Wealth of Nations*, Adam A. Smith (1776) famously writes that 'Workmen… when they are liberally paid by the piece, are very apt to overwork themselves and to ruin their health and constitution in a few years'. The empirical evidence certainly seems to support Smith. Kleiner and Freeman (2005) found that moving away from piece rates reduced both workers' compensation claims and sick time at a large United States (US) shoe manufacturer. Patterson (2007) found that piece rate systems encouraged behaviour that increases the probability for accidents, injuries, and fatalities, among logging contractors in British Columbia. Toupin, LeBel, Dubeau, Imbeau, and Bouthillier (2007) found that Canadian brush cutters who were paid by the piece tended to work 'in a way that may compromise their health and safety'.

(c) Externality Theory and Monopsony Power

274. Two mechanisms by which inputs or products can be under-priced are through non-pricing of externalities and through the exercise of monopsony power. Microeconomic theory suggests that regulation has the potential to increase net social benefit by correcting negative externalities and combating monopsony buying power.

275. A negative externality is a cost borne by non-participants in a market interaction that is not considered in the market price. In the case of RT services, the externalisation of safety costs is a negative externality. Monopsony buyer power occurs when there is non-trivial buyer-side power in the market allowing buyers to dictate prices. In the case of RT services, this is related to purchasing RT workers' labour.

276. In the presence of negative externalities, RT is prone to overproduction at an inefficiently low price point. In perfectly competitive markets, drivers would be compensated for work disamenities (Rosen, 1974; Thaler & Rosen, 1976) like work stress, long hours of work, and unsafe and unhealthy conditions. However, by market construction, only 'private costs' are considered, and external costs are not.

277. An important concept here is that of 'Pigouvian' pricing and its implications for minimum prices. The concept of Pigouvian pricing — also known as 'all in' pricing — originated with the early 20th Century economist A.C. Pigou (1920) and was formalized for modern economics by William Baumol (Baumol, 1972). Fully implemented Pigouvian pricing requires that all the costs associated with an economic activity be incorporated within price and discourages 'externalities' — costs that are borne by the public because they are external to price. In the presence of *both* a supply-side negative externality *and* monopsony power on the demand side, textbook theory would tend to suggest that Pigouvian rate floors, and taxes implemented to correct inefficient market outcomes, should unambiguously increase social net-benefit and enable carriers to compensate drivers for workplace disamenities because production occurs at an inefficiently low price point (the main reason why the industry experiences 'driver shortages'). Pigouvian rate floors may also increase market volume (e.g., number of drivers attracted, amount of freight moved, etc.), due to price being below the equilibrium level, but this would depend on the size of the external cost relative to buyers' price power.

278. When employers and hirers exert monopsony power, markets also are prone to under production at an inefficiently low price point. While in its purest form, the term monopsony refers to a single buyer, in practice monopsony refers to any situation where buyers exercise power over the prices they pay (in contrast to the perfectly competitive model of a labour market, in which the price of labour is set by 'the market' and everyone is a price taker). The fewer large firms dominate a market, the more monopsonistic it is. In monopsonistic markets, firms may exercise discretion to pay a lower price for labour than would be the case under a perfectly competitive model. Less labour would be offered than firms are willing to purchase, but firms are happy to maximise their profits by paying these lower prices and tolerate labour shortages. The more power that firms have, the greater their ability to exercise the discretion to pay low wages. Monopsony power also would therefore tend to result in a situation in which carriers are not fully compensated for disamenities either (Manning, 2013).

5.4. Conclusions

279. This chapter canvassed, at a general level, the economic theory of pay, safety and health, mainly using material drawn from outside the road transport sector. Theoretical and empirical economic investigations about compensation and productivity discussed in this chapter show that:

- narrowly defined incentives can have unintended consequences;
- higher wages are associated with greater productivity, while lower pay is associated with lower productivity;
- 'shirking' is reduced by higher wages and less wasting of workers time by such factors as commuting time;
- paying higher wages allows companies to acquire better candidates who will have longer tenure with the firm;
- workers have a sense of fairness about their and they are likely to leave if they perceive their own wages are low relative to comparable peers;
- when workers believe they are being compensated 'generously', or even 'fairly', this may induce extra effort to justify the perceived 'extra compensation' they are receiving, thereby affecting effort and productivity;
- an unregulated labour market, without wage floors, can lead to the 'race to the bottom', with high quality labour leaving a labour market for better offers elsewhere;
- low road employment practices (such as high use of temporary staff) are negatively correlated with corporate performance, innovation and job satisfaction;
- hourly labour productivity declines as working hours increase into higher ranges;
- morbidity increases as wages, job security and job quality fall;
- jobs with a higher level of physical labour and exertion lead to poor health outcomes;
- performance-based pay schemes can lead to overexertion, exhaustion and stress, and encourage behaviour that increases the probabilities of accidents, injuries, and fatalities;
- especially in cases where there are negative externalities and monopsony power, under-pricing of labour will lead to inefficiencies, below-par social welfare and workplace disamenities which lead to 'labour shortages'.

280. The economic theory outlined in this chapter will be drawn on in the next chapter to provide support for efficiency wages in the form of 'safe rates' (including payment of truck drivers for their non-driving time) which, it will be argued, are important for safety and economic efficiency.

6. The Economics of Pay, Safety, and Health in Road Freight Transport: Return on Investment, Private Sector Productivity, and Efficiency

6.1. Introduction

281. This chapter continues the analysis of pay, safety and health but focuses more specifically on the road freight transport industry. It canvasses the potential effects of regulation on productivity and other costs.

282. Economists have long recognized that compensation, working conditions, and hiring practices are motivating factors for labour. After all, people respond to incentives. However, the money has to come from somewhere. Thus, by this perspective, market interventions should be anchored to some sort of net-efficiency gain. These gains can be internal to the firm, the market, and/or, to the extent that costs and benefits are externalized, borne by society as a whole in the form of reduced economic welfare. In this chapter, we will address the internal benefits of safe and sustainable compensation and human resource management practices.

283. As previously discussed, the utilization of efficiency wages can result in increases in worker productivity by encouraging workers to exhibit more effort. If the increase in productivity, measured as the value of output per labour hour, surpasses the increased cost of wages then firms will have a positive return on investment (ROI). Faulkiner and Belzer (2019) show that large US trucking company that increased driver compensation earned more than US$10,000 greater per year net present value on each higher paid experienced driver, in comparison with the low-wage drivers it previously employed. The higher paid drivers had much greater productivity throughout the one-year period of observation. Outside of the financial gain from increased productivity there are secondary gains through efficient hiring and retention. Higher pay results in better workers, which results in lower turnover, less money spent on recruiting and training, and better equipment utilization due to a reduction of parked trucks due to lack of drivers (‘unseated trucks’) at the price trucking companies and shippers are willing to pay. Furthermore, ROI gains can result from lower maintenance costs because drivers are more familiar with the trucks and their routes, and more competent and better prepared to deal with road hazards and changing routing and scheduling requirements. Moreover, higher compensation resulted in fewer crashes, reducing the number of deaths, injuries, and property-related damage.

284. Given the discussion of economic theory in the previous chapter, it may not be surprising that reductions in safety costs are one of the main sources of return on investment (ROI) from sustainable remuneration and working conditions. Of course, the extent to which the firm finds safe rates to be net-beneficial depends on the amount of safety costs society subsidizes on their behalf. However, we will put this discussion aside for now and return to the topic of external/social benefits in chapter 7. To provide context, we begin by connecting some of the economic theory previously discussed

around economic incentives, working conditions, hiring practices, and their relationship to productivity to the road transport industry. From there, we will make the case that increased efficiency and productivity gains will at least partially compensate for any added costs of safe remuneration and high-road human resource management practices.

6.2. Trucking Pay, Work Hours, Safety, and Productivity

285. Belzer, Rodriguez, and Sedo (2002) examines the link between truck driver pay, the number of hours they work, safety outcomes, and driver performance. Their report consists of three different studies, using three different data sets. These suggest that upstream economic incentives may shape downstream safety and performance outcomes in road transport.

(a) Study 1 - Truck Driver Labour Supply Curve

286. The first study utilizes data from the University of Michigan Trucking Industry Program's driver survey to estimate a labour supply curve for US long-distance truck drivers. They observe a full 'backward-bending' labour supply curve. The term 'backward-bending' refers to the visual appearance of a labour supply curve, which slopes upwards to the right for a while but then swings around and slopes upwards to the left. That means that, in lower-income ranges, higher wages lead to the worker to accept more hours of labour (as per the conventional labour supply and demand model) but that, at some point, the relationship between pay and hours offered changes, and in higher-income ranges, higher wages lead truck drivers to work to *fewer* hours each week.

287. In this specific study, drivers demonstrate a tendency to work more hours until they hit their 'target earnings' (Camerer, Babcock, Loewenstein, & Thaler, 1997), within the range of valid observations. However, this 'turning point' in the labour supply curve is not reached until they work an undesirably high number of hours. The relationship is further analysed in Belzer and Sedo (2018). According to the derived labour supply curve, many drivers are willing to work more than 60 hours weekly to reach their target earnings. This finding is consistent with more recent evidence on driver work hours in the US (see Kudo & Belzer, 2019) and seems to be broadly similar to Australian driver work hours as well (see Williamson & Friswell, 2013).

288. Relative to other occupations, truck drivers work very long hours. This has a deleterious effect on their long run health and safety performance, so reducing these hours may be a source of increased productivity as well as firm ROI. A. E. Dembe, Erickson, Delbos, and Banks (2005) find that working in jobs with overtime schedules (defined by the US Fair Labour Standards Act to be at least 40 hours per week) was associated with a 61% higher injury hazard compared to jobs without overtime; working at least 12 hours per day was associated with a 37% increased hazard rate; and working at least 60 hours per week was associated with a 23% increased hazard rate when controlling for industry. Moreover, since drivers already work long hours, fewer work hours may have a lower consequence on overall productivity because these reduced

work hours may come from already excessive and less productive hours (Pencavel, 2015; D. Kim et al. (2023).

289. Pay structure also plays an important role on driver work hours. Almost all US long-distance truck drivers are paid on a piece rate basis, meaning they are not paid for much, if any, of their non-driving labour (Kudo & Belzer, 2019; Ryley & Belzer, 2023; Williamson & Friswell, 2013), and therefore have an incentive to log non-driving time as off duty. This, in turn, increases the number of hours worked, during both the day and the week, and contributes to fatigued driving. However, it also transfers the cost of delay away from the freight owner onto individual drivers because they are not being paid unless their vehicle is transporting freight. This makes it more difficult for drivers to reach their target earnings and further contributes to fatigued and unsafe driving. Consequently, the piece rate pay structure results in little to no incentive for carriers to prevent freight owners from free-riding on drivers' time, because carriers only need to pay drivers for their production, which is mostly based on loaded miles driven. This lack of incentive to conserve drivers' time invites delays and increases the duration of driver and truck dwell time, which is non-driving time spent waiting to load or unload. Drivers are not paid for waiting to be dispatched, waiting in a queue, or a variety of other activities unless their vehicles have departed the origin and are on their way to deliver freight. If non-driving time is free, then 'buyers' of that free time have an incentive to use as much of it as they please. This is both expensive and dangerous (see Office of the Inspector General, 2018).

290. Modifying drivers' pay structure by requiring them to be properly compensated for both driving and non-driving time has the potential to lead to a net-increase in productivity through two mechanisms. First, it will reduce fatigued driving and improve health outcomes by reducing allocative load. For example, if drivers are paid for their non-driving time, then they would be less inclined to work excess hours to reach their target earnings. Drivers will no longer have to offset their dwell time and therefore be less fatigued when driving. Additionally, if drivers are compensated for their time, they will have more opportunities to deal with chronic illness and health conditions. Multiple scholars have found that employees in jobs with performance pay report being less healthy (Bender & Theodossiou, 2014; Davis & Hoyt, 2020; Kudo & Belzer, 2020). DeVaro and Heywood (2017) found that performance paying jobs were associated with higher levels of absence due to illness, and Artz and Heywood (2015) found that performance pay was associated with greater risk of injury. Notably, these effects appear to be stronger for low-income (Davis & Hoyt, 2020) and 'blue-collar' labour such as truck drivers (Artz & Heywood, 2015). In short, healthier workers are more productive workers.

291. Reducing driver fatigue also will organically reducing compliance costs, improve safety performance, and therefore increase productivity. Friswell and Williamson (2019) find that driver queuing time, waiting to load and/or unload, and a limited number of rest opportunities is cited as a primary concern by surveyed drivers because of fatigue implications. In a subsequent interview with representatives from 13 of the companies with surveyed drivers, the authors imply that firms may be negligent in their safety responsibilities, because they do not place a high importance on managing drivers' hours of work or rest opportunities. Driver fatigue, and in turn safety incidents, can be

reduced by requiring drivers to be paid for non-driving time. This would cause carriers to internalize more of the cost of delay and incentivize them to charge freight owners for queuing time. This will allow carriers to accumulate revenue to offset delay costs and help pay drivers for the time. In essence, this increases the 'price' of delays and should reduce average dwell time because it would not be possible to free-ride on drivers time. If mandated by policy, carriers would not face a competitive disadvantage for being safe by not wasting those driver work hours because all carriers would be required to engage in the same practice. This would be akin to 'Chain of Responsibility' legislation under the Heavy Vehicle National Law, where it is the legal responsibility of all members of the contractual chain to support roadway safety. When all parties play by the same set of rules that promote safety, then the potential productivity gains from reducing road transport incidences can be large.

(b) Study 2 - Truck Crashes as a Function of Pay

292. In this study, the authors use negative binomial regression to predict the number of crashes firms experience as a function of driver pay. They find that the sum of compensation effects is inversely related to crash incidence at a nearly 1:1 level. The model predicts that, at the mean, for every 10% increase in driver compensation, there are approximately 9% fewer crashes, holding all other factors constant. Crashes are expensive for all parties involved, in which case, the cost of better pay for drivers should be directly offset by improved safety performance. As seen by this study, increasing compensation does result in safer drivers. Explicitly in chapter 7, it will be shown that this increase in compensation results in a net-positive for society, and, most likely, for firms. More recently, Ryley and Belzer (2023) used a similar set of data and, and once again, found there to be a significant relationship between compensation and crash incidence. In the recent study, which lacked data on truck driver non-driving work hours, the relationship between pay rate and safety was significant but ambiguous, due to data shortcomings.

(c) Study 3 - High Road and Safety Performance:

293. In this study, the authors take advantage of a large pay raise and a management paradigm shift towards the high road, which included hiring more experienced drivers, at a major truck load motor carrier. They construct a quasi-experiment testing the direct effect of these developments on the carrier's safety performance. They find that higher driver pay and pay increases are associated with improved safety performance, which, presumably, should offset at least some of the higher labour cost such as in the first study. These findings support fair/efficiency wage theory because drivers will exert more effort as the opportunity cost of shirking increases. If it is more difficult to obtain a job with comparable pay, then workers will perform at a higher level to keep their job. Furthermore, increasing compensation should increase the average quality of candidates. Pay incentives work as a screening mechanism to reduce the effects of adverse selection by allowing carriers to screen for better new hires and simultaneously screen out worse workers. As previously discussed, higher pay naturally attracts better workers, therefore if workers are willing to sell their labour at a lower price that is a signal that they are low quality workers. This phenomenon was well established by

Akerlof's 'Market for Lemons', in which inferior lemons drive out superior peaches. The 'market for lemons' (mentioned in paragraphs 250 to 252) is an important engine for the race to the bottom (Akerlof, 1970).

294. The second finding of the study is that driver tenure contributes to better safety performance. The latter finding is corroborated by human capital theory that stipulates organisational performance is a function of employee human capital and increases with employee tenure. An example in the motor carrier context is drivers with extended tenure at the firm, who have acquired more human capital during that tenure, may develop a better understanding of their customers, responsibilities and risks. This enables drivers to be more effective with their time management and allows them the ability to anticipate safety hazards (Daniel A Rodriguez, Targa, & Belzer, 2006). This leads to greater productivity, both through improved safety performance (Miller, Saldanha, Rungtusanatham, & Knemeyer, 2017) and technical efficiency.

295. By this logic, high turnover would prevent the accumulation of carrier-specific human capital, increase administrative costs due to more time spent recruiting drivers, lead to diminished safety performance, and, by extension, result in lower productivity. Faulkiner and Belzer (2019) support this argument by focusing particularly on the firm-level financial implications of the quasi-experiment. They found that the higher paid drivers were more productive, had lower casualty costs, were retained at a higher rate resulting in lower recruiting and training costs, which ultimately led a much higher net present value for the firm when compared to the lower paid and/or less-experienced drivers. In other words, better pay actually paid off handsomely for the carrier.

6.3. Owner Operator Use and Productivity

296. The employment of drivers by US for-hire trucking companies presents an intriguing puzzle to economists. Scholars using transaction-cost and agency theory have frequently cited road freight transport as an assignment for an independent contractor. Asset ownership provides an added incentive to owner operators to expend more effort, resources in vehicle maintenance, and careful driving. In theory, owner operators may provide a solution to the proliferation of externalized safety costs in road transport, due to vehicle ownership. This phenomenon will be discussed in chapter 8. However, at the same time, precarious working arrangements place greater economic pressure on owner operators.

297. In Australia, intense competition and the externalization of safety costs puts significant pressure on owner operators and subcontractors to underbid. This creates a 'race for the bottom' scenario culminating in a proliferation of precarious work arrangements (Hensher & Battellino, 1990; Hensher, Battellino, & Daniels, 1991; Quinlan, 2001, 2008; Quinlan & Wright, 2008; Thornthwaite & O'Neil, 2016). As previously noted, these types of precarious working arrangements may lead to short term cost reductions for firms, but an increased reliance on third party drivers could lead to lower productivity in the long run. Owner drivers are more likely to be paid piece rates, driver longer distances, work longer hours (Williamson, Bohle, Quinlan, &

Kennedy, 2009), experience more occupational violence (Mayhew & Quinlan, 2006), and accept lower rates (Deighton-Smith, 2014). Consequently, these can all lead to an increase in safety costs.

298. Owner operators are generally paid a higher piece rate compared to company drivers to account for the cost of capital and capital depreciation. This reduces capital expenses for firms, and in theory, should result in a net positive. However, capital ownership may incentivize unsafe behaviour when safety costs are externalized. Moreover, at least in the US, the violations, infractions, and crashes owner operators incur contribute to both their individual safety record and their employer's safety record. Fleet managers have less ability to monitor and exert control over owner operators compared to employee drivers, therefore this can lead to increased violations, which may lead to delays, an increase in compliance costs, and, through this means, may compromise brand equity for the employer. Therefore, to the extent that they bear the costs of poor safety, carriers making greater use of contractor owner drivers potentially could be exposing themselves to increased safety costs (Miller, Golicic, & Fugate, 2018).

6.4. Safety and Firm Financial Performance

299. An extensive body of research, beginning more or less contemporaneously with the early Australian and US research on the economics of safety, focused on the effects of firm financial performance on trucking company safety. This research stream, made possible in part by quality data collected by the Interstate Commerce Commission (a Congressional Commission created in 1887 to regulate railroads—later adding trucking to its portfolio—which was abolished at the end of 1994, following the last dramatic extension of trucking economic deregulation to US states), used firm-level operational and financial data to demonstrate that trucking companies on sound financial footing were significantly safer than firms operating on thin margins.

300. The goal of economic deregulation of transport had been to reduce the cost of freight and passenger transport significantly, and by 1988, the savings to economic welfare (by way of the national freight transportation budget) was estimated at slightly less than USD16 billion--equivalent to about USD 43 billion in 2024 dollars. Deregulation of trucking transferred approximately USD 20 billion (equivalent to about USD 54 billion today) to the railroads (Winston, Corsi, Grimm, & Evans, 1990), causing billions of dollars of losses to the general freight sector of trucking. About two-thirds of the foregoing savings, however, came from lower truck driver compensation and trucking firm profitability (Thomas M. Corsi & Stowers, 1991). Thin operating margins in trucking, however, had become a significant issue by 1990, as by that time it had become clear that the low wages for drivers and the precarious profitability of trucking companies were leading to rising safety hazards.

301. While many studies probed at this issue, an important study used the rich detailed data available at the time to examine the relationship between firm financial condition, the ability to pay higher compensation to truck drivers, and better safety performance. While the relationship was promising, the US Department of

Transportation had, as mentioned, rejected the findings and did nothing (General Accounting Office, 1991). More than a decade later, another study was performed on behalf of the FMCSA and came to similar conclusions across multiple subsectors of trucking. In addition, researchers found that higher 'return on assets' measures also predict superior trucking company safety outcomes (Thomas M. Corsi, Barnard, & Gibney, 2002). Similarly, Rodriguez et al. found used negative binomial regression models and found that small firms with high liquidity have better safety performance, and similarly, that small firms that devote a higher share of their revenues to labor expenses tend to have better safety outcomes. Firms that are not making money cannot devote significant resources to driver pay, and hence find themselves at greater risk (Daniel A. Rodriguez, Rocha, & Belzer, 2004). Trade union representation—itself naturally associated with higher driver pay—also is associated with better safety performance. "[U]nion membership has a statistically significant positive impact on both driver and vehicle safety performance" and specifically is associated with lower crash rates (Thomas M. Corsi, Grimm, Cantor, & Sienicki, 2012).

302. Recently, new research has reinforced this understanding. Using a longitudinal data set, Britto et al. used a multi-year data set to compare financial performance the first year with safety performance in the following year, finding that a stronger financial position in the first year was associated with better safety performance the following year, which provided evidence of causality (Britto, Corsi, & Grimm, 2010).

6.5. Conclusion

303. In this chapter, we addressed the internal benefits of sustainable compensation and human resource management. Economic theory, and the empirical results discussed in the bevy of cited literature, points to compensation, working conditions, and firm hiring practices as motivating factors for performance. The appropriate incentive will yield the desired outcome, which for firms is an increase in efficiency and productivity. The potential productivity gains by firms, and the industry at large, should offset the added cost of increased compensation by reducing costs related to the principal-agent problem of shirking, worker turnover, and safety. Adopting high road HR practices has the potential to facilitate gains in road transport.

304. Three related studies specifically on road freight transport and reviewed in this chapter suggest that upstream economic incentives may shape downstream safety and performance outcomes in road transport. One indicated that drivers tended to work more hours until they hit their 'target earnings', but this 'turning point' is not reached until they work an undesirably high number of hours. This tendency is intensified by piece rates (worked especially by contractors and owner-drivers) and non-payment for non-driving time. A second suggested that, on average, for every 10% greater driver compensation, there are approximately 9% fewer crashes, holding all other factors constant. A third found that higher driver pay and pay increases are associated with improved safety performance. It also found that greater driver tenure (commonly associated with higher pay) itself contributes to better safety performance.

305. US research has documented the effects of firm financial performance on safety. Firms that are not making a sufficient margin are at greater risk. As predicted by the broader efficiency wage literature, intense competition and externalization of safety costs leads owner operators and subcontractors to underbid, creating a 'race for the bottom' scenario that culminates in a proliferation of precarious work arrangements, which can lead to lower productivity in the long run. Owner drivers are more likely to be paid piece rates, drive longer distances, work longer hours, experience more occupational violence, and accept lower rates, all leading higher in safety costs. To the extent that they bear the costs of poor safety, freight owners making greater use of contractor owner drivers potentially could be exposing themselves to greater safety costs, but the biggest casualties are the drivers themselves and the other road users.

7. Economic Welfare (Social) Benefits of Regulation

7.1. Introduction

306. This chapter reviews the social benefits of regulation, that is those effects that may benefit society as a whole and not just the organisations making use of transport services.

307. Road transport (RT) workers are roughly 10 times more likely to die at work than the average Australian (Xia, Iles, Newnam, Lubman, & Collie, 2019) and the injury rate in the industry is approximately 50% higher than the national average (J. R. D. Edwards et al., 2014). The highway crash is the biggest acute threat truckdrivers face.

308. As discussed in Chapter 4, to the extent that crash costs are not incorporated in the price-driven market for trucking services, RT markets may suffer from what economists call a 'negative externality'. Externalities lead to inefficiency; in the presence of externalities (in this case, safety risks), the buyer of the good or service will buy the good or service at below the full social cost. Likewise, the seller will contract to provide goods or services at a price below the true cost. In effect, the transaction will be subsidized by the public, and society will get more of that good or service than is efficient. According to microeconomic theory, the presence of a negative externality implies that public intervention can be used to improve economic efficiency, and a policy effort should be made to reduce or eliminate that externality.

309. A considerable amount of evidence suggests that economic incentives play an important role in RT safety (Belzer et al., 2002; Hensher, Battellino, & Young, 1989; Hensher et al., 1991; Quinlan & Wright, 2008; Thornthwaite & O'Neil, 2016). For example, due to intense competition and the proliferation of just-in-time inventory management practices, truck drivers face significant time pressure. This can create stress, lead to physical fatigue, mental and emotional exhaustion, encourage negative attitudes about safety compliance, and ultimately lead to crashes (Belzer, 2018; Kemp, Kopp, & Kemp, 2013).

310. Many drivers also are paid on a predominantly piece rate basis, which, among other things, can provide an economic reward for unsafe driving behaviour (Quinlan, 2001; Quinlan & Wright, 2008). For example, according to the trucking literature, piece rate pay has been linked to logbook violations (Monaco & Williams, 2000), speeding behaviour (J. Edwards, Davey, & Armstrong, 2016; Hensher & Battellino, 1990; Hensher et al., 1991), longer work hours (Williamson & Friswell, 2013), increased fatigue (Williamson, Sadural, Feyer, & Friswell, 2001), and stimulant use (Thompson & Stevenson, 2014; Williamson, 2007).

311. There also is a clear relationship between pay, work conditions, and health (Sayre & Conroy, 2023). In the case of truckdrivers, pay structure influences their hours of work (Belzer & Sedo, 2018) and, generally speaking, long hours in a tractor are not

exactly conducive to a healthy lifestyle (Birdsey et al., 2015; Crizzle et al., 2017; Sieber et al., 2014). This increases the risk of morbidities, promises to lower drivers' quality of life, increases crash risk, and places a greater burden on the healthcare system.

312. Better paid workers tend to be healthier and safer. However, the ability for regulators to limit unsafe pay practices has been eroded by neoliberal policy 'rationalization' and the proliferation of fissured supply chains and subcontracting (Underhill & Quinlan, 2024; Weil, 2011). Indeed, motor carriers, particularly owner operators, are increasingly finding themselves at the bottom of complex contractual chains and bearing the full weight of the increasingly consolidated interests above them. This is unsafe (Mayhew & Quinlan, 2006; Rawling & Kaine, 2012; Thornthwaite & O'Neil, 2016).

313. At first glance, this may sound expensive. However, upon closer inspection, this is may not be the case. In this chapter, we will elaborate on the mechanisms by which safe rates should, in theory, increase net social benefit and, in this way, at least partially, pay for themselves.

7.2. The Economic Cost of Crashes

314. Truck crashes are expensive. For reference, Steinhauser and Lancsar (2022) estimated that, from 2016 through 2020, the average cost of a fatal crash in Australia was approximately $ 3.2 million; the average cost of a hospitalized injury crash was approximately $ 261,000; and the cost of a non-hospitalized injury crash was approximately $ 30,400. During that time, heavy rigid trucks were involved in nearly 32,000 crashes and articulated trucks were involved in approximately 23,000 crashes. According to Steinhauser and Lancsar (2022), roughly 0.25% of heavy rigid truck crashes were fatal; 3% of heavy rigid truck crashes resulted in hospital injury; and 8.5% of heavy rigid truck crashes resulted in non-hospital injury. Crashes by articulated trucks (trucks consisting of a tractor and one or more trailers) had greater damages: 0.4% of articulated truck crashes were fatal; 4.0% of articulated truck crashes resulted in hospital injury; and 9.7% of articulated truck crashes resulted in non-hospital injury. Using Steinhauser and Lancsar's (2022) average cost calculations, we can infer that fatal and injury-inducing heavy rigid truck crashes cost at least $ 590 million and articulated truck crashes cost at least $ 600 million. These are conservative estimates because they do not account for crashes that did not result in injury or fatality (property damage only crashes). Furthermore, Steinhauser and Lancsar's (2022) average cost estimates pertain to *all* road crashes instead of focusing exclusively on those that involve heavy trucks. This is important, because heavy truck crashes tend to have a higher likelihood of fatality, injury, and property damage than crashes involving other vehicle types – which makes them more expensive.[8]

315. For comparison, Zaloshnja and Miller (2007) estimate the costs of crashes involving medium/heavy trucks in the US. They found that crashes involving straight

[8] According to Seinhauser and Lancsar (2022), the most common type of crash involved the category 'cars and light commercial vehicles'. These had a fatality rate of 0.08%, which is 1/3 the fatality rate of heavy truck crashes and 1/5 the fatality rate of articulated truck crashes.

trucks had an average cost of approximately 2005USD 56,000; non-fatal injury crashes had an average cost of approximately 2005USD 195,000; and fatal crashes had an average cost of approximately 2005USD 3.6 million (this was equivalent to roughly $A 7 million in 2018, or more than double the estimate of Steinhauser and Lancsar (2022)). In terms of 2023USD, that equates to an average straight truck crash cost over USD 87000, an average non-fatal injury crash cost over USD 304000, and an average fatal crash cost over USD 5.6 million. While these estimates are high, they probably understate the cost of crashes. They exclude mental health care costs for crash victims, roadside furniture repair costs, cargo delays, the value of lost schoolwork, and the earnings lost by the family and friends who had to care for the injured. Furthermore, while these figures very well could be more accurate for heavy truck crash costs than Steinhauser and Lancsar's estimates, they are based on the value of a statistical life in the United States (US), where GDP per capita is about a quarter higher than in Australia. Finally, Zaloshnja and Miller (2007) also do not estimate the amount of truck crash cost that is externalized – just the total cost of crashes.

316. The US National Research Council (1996) proposed a method for estimation of the marginal social cost and marginal external cost of each major transport service mode. Where applicable, these estimates include measurements of congestion cost, accident costs, air pollution costs, energy security costs, and noise costs. Since estimates are sensitive to route characteristics, the proposed methodology is anchored at the trip level. For demonstration purposes, they apply their method to a number of different routes and modes. For sake of illustration, we will briefly summarize the marginal social cost of hauling a grain shipment from an elevator in Walnut Grove, Minnesota, to the Mississippi River port in Winona, Minnesota.

317. The first variation of this case study lays out the social cost of truck transportation via the most direct route. The net external cost was estimated to be approximately 1996USD 54.50 for that trip (~12% of a representative carrier's estimated trip cost for that route) and, notably, expected accident costs were the single largest source of external cost (~25% of the total external cost). The second variation lays out the external cost of the same shipment but using a more circuitous route over better roads. This time, the externalized cost was estimated to be roughly 1996USD 44 (~8% of the representative carrier's trip cost) and accident costs were the second largest source of external cost (~25%) (National Research Council, 1996).

318. In both cases, these estimates are not Australian, have not been adjusted for inflation, have not been adjusted for increases in the value of statistical life, and represent a *single* trip along a *single* route. However, methodologically they show that a significant portion of transport costs are externalized in developed countries and that accident costs represent a substantial portion of the social cost generated by RT services. In fact, of the RT-based case studies included in the report, crash costs were more often than not the largest source of external cost (National Research Council, 1996). Consequently, to the extent that pay is related to safety, the reduction of crash incidence promises to be a non-trivial source of social net-benefit from safe rates policies.

7.3. Truck Driver Pay, Economic Pressure, and Safety Performance

319. Research on the economics of truck safety largely started in Australia with work done by Hensher et al., which, among other things, identified a relationship between remuneration, work pressure, and truck driver safety behaviour (Hensher & Battellino, 1990; Hensher et al., 1989; Hensher et al., 1991; Hensher, Daniels, & Battellino, 1992). Shortly after, the General Accounting Office (GAO) of the US Congress investigated the link between changing economic conditions, stemming from the deregulation of the trucking industry, and safety performance (General Accounting Office - U.S. Congress, 1991).[9] The GAO hypothesized that increased competition, stemming from deregulation, would have a negative impact on motor carrier safety performance by reducing driver wages and, therefore, the average quality of drivers. Additionally, they believed that increasing economic pressure would discourage driver compliance with safety regulations, discourage managerial emphasis on safety practices, and encourage the deferral of truck maintenance. The data seemed to agree with the GAO's model and, indeed, carriers in the weakest financial position were found to have the highest accident rates. Unfortunately, the Department of Transportation rejected the GAO's findings and, consequently, research in the US stalled.

320. Research picked back up in the late 1990s, when the Office of Motor Carriers of the Federal Highway Administration funded the first major research on 'safe rates' in the US. The project's report was the first to establish a general connection between compensation and truck safety outcomes in the US (Belzer et al., 2002). This report was discussed at length in chapter 6.

321. Around the same time, Professor Michael Quinlan, of the University of New South Wales, conducted an intensive study of the underlying cause of Australian interstate truck crashes. Among other things, he concluded that the externalization of safety costs acted as an implicit subsidy for freight rates, that extreme competition in the presence of externalized safety costs contributes to an environment where failure to abide by safety standards can deliver an economic advantage, and thus amplifies the capacity for performance based payment systems to encourage unsafe behaviour (Quinlan, 2001; Quinlan & Wright, 2008).

322. Drivers often face significant pressure to deliver loads on time, despite exposure from exogenous factors that may hinder their ability to do so (e.g., weather, traffic, (un)loading time, supply chain delays, and more). This increases driver stress, discourages rest (i.e., contributes to fatigued driving), and encourages speeding behaviour, all of which is unsafe (Belzer, 2018; Braver, Preusser, & Ulmer, 1999; Quinlan & Wright, 2008). Of course, piece rate compensation, whether it be trip or distance

[9] Administrative deregulation of US interstate trucking began in the late 1970 and was ultimately codified by the Motor Carrier Act of 1980. In 1994, the Federal Aviation Administration Authorization Act extended deregulation to intrastate carriage. Among other things, deregulation contributed to a wave of new entrants – particularly in the for-hire truck load space – which increased competitive pressure and, by extension, reduced profitability.

based, and the lack of non-driving pay, only makes things worse (Belzer, 2018; Hensher & Battellino, 1990; Kudo & Belzer, 2019; Quinlan, 2001; Quinlan & Wright, 2008; Thompson & Stevenson, 2014; Thornthwaite & O'Neil, 2016; Williamson, 2007; Williamson & Friswell, 2013). Piece rate compensation also reduces the cost of delay felt by the carrier and, therefore, their incentive to 'punish' freight owners for freeriding on drivers' time. This invites delays, reduces productivity, and further agitates compliance/safety incentives, which, ultimately, leads to crashes (Office of the Inspector General, 2018).

323. Finally, as discussed in chapter 5, better pay also promises to attract better drivers and motivate existing drivers. Naturally, this should improve safety performance, in and of itself (Belzer et al., 2002; Ju & Belzer, 2024; Monaco & Williams, 2000; Daniel A Rodriguez et al., 2006; Ryley & Belzer, 2024).

7.4. Truck Driver Pay, Working Conditions, and Health

324. The literature explicitly connecting pay to truckdriver health and wellbeing is relatively small. This is not to say that such a link does not exist or even that it is insignificant. Instead, the primary issue is that it is simply difficult to measure.

325. For starters, there is a considerable amount of background noise to contend with. Among other things, truck drivers struggle with loneliness, depression, musculo-skeletal disorders, fatigue, obesity, diabetes, cardiovascular disease, and cancer (Apostolopoulos et al., 2010; Birdsey et al., 2015; Chau et al., 2013; Sieber et al., 2014). However, it is unclear what portion of this is due to pay and, for example, what portion is simply due to the nature of the job. After all, driving a truck for long periods of time, working long hours, spending most of your time alone, and eating on the road is not conducive to a healthy lifestyle. At the same time, money is essential to fulfilling our basic needs for survival and comfort (food, shelter, clothing, medical care, and family support). When pay is not high enough to satisfy basic needs, the lack of money can create allostatic load (see paragraphs 269 to 271) and, over time, this can lead to morbidity. Furthermore, low pay can result in limited access to medical care and missed opportunities for treating and/or detecting treatable conditions (often ones amplified by allostatic load).

326. Truck drivers also face considerable economic and time pressure (Belzer, 2018). Naturally, this increases stress, which contributes to allostatic load, and, by extension, the probability of developing morbidities (Apostolopoulos, Peachey, & Sönmez, 2011; Apostolopoulos, Sönmez, Hege, & Lemke, 2016).

327. Finally, truck drivers work long hours that, at least in part, is due to low and precarious compensation (Belzer & Sedo, 2018). This means that drivers spend a considerable amount of time sitting, which is associated with a higher likelihood of obesity, cardiovascular disease, diabetes, and even cancer (Chau et al., 2013). Long hours also suggest that drivers have increased exposure to chronic fatigue (Hege et al., 2015). This creates allostatic load and, thus, is detrimental to health (Czeisler, 2015). Yang, Schnall, Jauregui, Su, and Baker (2006), Chankaramangalam, Ramamoorthy,

Muthuraja, Saravanan, and Rajan (2017), and Kudo and Belzer (2020) all found that longer work hours are positively related to the risk of hypertension in truck drivers.

328. In conclusion, there is reason to believe that better truckdriver compensation will lead to healthier drivers in the long run and, by extension, help to reduce the burden on the healthcare system, which is external to contractual chain pricing.

7.5. Supply Chain Fissure, Subcontracting, and Safety

329. In the last 50 years, the RT industry has become characterized by relatively low barriers to entry, high levels of business turnover, the presence of many small carriers, and extreme competition. At the same time, the consumers of RT services seem to have consolidated (Mayhew & Quinlan, 2006; Rawling et al., 2017; Rawling & Kaine, 2012; Thornthwaite & O'Neil, 2016). Furthermore, advances in information technology have encouraged leaner inventory management strategies and the proliferation of complex contractual chains. This has paved the way for many large RT operations to become 'logistics firms ', which increasingly outsource delivery to smaller outfits and subcontracted drivers (Mayhew & Quinlan, 2006). Meanwhile, subcontracted drivers, and carriers, are left to fend for themselves against the bargaining power of logistic firms, the consolidated interests at the top of the contractual chain, and the entities occupying the intermediary links.

330. Due to intense competition, the externalization of safety and health costs, and a relative lack of bargaining power, subcontractors often face significant pressure to underbid. They also are more likely to be paid piece rates, drive longer distances, work longer hours (Williamson et al., 2009), experience more occupational violence (Mayhew & Quinlan, 2006), and take less time off work to seek medical attention (Thornthwaite & O'Neil, 2016). This kind of arrangement promises to erode work conditions for owner operators, subcontractors, and, because they are often substituted for one another, employee drivers. This is not safe (see Hensher & Battellino, 1990; Hensher et al., 1991; Quinlan, 2001, 2008; Quinlan & Wright, 2008; Rawling & Kaine, 2012; Thornthwaite & O'Neil, 2016).

331. Traditional labour standards policies are poorly suited for this kind of dynamic, as they concentrate enforcement effort on the level where the violation occurs instead of where the violation is encouraged (Fudge & Zavitz, 2006; Hardy & Howe, 2015; Weil, 2011). This treats the symptom instead of the disease. Thus, in situations like this, efficient labour standards need to take the verticality of the industry into consideration. As implied above, safe rates policies, which, among other things, aim to impose a 'chain of responsibility', are designed to do just that (Rawling, 2019; Rawling & Kaine, 2012).

7.6. The Curious Case of Owner Operator Safety Performance

332. Owner driver safety performance represents a bit of a puzzle for the motor carrier safety literature. On one hand, some scholars contend that asset ownership should provide a greater incentive for owner operators to drive carefully and maintain their equipment (e.g.,Dammen, 2003; Hubbard, 2000; Nickerson & Silverman, 2003). On the

other hand, a reliance on subcontracting to owner-drivers and owner-operators just to reduce price may also serve to increase economic pressure and, in doing so, provide a greater incentive to sacrifice safety for revenue (Belzer & Swan, 2011; Braver et al., 1992; Cantor, Celebi, Corsi, & Grimm, 2013). Indeed, the evidence as to owner operator safety performance is also mixed. Some studies find that owner operators, and carriers making greater use of owner-operators or owner-drivers as contractors, have higher accident and violation rates (Thomas M Corsi, Fanara, & Jarrell, 1988; Mayhew & Quinlan, 2006; Miller et al., 2018; Monaco & Williams, 2000). At the same time, some studies also found that owner operation had no impact on safety outcomes (Braver et al., 1992; Bruning, 1989; Soro et al., 2020) or even that owner drivers tended to have better safety outcomes (Britto et al., 2010; Dammen, 2003; Soro et al., 2020). One potential explanation for the variation in results is how different studies define owner operator. Owner operators are not all the same and depending on each researcher's definition and classification of a driver, we may get different results. (See Miller et al. (2018) for a more comprehensive review of the literature.)

333. On balance, the evidence seems to tilt in the direction of owner operator use being associated with worse safety performance. However, the majority of this work is based on US RT. To our knowledge, the most recent empirical work on Australian owner drivers and subcontractors was done by Soro et al. (2020). They found that, when controlling for compensation and other demographic variables, Australian owner drivers had somewhat lower odds of crash involvement than employee drivers and that subcontracting had no impact on crash involvement relative to employee drivers.[10] Instead, they found that base-pay type and payment for (un)loading time, not occupational classification, was most predictive of crashes. In other words, the differences in safety outcomes between employee and non-employee drivers arise because of the differences in compensation type and in payments for (un)loading time.

334. However, Soro et al. (2020) omit cases involving fatal crashes. Only if the omission of fatal crashes results in something akin to 'observations missing at random' would this not bias the results. On the other hand, bias could be introduced if owner drivers and/or subcontractors are serially more or less likely to experience them. At the same time, to the extent that pay structure is revealing of freight owners' overall safety culture and is systematically related to the difference in safety incentives between owner drivers, subcontractors, and employee drivers, the inclusion of compensation may wash away a portion of the 'treatment effect'– or at least the surface level manifestation of it. This logic would also imply that, as with employee drivers, the data generating process behind owner driver and subcontractor safety performance is very sensitive to economic incentives.

335. Miller et al. (2018) are the first to put forward a theoretically grounded analysis of owner driver safety behaviour based on differences between employee driver and owner drivers' economic incentives. According to Miller et al. (2018), ownership causes owner-operators to endure greater economic strain than employee drivers and, to compensate

[10] Owner operators and subcontractors can be distinguished by ownership of the vehicle. Specifically, owner drivers are 'subcontracted' drivers who provide their own vehicles. Meanwhile, subcontractors are 'subcontracted' drivers who use their employer's vehicle.

for the cost of equipment, they also receive higher rates than employee drivers. This increases the return for non-compliance. Meanwhile, managers do not have the same ability to influence owner driver behaviour after hiring. Thus, if the cost of non-compliance is roughly the same between owner drivers and employee drivers, or at least not large enough to offset the difference in economic pressure, the net-return for non-compliance will be greater for owner drivers. In which case, one would expect them to be systematically less compliant with safety regulations (Miller et al., 2018).

336. In practice, the extent to which these preconditions are true is debatable. Either way, however, this would tend to suggest that freight owners, and carriers looking for subcontractors, that do not put much value on safety when shopping for carriers will contribute to poor road safety outcomes. This is important because, at least under traditional labour standard enforcement policy, freight owners have less of an incentive to pay attention to safety performance. Similarly, to the extent that they do not share in the cost of poor road safety outcomes, freight owners have less of an incentive to police their role in creating work conditions that influence it. Presumably, the effects of this should also be exaggerated by the increased fragmentation of RT supply and the continued consolidation of RT demand – as this will ultimately cause freight owners and logistics firms to accumulate more leverage in the bargaining process.

7.7. Monopsony Power

337. Externalities are not the only source of economic inefficiency. For example, any deviation from 'perfect competition' should be associated with some loss of economic efficiency as well.

338. Perfectly competitive environments are defined by relatively homogeneous products/services, no barriers to entry and exit; a large number of relatively small buyers and sellers; and, most importantly, the absence of individual pricing power — both sides are 'price takers'. Economists call pricing power on the supply side 'monopoly power', while they refer to pricing power on the demand side as 'monopsony power'.

339. The literature makes it abundantly clear that the suppliers of RT services are price takers. However, it is dubious whether some freight owners (clients, or individual consumers of RT services) are devoid of pricing power. Certainly, the struggle of relatively small carriers against consolidated interests at the top of the contractual chain, and the pernicious effect of the combined pressure from the intermediary links, is a common theme in the literature (Mayhew & Quinlan, 2006; Rawling & Kaine, 2012; Thornthwaite & O'Neil, 2016). As alluded to above, presumably, owner drivers, and subcontractors, would be the most disadvantaged in this situation and, given the difference in incentives, the most affected by the 'pay and safety relationship'.

340. Drivers in monopsonistic markets receive incomes below what they would receive in a perfectly competitive market. The potential for monopsony among clients could help explain the simultaneous existence of low incomes, poor safety and driver shortages. At least among employee drivers, barriers to entry are small (only the owner-

drivers have to engage in the expense of truck purchase), yet new employee drivers do not enter in adequate numbers to offset retirements and other exits, because wages for employees are kept low. Wages in turn may be kept low by the 'race to the bottom' provided by some contractor- and owner-drivers, which in turn (as mentioned) reduces the number of 'peaches' and reinforces the 'lemon' wages paid. Rate floors can, again, raise the volume of work undertaken by drivers, if some are withholding labour (e.g. by leaving the industry) due to inadequate rates.

341. According to textbook microeconomic theory, monopsony power causes inefficiently low prices, inefficiently low market volumes, and deadweight loss, a cost to society arising from market inefficiencies (Manning, 2011, 2013). In this case, establishing minimum freight rates could transfer extracted producer surplus from freight owners back to carriers, increase the volume of freight moved, and, by eliminating deadweight loss, increase net social benefit (i.e., 'economic surplus'). At the same time, establishing a chain of responsibility should remove the ability of freight owners to wield their economic mass, and use their position in the contractual chain, in such a way that compromises road safety.

7.8. Conclusion

342. The primary social benefit from rate floors is improved safety performance. This should happen on two fronts. First, sustainable pay should attract better drivers, discourage longer work hours, and reduce economic pressure. Second, establishing a chain of responsibility should prevent freight owners and, to a lesser extent, logistics firms, from using contractual chain complexity to avoid their responsibility in road safety outcomes. This all also promises to reduce truck drivers' allostatic load, which should reduce the incidence of morbidities, and, in doing so, reduce the burden on the healthcare system.

343. Of course, externalities are not the only source of deadweight loss. A shortfall in competition can create economic inefficiency as well and, in this case, there is some reason to believe that individual consumers of RT services may be able to exercise a non-trivial amount of pricing-power. Indeed, market power has been a long-standing concern in the industrial organization literature.

344. In terms of textbook microeconomic theory, markets are prone to overproduction at an inefficiently low price point in the presence of a supply-side negative externality. This is because some of the costs of production escape the transaction and, therefore, the internal cost of the activity is artificially 'cheap'. Overproduction due to under-pricing of labour in road transport can lead to higher crash risks for professional drivers, non-involved drivers and passengers, and other externalities such as pollution, excessive carbon emissions, and congestion,

345. In the case of non-trivial buyer-side pricing power (i.e., monopsony power), markets are prone to under production at an inefficiently low price point. Thus, in the presence of both negative externalities and monopsony power, textbook theory would

suggest that rate floors could increase social net-benefit. They may also increase market volume (e.g., the number of drivers hired, the amount of freight moved, etc.), but this would depend on the size of the external cost that is put back into the transaction relative to the reduction of individual consumers' pricing power.

346. To add further complexity to the issue, in this case, because remuneration, health, safety, and work conditions are all intertwined, the inefficiency generated by the externality and any monopsony power present likely feeds off each other. However, to the extent that a rate floor policy would establish minimum sustainable rates *and* create a chain of responsibility, it should be well positioned to address both issues and, in theory, increase economic efficiency.

347. To the extent that higher remuneration may put any upward pressure on freight prices, as it stands, they may be inefficiently low to begin with. Furthermore, as discussed in the previous chapter, at least some of this would be offset by hiring efficiencies, a more motivated labour force, and reduced dwell time, as well as higher productivity. Moreover, even if the explicit cost of freight increases, a priori, it is not clear that this would be a net-loss. For example, to the extent that pay and health are related, better pay promises to reduce the burden of low road human resource management practices on the health care system and, perhaps more importantly, to the extent that pay and safety are related, better pay promises to reduce the collateral damage created by truck crashes.

348. At the end of the day, everyone has to pay for low road human resource management practices – especially when production takes place in the public space. Thus, it is not a question of whether or not we want to pay for it - we already are. Instead, the better question is, how should we split the bill?

8. Research Road Map

8.1. Introduction

349. This chapter outlines the research that should be undertaken in response to the gaps identified in the preceding parts of this report.

350. In order to entice new drivers to enter the industry, commercial driving needs to be an attractive occupation. Compensation is an important part of this. Of course, driver earnings are set by market forces and, in theory, a well-functioning market should already fully account for work amenities, including safety conditions, in its equilibrium process (Rosen, 1974; Thaler & Rosen, 1976). However, the evidence that this actually happens is mixed (Manning, 2013). Furthermore, to the extent that truck crashes have the potential to generate external costs, driver pay may not fully internalize safety performance. In the presence of an externality, there is no reason to expect driver labour markets to achieve allocative efficiency when left to their own devices. In situations like this, establishing minimum sustainable rates and a chain of responsibility would improve economic efficiency.

351. This is a contentious proposition in many policy arenas. There is a natural concern that establishing sustainable rates could be inflationary and create deadweight loss. However, upon closer inspection, this does not seem so. Indeed, the purpose of this report is to demonstrate that safe rates do not necessarily reflect a mere transfer of rents to RT drivers, as they are often characterized, but, instead, can be beneficial to society.

352. Economic variables do not operate in a vacuum, so, while safer rates may set minimum prices, this does not necessarily mean that higher rates represent a net-cost to society. For example, as discussed in Chapter 4, sustainable rates promise to increase the productivity of the RT sector. They also promise to reduce truck crashes, which, because RT production takes place in the public space, is a cost that we all share.

353. In the preceding chapters we have demonstrated that there is extensive theoretical and empirical precedent behind the assertion that price pressure created from safe rates, better work conditions, and high road human resource management practices could be directly offset by the increased productivity of motor carriers and indirectly offset by increased economic surplus. To do this, we have cited over 80 years of peer-reviewed literature from different academic disciplines (e.g., industrial psychology, supply chain management, human resources management, economics, and others) and countries (e.g., Australia, the United Kingdom, India, the United States, and others). However, to our knowledge, this has not been tested longitudinally in Australia. Indeed, these effects have been studied minimally worldwide. In this chapter, we will lay out a research agenda intended to fill in this gap and to test the effects of policy interventions designed to remedy this problem.

8.2. Initial research agenda for the lead-up to the determination of remuneration

354. In the lead up to the first major FWC case considering how to implement the powers given the FWC to set appropriate rates in the road transport sector outside the employment relationship, it would be appropriate to have available research evidence on the effects of such RTR.

(a) Implications of the analysis to date

355. From the preceding chapters it should be apparent that:

- There is a body of international evidence, theoretical and empirical, showing that appropriate (higher) remuneration in the RT sector leads to improved safety outcomes. 'Safe rates' lead to better safety. There is also evidence from Australia (based on the comparison of NSW under Chapter 6 with the rest of Australia) showing the same thing. This is despite the way that confidence in an Australian relationship was weakened by the experience of the RSRT, which had been in place for too short a time for proper evaluation, but which it had been (incorrectly) asserted showed the absence of a 'safe rates' relationship. We know, from the evidence, that higher labour income leads to substantially better safety outcomes, but we don't know by precisely how much.

- There is also a body of theoretical and empirical evidence of a relationship between higher pay and improved private outcomes for the firm, through impacts on hiring costs, shirking, and productivity.

- The evidence is strongly suggestive that a more efficient allocation of resources, and reduced incentives for risky behaviour, would occur if drivers were paid adequately for all their time (including non-driving time), though we do not have direct Australian evidence that quantifies the relationship between pay and such outcomes.

- Broadly speaking, the data enabling a quantitative estimation of the price impact of RTR do not really exist. We can be confident that the impact on aggregate price levels across the economy, and hence on inflation, would be very small. But beyond that, it is difficult to quantify exactly what the impact on transport prices would be.

- We can estimate moderately confidently the number of employee and non-employee truck drivers in Australia.

- However, we cannot estimate the labour income gap between employee and non-employee drivers and, if a floor on non-employee earnings were to be recommended that was functionally equivalent to the relevant award rate, we have no way of estimating the proportion of non-employee drivers who would fall below that threshold, and by how much they would fall below it.

- We can estimate the value of production in the road transport industry in Australia.

- We have little empirical basis for calculating the pass-through to prices of cost increases arising from RTR affecting labour income for non-employees.

- Publicly available data at the state level (to enable NSW to be compared with the rest of Australia) are limited by small sample cell sizes, and often not even available.

- Data to enable retrospective comparisons to be made of the effects of the RSRT are either unlikely to be held, or unlikely to be very useful, given the short life of that tribunal.

356. As a consequence, it is impossible to build a general equilibrium model currently that would enable us to accurately quantify all the effects of RTR in Australia, to produce fairly quickly an estimate of the net impact on national welfare. Looking at the longer term, it would be possible, however, to collect data across Australia that would incorporate key variables with which a definitive study could be established to determine, over perhaps a four or five-year period, the relationship between remuneration and safety.

357. Further primary research might enable some or most of the gaps to be filled, and a model to be developed. But we wonder whether that would be a worthwhile exercise. It would be very costly, and still rely on various assumptions to enable the model to be resolved. For example, estimating the labour income gap between employee and non-employee drivers and the proportion of non-employee drivers who would fall below that threshold, and by how much, would require a very large survey of non-employee drivers with no guarantee of cooperation by targeted participants and extensive, expensive analysis. Such research would be tractable but require a fairly high level of commitment. Importantly, that would be only part of the requirement for putting a comprehensive model together.

358. A more productive approach in the short run, we believe, would be to undertake intra-firm and inter-firm studies showing the actual impact of RTR, with attention to the situation in NSW vs the rest of Australia. That would address the *effects of* the data deficiencies discussed above, but instead of remedying them all it would construct a picture of the total effect of RTR in an Australian context.

359. The proposed study is outlined below.

(b) Pre-hearing study of effects of road transport regulation

360. The object of the study would be to assess the impact of existing RTR (via NSW Chapter 6) on firms and drivers in Australia. It would have two units of analysis — the firm and the drivers. If only one were possible, either would provide rich data, but the data from the two levels would only partially overlap (that is, some data could only be obtained from one source or the other), so the picture would be far less comprehensive.

One or more firms (preferably three) would be studied, though in the discussion below they are just referred to uniformly as 'the firm'. The analysis would be both qualitative and quantitative. The two elements are set out below:

The firm level

361. The firm would be one that operates in both NSW and other states. Thus, an important (the first) aspect of investigation would be differences between operations in NSW (for intra-state transport) and in other states (or for transport between NSW and other states, i.e. transport not regulated by Chapter 6). (For brevity, this last category is referred to as Rest of Australia [ROA]). The second aspect of investigation would be whether the NSW experience has had any impact on management of drivers in other states and, if so, what that impact as been.

362. NSW would be the most useful policy example to look at because it contains the only current policy framework in Australia that is comparable to the new federal jurisdiction arising from the 'Closing Loopholes' legislation and has been in place long enough for valid comparisons with other jurisdictions to be made. While it is not identical to the 'Closing Loopholes' framework, it is based on the same guiding legal principle (of permitting regulation of workers outside the employment relationship) and policy focus (on broadly equalising remuneration inside and outside the employment relationship, while protecting safety, efficiency and the viability of road transport businesses). It is capable of being investigated. Arrangements in two other states (Victoria and Western Australia) lack the legal principle and policy focus, while the only other federal legislative initiative that is comparable to the 'Closing Loopholes' framework, the RSRT, was too short-lived to be evaluated and ended too long ago for firms and drivers to hold meaningful data about it. It would not be possible to evaluate the 'Closing Loopholes' provisions before they even come into effect. And a comparison of NSW and ROA would enable assessment to be made of the potential effects of real world policy options that might be considered by the FWC.

363. This study would involve:

a) Qualitative interviews with key managers.
    - These interviews would encompass:
        - Whether there are any differences in their handling of drivers in NSW and ROA, e.g. on matters such as use of employees vs contractors/owner drivers, terms etc
        - The history of their handling of drivers in NSW and ROA
        - Payments in NSW and ROA
        - Various terms and conditions in NSW and ROA, including terms and conditions for metropolitan, intra-state and inter-state road transport
        - Whether they see any differences between NSW and ROA in:
            - Delivery time
            - Driver reliability
            - Accident rates and other safety indicators
            - Vehicle reliability

        - Driver turnover
        - Other indicators of cost or productivity
    - The interviews would be undertaken with managers who would be in the best position to answer these questions, but would be expected to include:
        - CEO
        - HR manager or manager in charge of hiring contractors
        - Operations manager in charge of scheduling
        - Site managers in several locations, preferably at least two in NSW and two in ROA

b) Collection of objective quantitative data, for example:
    - Payroll data
    - Payments to contractors or owner drivers
    - Driver contracts
    - Objective data on
        - Delivery time
        - Driver reliability
        - Accident rates and other safety indicators
        - Vehicle reliability
        - Driver turnover
        - Other indicators of cost or productivity

364. Both (a) and (b) are highly desirable, but if a participant firm were able to cooperate with (a) but only parts of (b), or only with (a), then that would be better than nothing. The results would still be valid and important, though perhaps not as persuasive to the FWC as the full study with both (a) and (b).

The driver level

365. For this, data would be collected from drivers by two methods:

c) Quantitative survey

All drivers who had been used for more than two days in the preceding six weeks would be sent a survey. The choice of mode (paper vs online) would be finalised after further consultation and possible pre-testing. This would seek information on their perceptions about:

- Pay
- Working hours
- Other conditions of employment
- Job security
- Safety and health
- Vehicle reliability
- Management
- Job tenure for this and some set of prior jobs
- Intention to leave

d) Qualitative interviews

At least six drivers (at least three from each of NSW and ROA) would be (randomly) selected for in-depth interviews about the above issues, and about their perception of the impact that form of contract (employee vs owner-driver/contractor) has on their wellbeing.

366. Ideally, the sample for the driver survey (really, a census) would be drawn from the same firms as participated in the firm-level study of managers and objective data referred to in paragraph 363 above. This would very likely lead to a much higher response rate than if a general driver survey were undertaken, as the firms would themselves be able to encourage participation, and it would provide a knowable population (all drivers from firms X, Y and Z). Also importantly, it would enable linking and triangulation of data from different levels.

367. A fallback option would be a survey of drivers not restricted to those firms, though this would raise difficulties about describing the population and gaining access to a suitable list or lists. This would also have a lower response rate, but would nonetheless provide better data than presently exist in Australia.

Numbers of cases

368. The studies would be undertaken in, preferably, three firms. (This would enable anonymity of responses to be assured.) Assistance in enabling access to firms would be crucial to the success of the project. The number of drivers studied would be considerably higher, possibly in the hundreds or thousands.

Alternative

369. An alternative approach might be to do the study exclusively within NSW firms, comparing before and after Chapter 6 regulation in NSW IR Act. However, we dismiss this option as it is so long since chapter 6 came into effect it is doubtful that the corporate memory or data would exist to make useful comparisons. Similarly, it is unlikely that a study focused on comparing before and after the RSRT came into effect would yield useful data, not only because of the passage of time but also especially as its regulations were in place for such a short period.

Other effects

370. Aside from investigating the policy-and safety-related issues already alluded to, such a study would have other benefits. It would provide in-depth information to enable a better understanding of the detailed operation of the sector, including such questions as the differences and similarities between the situations of short-range (for example, within a metropolitan area), inter-city intra-state and inter-state road transport. This is especially pertinent as the short-trip sector has historically been under-researched, especially in Australia, and especially by comparison with the long-distance sector within road transport.

8.3. Towards a Better Understanding of the Internal Effects of Minimum Sustainable Rates

371. In this section, we consider research that could be supervised and commissioned during the hearing process, by the FWC or another agency.

372. There is no universal measure of 'productivity' nor is there a universal method for measuring it. Pre-made aggregable productivity metrics are not available. Consequently, these will have to be constructed. Fortunately, there is a large literature in economics that details how to do this. For the purposes of this discussion, we will focus on three different constructs: technical efficiency, cost efficiency, and drivers' net present value.

(a) Technical Efficiency Analysis

373. In economics, technical efficiency measures the relationship between physical inputs and the amount of output generated with those inputs. Specifically, a technically efficient outcome is a situation where the maximum amount of output is obtained from a set of inputs. However, in practice, it is difficult to know precisely the 'maximum amount of output'. There are two ways around this.

374. The first is to compute total factor productivity and, from this information, make an inference about the firm's journey towards, or away from, technical efficiency. In econometrics, total factor productivity is typically defined as the portion of a company's increased output that cannot be directly explained by its inputs. The higher this is, presumably, the more efficiently the firm must be using their physical inputs and, thus, the closer to technical efficiency they must be. In this way, we can infer whether or not a particular policy intervention increased technical efficiency by observing whether or not it caused total factor productivity to increase.

375. The second approach is to identify the 'maximum output' based on the observed production of peer-firms. For this approach, the maximum amount of output for any given set of inputs is established by the firms in the industry producing the most output with each input bundle. Using this method, we can infer whether a particular policy intervention increased technical efficiency by observing its effect on the distribution of firms' outputs at each input level.

376. Both approaches have their strengths and weaknesses. For example, production functions have a well-established theoretical foundation. However, they are ill-equipped to handle situations where firms produce multiple types of output or undesirable output, such as crashes. On the other hand, relative efficiency based methods (e.g., data envelopment analysis) can handle both multiple output types and undesirable output (Halkos & Petrou, 2019). However, the relative nature of the efficiency score makes them hard to interpret over time and between samples.

Fortunately, both approaches require very similar data and, thus, if one is estimated, there is a very high likelihood that the other can be estimated as a robustness check.

377. In order to perform this analysis, we require information about carrier inputs, output(s), vehicle miles travelled, safety performance, input costs, specialization (i.e., truck load or less than truckload), and whether carriers operate on an interstate or intrastate basis.

(b) Cost Efficiency Analysis

378. While technical efficiency is important, it does not consider the cost of materials – just output per input. Depending on differences in input costs between carriers, technically efficient input and output bundles may not be cost efficient or profit maximizing. It also may not count externalities--costs that price (freight rate) does not cover--but which have social consequences and consequences for economic welfare. Cost efficiency analysis has attractive features where the incorporation of undesirable outputs is concerned. To the extent that safety events are heterogeneous and more severe safety events tend to cost carriers more, grappling with them in terms of cost, instead of just count and type, allows for the analysis to organically accommodate a wider spectrum of events and consequences. In this way, cost efficiency analysis provides a slightly different perspective on productivity and, by extension, complements the technical efficiency analysis discussed above.

379. In the trucking literature, cost efficiency has often been analysed using stochastic frontier analysis (see Aigner, Lovell, & Schmidt, 1977) to estimate carrier cost functions. In particular, this approach received considerable use in the aftermath of US motor carrier deregulation. For example, Allen and Liu (1995) use stochastic frontier analysis to estimate the cost efficiency of US less-than-truckload motor carriers' 'total ton mile' production between 1985 and 1989. For inputs, they use average load per vehicle mile, average length of haul, an index of service quality (taken from a periodical), the price of labour (total labour cost divided by number of employees), the price of fuel, the price of oil, the price of rented transport, the price of purchased transport, and the price of capital. With sufficient data, safety event and compliance costs should be included as well.

380. Cost efficiency analysis is attractive because it allows us to quantify the productivity effects of a policy intervention (like a rate floor) in dollar terms, it has an intuitive interpretation, it can more organically accommodate heterogeneity in safety outcomes, and it will act as a robustness check for the technical efficiency analysis. In order to perform this analysis, one will require information on carrier input usage and cost. Note, much of this overlaps with the data requirements for total factor productivity analysis. Thus, there is a high likelihood that satisfying the data requirements for total factor productivity analysis will enable a complementary cost efficiency analysis as well.

(c) Net Present Value Analysis

381. Productivity can also be defined using any number of proxy metrics. For purposes of this discussion, we recommend analysing changes in drivers' net present value. For example, Faulkiner and Belzer (2019) compare the net present value (i.e., discounted net-revenue) of different types of drivers at a large US truckload motor carrier. With sufficient data, this approach could be generalized to the industry level.

382. If the intervention in question pertains to driver pay and does not affect the rates carriers charge for hauling cargo, then we can infer that any changes in drivers' net present value would be the result of changes in drivers' marginal product of labour and safety costs. In which case, any change in net present value would signal changes in productivity and, equally important, profitability. If carriers are simultaneously charging higher prices for RT services, it would be unclear to what extent the change in net-revenue was generated from changes in drivers' marginal product, safety costs, and/or higher prices. However, presumably, this issue could be bypassed by artificially holding the rates for RT services constant in the net present value calculation and only increasing driver wages.

383. The overarching idea here would be to extract driver level data from participating carriers, run driver level net present value estimations for every carrier, and then calculate the average net present value for drivers at each carrier (keeping all driver and trucking company information confidential). This will allow us to document changes in driver profitability surrounding the imposition of the rate floor - or some other policy intervention.

384. This approach has many attractive features. For one thing, it can directly incorporate driver safety costs. Traditional total factor productivity and, to some extent, relative technical efficiency analysis struggles with this. While stochastic frontier analysis can also be used to compute cost functions and even profit functions, the estimation of canonical cost functions is subject to the same endogeneity problems that plague production function analysis. Meanwhile, the calculation of drivers' net present value proposed here, being done at the driver level, takes the carriers' choice of inputs as given and, by extension, avoids the endogeneity problem. Furthermore, changes in net present value should also communicate changes in profitability and, presumably, will be the most interesting data point for our industry partners.

385. The obvious drawback to this approach is that the accuracy of the analysis depends on access to granular driver level data for all carriers in the sample.

386. In order to perform this analysis, we will need information on carriers operating income, insurance cost, insurance claim revenue, vehicle miles travelled, driver mileage information, driver safety performance information, safety cost (cost of crashes), training costs, and other administrative recruiting and hiring costs. While it may be possible to use carrier averages, perhaps gleaned from public financial records, or industry averages in places. However, the more we do this the less accurate the calculation becomes.

(d) Summary and Conclusion

387. The overarching question that we are trying to answer here is: how much does the imposition of a rate floor change productivity ? Of course, there are multiple ways to measure productivity. We propose estimating carriers' total factor productivity scores, relative technical efficiency scores, cost efficiency scores, and drivers' net present value. All of these approaches have their advantages and each accesses the concept of 'productivity' from a different angle. Thus, in our opinion, the most robust case would be made by estimating all of them. To our knowledge, longitudinal productivity analysis has not been done in the Australian trucking literature. Furthermore, the findings of such an analysis would have obvious policy applications. The findings would be interesting for all parties involved--trucking companies, truck drivers and their representative, and government policy-makers, while setting the foundation in research.

388. Productivity can be measured at any time, but, for purposes of this discussion, it would be most useful to do this in the years before and after a policy intervention (e.g., the imposition of a rate floor). This will provide a source of exogenous variation (i.e., a 'treatment'), which will enable the application of quasi-experiment research designs and, in doing so, allow us to better establish causation as opposed to simple correlation. This is important for policy evaluation purposes and, in trucking, novel.

8.4. Towards a Better Understanding of the External Effects of Minimum Sustainable Rates

389. For social benefit, there are two potential returns to establishing rate floors. The first is from the elimination of deadweight loss by reducing the externalized health and safety costs. The second is the increase in employment and freight volume created by counteracting monopsony power.

(a) Crash Cost Saving Analysis

390. To our knowledge, Steinhauser and Lancsar (2022) is the most recent and most detailed analysis of road crash costs in Australia. They estimate crash costs for the year 2016 through 2020. Unfortunately, they do not break down their average crash cost estimates by vehicle type or estimate the proportion of heavy truck crash costs that get externalized. To properly value the social benefit created by any improvement in motor carrier safety performance and, by extension, the efficacy of motor carrier safety policy, this should be calculated.

391. If suitable estimates of the cost of heavy truck crashes do not already exist, we will need sufficient crash information to manufacture these estimates ourselves. Among other things, modelling crash costs requires data on the number of occupants involved in crashes, the details of each person's injuries, the costs of those injuries, the number of fatalities, the cost of fatalities, insurance information, the cost of property damage, and the cost of travel delays.

392. If these more granular data are not available, heuristics can also be used to estimate crash costs and the portion of crash costs that get externalized. For example, Korzhenevych et al. (2014) suggests that the share of internalized costs can be well approximated by dividing the number of crash-fatalities inside a certain type of vehicle by the number of crash-fatalities in accidents involving that vehicle type. Similarly, the cost of injuries can be estimated by prorating the value of a statistical life (VSL). For example, Bickel et al. (2006) suggests that the cost of a severe injury is approximately 13% of the VSL; the cost of a light injury should be approximately 1% of the VSL; and the cost of direct and indirect social costs (material costs, administrative costs, production losses, pain suffering and grief, etc.) should be approximately 10% of the VSL.

393. With the economic cost of crashes, differentiated by the type of vehicle and type of crash, in hand and an estimate of each crash type's external cost, calculating social benefit is just a matter of computing the change in crash incidence associated with the policy intervention, multiplying this figure by the external cost of crashes, and then adding everything up to get the total crash cost savings generated by establishing minimum sustainable rates.

(b) A Note on the Other Sources of Social Benefit from Safe Rates

394. While perhaps the most significant source of social benefit, crashes are not the whole story. As discussed in Chapters 5 to 7, there are also health externalities to consider and the potential to eliminate deadweight loss from monopsony power.

The Social Benefit of Better Health from Better Work Conditions

395. As discussed earlier, there is a wealth of literature linking pay to health. However, it would be much more difficult to actually measure the cost/benefits here. This is because the confounders for health consequences are far more numerous, less observable, and, presumably, take more time to develop. Thus, there would be a need for longitudinal data on drivers' health records and, consequently, this may not be tractable. However, it is worth noting that the safety benefits estimated above are not the entire story. To the extent that better pay leads to better safety *and* better health, it follows that the safety benefits represent a conservative measure of the 'true' benefits from the policy intervention.

Monopsony Power, Dead Weight Loss, and Social Benefit

396. The employment relationship in a growing number of industries has become fissured. Lead firms have become separated from the actual employment of the workers who provide the goods and services. Meanwhile, the direct employers of the workers are often relegated to hyper competitive markets and face the bargaining power of increasingly consolidated interests on top of the contractual chain and the combined weight of intermediary links. RT is a prime example of this (Mayhew & Quinlan, 2006; Rawling & Kaine, 2012; Thornthwaite & O'Neil, 2016).

397. Monopsony power (i.e., demand side pricing power) creates deadweight loss, inefficiently low prices, and inefficiently low market volumes (Manning, 2011, 2013). Establishing minimum freight rates promises to transfer extracted producer surplus from freight owners back to carriers and thereby improve their economic viability; increase the volume of freight moved; and increase economic surplus (via the elimination of deadweight loss).

398. Monopsony power typically is measured by the 'rate of exploitation', which is, canonically, defined as the markdown between the marginal revenue product of labour and the wage employees typically receive. With some manipulation, this ratio can be shown to equal the reciprocal of the firm's labour supply elasticity. Thus, one can use the firm labour supply elasticity estimates to compute the rate of exploitation, and, by extension, the amount of monopsony power employers have (Manning, 2011, 2013; Webber, 2015). All else constant, the more monopsony power that exists, the more deadweight loss is created, and, therefore, the more net-social benefit that can be returned by creating a rate floor.

399. Monopsony power, to which we allude above, is typically measured in the context of employer and employee relationships. However, there is nothing about the underlying mechanism at work (i.e., individual buyer pricing power) that prevents the concept from being applied to other types of markets. This is important, because, in RT, the direct employers of truck drivers may not actually be the ones wielding the power. Instead, truck drivers' earnings are likely, indirectly, influenced by freight owners' pricing power and the bargaining power of other relatively large intermediaries. Thus, much the same way that computing firm labour supply elasticity reveals monopsony power in the labour market, computing the elasticity of RT supply for individual freight owners should reveal the extent to which RT providers face monopsony power and, by extension, take a 'markdown' for their services.

400. If this markdown is not trivial, it is a tell-tale sign of deadweight loss (an economic loss that can lead to structural inflation). In this case, theoretically speaking, we have another vector by which safe rates policies can increase social net-benefit. As far as we can tell, nobody has tried to measure this. Presumably, this is because the calculation requires detailed firm level data from freight owners – who have everything to lose by providing it. Thus, short of subpoena power, this endeavour may not be tractable. Even so, it is still worth pointing out that reducing negative externalities may not be the whole story here and, by extension, that the social benefits estimated via crash cost savings likely represent a conservative measure of society's net-return.

(c) Summary

401. The overarching objective here is to compute crash costs; if necessary, compute the amount of crash costs that get externalized; estimate the marginal effects of a safe rates intervention on the incidence of crashes; and then combine these figures to produce expected cost savings estimates in terms of $A.

402. The data requirements for computing crash cost savings are considerably lower than those of the productivity analyses outlined in the previous chapter, as crash and violation information is more readily available. It is also worth pointing out that there is considerable overlap between the two. Indeed, if there is enough data to perform the productivity analyses, there will almost certainly be enough data to execute the crash analysis as well.

403. As far as we can tell, the economic cost of heavy truck crashes has not been computed. This is a useful metric to have for the evaluation of motor carrier safety performance and regulation in general.

404. Conducting analyses before and after the implementation of the Closing the Loopholes legislation would resolve long-lasting political disputes over these policies.

8.5. Conclusion

405. In this chapter, we have proposed a research agenda centred around analysing the productivity and safety effects of a safe rates intervention.

406. Of course, the constructs that we are interested in measuring, productivity and safety performance, are abstract concepts. They do not have universal definitions and, particularly where productivity is concerned, they do not have readily available and aggregable measurements. For this reason, we recommend estimating and/or using multiple measures of both safety and productivity to reinforce one another. In the case of productivity, we recommend analysing changes in total factor productivity, cost efficiency, material efficiency, and driver net present value. In the case of safety, our primary focus is on measuring the change in the external cost burden of crashes. After all, this is the most tangible aspect of safety and, presumably, the most lucrative in terms of potential cost savings. However, as a robustness check, we also recommend that the effect of safer rates on compliance outcomes (i.e., violation incidence) be analysed as well.

9. Conclusion and recommendations

407. This report shows that regulation outside the employment relationship can lead to increased productivity, reduced other costs (e.g. of recruitment) and improved safety in road transport. Price increases are likely to be minimised (though we do not know by how much) due to increased productivity and reduced costs. The impact on inflation is likely to be very small. The social benefits of safe rates reduce or more than offset price effects. The rest of this chapter elaborates on these key findings.

9.1. Overview of the industry

408. The RT industry is characterised by extensive contract networks, featuring hierarchical contractual chains that leave many drivers at the bottom of contractual chains without employee status, and often with the debts associated with ownership of large articulated trucks. Digital platforms are also entering the sector, through grocery or food delivery, last- mile parcel delivery work and digital work allocation in even the heavy freight sector.

409. The industry also has a number of undesirable features: long working hours, low incomes, high debt, insolvencies, and numerous other risk factors for safety including isolation, sedentary work and poor access to healthy food. The industry experiences a poor safety record, while the drivers experience loneliness, depression, musculo-skeletal disorders, fatigue, obesity, diabetes and cardiovascular issues. Drivers report difficult working conditions, time pressures, and the recurring threat of death on the job. The industry has one of the highest fatality rates of any industry.

9.2. Key characteristics of road transport in Australia

410. We can make a number of observations about the road freight transport sector in Australia. First, around a decade ago, non-employee truck drivers accounted for about one in eight truck drivers. Most recently, that share has been closer to one in five. There is thus a steady underlying trend for the share of truck driving undertaken by owner-drivers and/or contractors to increase.

411. Second, the road freight transport industry has a low profit ratio. Profit as a proportion of revenue in road transport is roughly only one third of that nationally. It is one of the lowest-profit segments in the economy.

412. Third, the most prominent of those other industries, to which firms in road transport provide services are (in order): construction services, wholesale trade, retail trade, transport support services and storage, postal and courier pick-up and delivery service, residential building construction, and sheep, grains, beef and dairy cattle, as well as several manufacturing industries. Other industries, to which road transport

provides services, almost all experience higher profits than does road freight transport itself. Of course, many firms in road freight transport are contracted to provide services to other firms in road freight transport that are higher up the contractual chain.

413. Fourth, the road freight transport sector in NSW appears to have a smaller role for owner-drivers and/or driver contractors than does the rest of Australia, though owner-drivers remain significant. The reforms to remuneration policy in NSW have likely had some impact on the structure of the industry, but they have certainly not destroyed the owner-driver or driver-contractor sectors, which remain important in that state.

9.3. Regulation of the industry

414. While the employed component in the sector is often regulated, the contractor segment, near the bottom of the contractual chain, is mostly unregulated except in New South Wales, where chapter 6 of the *Industrial Relations Act 1998* enables the Industrial Commission of NSW to regulate payments for intra-state journeys. There has thus been an important regulatory difference between NSW and the rest of Australia.

415. This has not been the only attempt to regulate outside the employment relationship, to mitigate or overcome these problems. While Victoria and Western Australia passed laws that sought to have some marginal influence on business practices, by far the most significant example in Australia has been the Chapter 6 provisions of that state's Industrial Relations Act, which enable an industrial tribunal to set minimum standards for payments and conditions in the industry, and also provide some facilitation for bargaining between industrial parties. This legislation is in its fourth decade of life, having survived several changes of government. Research into its effects demonstrated a substantial long-term reduction in road deaths (it was estimated as leading to over 200 lives saved), but also showed a substantial short-term variation in road deaths (as road deaths have many causes), making short-term evaluations of legislative change near impossible.

416. At the federal level, the Road Safety Remuneration Tribunal was legislated into and out of existence before its effects could ever be properly or even tentatively evaluated. Most recently, the Closing Loopholes No. 2 *Act* has given the Fair Work Commission the same powers to deal with remuneration in the industry as have been given its NSW equivalent, plus some more to deal with contractual chain issues that the NSW tribunal has not had.

417. There are also international examples of attempts to regulate outside the employment relationship in this industry — in Korea (now lapsed after a change of government), Canada (Vancouver), Brazil, the United States (especially California, but in other states as well) and Europe (at national and cross-national levels). These experiments show both similarities and differences with the approaches taken to handle the problem of road freight transport. All sought to respond to the acknowledged fact that the issues with remuneration and conditions in the industry could not be dealt with simply by direct regulation within the existing employment

relationship. All recognised the relevance of the contractual chains and sought a variety of approaches to dealing with that central feature of the road freight transport industry. Each had similarities to some aspects of the Australian 'Closing Loopholes' approach. In addition, useful regulation of scheduling times has occurred at Port Botany in Sydney, with some similarities to arrangements in Brazil and Korea.

418. The Closing Loopholes legislation, like arrangements in Brazil, Vancouver and Korea, establishes a power for a state agency to directly regulate the payments to drivers of road freight vehicles. Like Vancouver and Korea, it allows for a decent income to be required for owner-drivers; indeed, it can be read as being akin to the Vancouver system that supports equal incomes between employment types. Closing Loopholes makes it easier for contractors to be defined as employees, though it does not (and the FWC cannot) go as far as California in that regard. Like some reforms in Europe, it prioritises the importance of the whole contractual chain, and the ability to put pressure on freight owners, the apex firms in the contractual chain, to do the right thing by the workers at the bottom of the contractual chain.

419. Overall, the experiences from other countries point to a number of lessons from overseas, including the desirability of:

- enabling bargaining or regulation outside the employment relationship, including on matters concerning remuneration of drivers, but also ensuring that workers who are genuinely employees are treated at law as if they are employees;
- enabling the relevant agency to take account of the need for drivers to earn a reasonable income, and not just recover their costs;
- encouraging the minimum standards for employees and contractors to be broadly equivalent in value, and so not giving preference to one business model over the other;
- having the capacity to regulate the contractual chain as a whole, in particular the role of freight owners, and not just the firms that directly engage drivers, enabling the freight owners to be held accountable for what happens in the contractual chain;
- enabling regulation to cover all participants in an industry in a jurisdiction, not just those who operate within a limited geographic area within that jurisdiction;
- recognising and giving legal force to agreements between unions and contractual chain participants, including freight owners;
- focusing on arrangements that have long-term sustainability and certainty, through entrenching a high level of consultation and avoiding sunset clauses;
- enabling indirect regulation of dwell time and other factors that may be influenced by the behaviour of freight owners.

420. The Closing Loopholes legislation is consistent with the first seven of those eight lessons. Its only weakness, when seen in international context, is in relation to the last point above: the exclusion of some matters that could otherwise be important in influencing freight owner behaviour, particularly the regulation of overtime and rostering. Overall, the 'Closing Loopholes' approach is the most advanced legislation

internationally in dealing innovatively with regulation beyond the employment relationship as it affects remuneration and hence safety and efficiency in the road freight transport sector.

9.4. Estimating the effects of progressing new regulation

421. It is not a simple task to precisely estimate the full effects from application of the 'Closing Loopholes' principles to road transport regulation in Australia. We have shown how the total or social effects of any event — a transaction or a regulation — can be broken down into private effects and public effects. The private effects are those that apply only to the parties to a transaction. Public effects are also referred to as externalities. These are costs or benefits that are borne not by the parties to a transaction but by others in society. When we consider the steps involved in estimating the price effects of road transport regulation outside the employment relationship, and the steps necessary to estimate the non-price effects, we find that the data to make these estimates are not fully available. Some are available here (and estimates have been made in the USA of some elasticities, drawing on data already available there) but some are not. For example, we have inadequate data to estimate, for Australia, the incomes of owner-drivers, and by how much they would be increased through a process of creating 'safe rates' or their equivalent. Even if it were desirable to estimate of a general equilibrium model of price effects, not all relevant data are presently available.

422. This is not to say that the nature of the effects of public policy here are unknown. Evaluations of public policy typically involve some comparison: of 'before' with 'after', of 'treatment' with 'control' groups, or both. Studies may look at changes over time in some key outcome variables, and/or differences between groups. One study compared road deaths in heavy transport and other forms of road transport in NSW and the rest of Australia was cited earlier (Peetz, 2022). That study focused on one important private and public effect of road transport regulation: road safety, as measured by road deaths. The time period for the study was over four decades (with 33 annual observations of the number of road deaths for each group — using data from 47,419 road crash fatalities). The 'treatment' group was heavy articulated vehicle transport in NSW, the control groups were other vehicles in NSW, and heavy articulated vehicle transport in other states. It showed significant safety improvements associated with the policy intervention.

423. A notable aspect of that study was the substantial annual variation in the number of road deaths among all groups. The average annual movement in the number of road deaths for articulated trucks in NSW was well below the trend decline related to the policy intervention, even though that policy intervention's apparent effect was statistically significant. This meant that it was only possible to evaluate the impact of the Chapter 6 model on road deaths after a long period of time. This has implications for the assessment of policy interventions in this space, in particular other interventions such as the Road Safety Remuneration Tribunal (RSRT). The RSRT only operated for a short time — too short for any proper evaluation of its impact ever to be made. This is most obviously the case in light of the substantial annual variation in the fatality rate

from road accidents involving heavy vehicles. Those evaluations that were undertaken were commissioned with a political focus (to facilitate the abolition of the scheme) and had serious weaknesses that rendered them of little value.

424. This tells us that assessments made of the impact of prior systems of regulation (i.e., other than the Closing Loopholes Act) would be very problematic if they relied on the RSRT. This is because it takes a long time for the resultant effects to be obvious in light of all the other influences on factors such as road safety. Comparisons between NSW and the rest of Australia are likely to be much more productive, both because the NSW system is still operating (so data can still be collected — some relevant data might never have been collected during the RSRT period) and, most importantly, it has been in operation for long enough for effects to become observable.

425. Another important point is that it is apparent that the full data to estimate the impact of RTR are not presently available. While, on some matters, informed estimates can be made (such as the numbers of employee drivers versus non-employee drivers), on other matters the data do not presently exist, or are too unreliable to use. This particularly relates to the incomes of employee and non-employee drivers, the proportions of non-employee drivers who would be in receipt of labour incomes that are below the minimum that some RTR might determine. We can estimate the value of production in road transport, but we have little information on the pass through of labour income rises into end prices. Evidence provided later in this report will show that there are productivity gains from higher remuneration of truck drivers, and there are reductions in costs that at least partially offset the higher financial costs to firms from greater labour incomes, but the evidence does not really quantify these effects in a systematic basis.

426. We know that there are health and safety gains from higher labour incomes, and these gains are shared between the firm, the driver and society at large. However, it would be brave to try to quantify those shares and the precise value of those gains to each party, for a variety of reasons starting with the fact that putting a financial value on human life is a fraught exercise. Still, some studies at least attempt to do the last of those things.

427. One effect that is apparent, though, is that any future rise in owner driver incomes in road transport are likely to have a very small impact on the price level. To the extent that higher remuneration does put any upward pressure on freight prices, the latter would seem to be inefficiently low to begin with. Furthermore, at least some of this would be offset by hiring efficiencies, a more motivated labour force, and reduced dwell time, as well as higher productivity. Moreover, even if the explicit cost of freight increases, a priori, it is not clear that this would be a net-loss. For example, to the extent that pay and health are related, better pay promises to reduce the burden of low road human resource management practices on the health care system and, perhaps more importantly, to the extent that pay and safety are related, better pay promises to reduce the collateral damage created by truck crashes.

9.5. The economics of pay, safety and health

428. Looking at the economic theory of pay, safety and health enables us to make use of material from outside the road transport sector, providing the context for material that is specifically about the road transport sector. While specific quantities vary among industries, economists generally think that what is theoretically understood and empirically verifiable in one industry is, to a first approximation, applicable to another. While empirical analysis varies by industry, economic theory does not.

429. Economic theory suggests that increased compensation is a driving force in productivity, increased safety, and the resulting health outcomes of road transport workers. The economic theory in this report frames an argument for the implementation of efficiency wages in the form of 'safe rates' and for a rethinking of piece-rate compensation (payment per kilometre or per trip). It shows that it is important for safety and economic efficiency to explicitly pay truck drivers for their non-driving service to the employer. In addition, it is in the interest of labour market equity and efficiency, to at least ensure that the piece-rates that are used for non-employee drivers have the same value as the labour income received by employee drivers. This means that, in effect, non-employee drivers would be paid for both their driving and non-driving time, since employee drivers are typically paid for both driving and non-driving time if it occurs within their shift, as minimum rates of pay in the Road Transport and Distribution Award 2010 are expressed in hourly terms and working time is over a continuous period.

430. Theoretical and empirical economic research on compensation and productivity shows that:

- narrowly defined incentives can have unintended consequences;
- higher wages increase productivity, while lower pay can reduce productivity;
- 'shirking' is reduced by higher wages and less wasting of workers time by such factors as commuting time;
- paying higher wages allows companies to acquire better candidates who will have longer tenure with the firm;
- workers have a sense of fairness about their and they are likely to leave if they perceive their own wages are low relative to comparable peers;
- when workers believe they are being compensated 'generously', or even 'fairly', this may induce extra effort to justify the perceived 'extra compensation' they are receiving, thereby affecting effort and productivity;
- an unregulated labour market, without wage floors, can lead to the 'race to the bottom', with high quality labour leaving a labour market for better offers elsewhere;
- low road employment practices (such as high use of temporary staff) are negatively correlated with corporate performance, innovation and job satisfaction;
- hourly labour productivity declines as working hours increase into higher ranges;
- morbidity increases as wages, job security and job quality fall;
- jobs with a higher level of physical labour and exertion lead to poor health outcomes;

- performance-based pay schemes can lead to overexertion, exhaustion and stress, and encourage behaviour that increases the probabilities of accidents, injuries, and fatalities;
- especially in cases where there are negative externalities and monopsony power, under-pricing of labour will lead to inefficiencies, below-par social welfare and workplace disamenities which lead to 'labour shortages'.

431. Three related studies specifically on road freight transport suggest that upstream economic incentives may shape downstream safety and performance outcomes in road transport. One indicated that drivers tended to work more hours until they hit their 'target earnings', but this 'turning point' is not reached until they work an undesirably high number of hours. This tendency is intensified by piece rates (worked by contractors and owner-drivers) and non-payment for non-driving time. A second study suggested that, on average, for every 10% greater driver compensation, there are approximately 9% fewer crashes, holding all other factors constant. A third found that higher driver pay and pay increases are associated with improved safety performance. It also found that greater driver tenure (commonly associated with higher pay) itself contributes to better safety performance.

432. Other studies specifically in road freight transport found, as predicted by the broader efficiency wage literature, that intense competition and the externalization of safety costs puts significant pressure on owner operators and subcontractors to underbid. This creates a 'race for the bottom' scenario that culminates in a proliferation of precarious work arrangements, which can lead to lower productivity in the long run. Owner drivers are more likely to be paid piece rates, driver longer distances, work longer hours, experience more occupational violence, and accept lower rates, all leading to higher safety costs. To the extent that they bear the costs of poor safety, freight owners making greater use of contractor owner drivers potentially could be exposing themselves to increased safety costs, but the biggest casualties are the drivers themselves and the other road users.

433. Studies using firm-level operational and financial data have also demonstrated that trucking companies on sound financial footing were significantly safer than firms operating on thin margins. Firms that are not making money cannot devote significant resources to driver pay, and hence find themselves at greater risk. That said, it is also the case that trade union representation—itself naturally associated with higher driver pay—also is associated with better safety performance.

434. The primary social benefit from rate floors is improved safety performance. Sustainable pay would attract better drivers, discourage longer work hours, and reduce economic pressure. Establishing a chain of responsibility would prevent freight owners and, to a lesser extent, logistics firms, from using contractual chain complexity to avoid their responsibility in road safety outcomes. Doing these things would reduce truckdrivers' allostatic load, the incidence of morbidities, and the burden on the healthcare system.

435. Externalities are not the only source of economic inefficiency. A shortfall in competition can create inefficiency as well. Markets are prone to overproduction at an inefficiently low price point in the presence of a supply-side negative externality. When there is monopsony power (where buyers are able to influence prices, rather than prices being externally set by a 'market' that cannot be influenced by individual firms), markets are prone to incorrect production at an inefficiently low price point. This is partly because some of the costs of production escape the transaction and, therefore, the internal cost of the activity is artificially 'cheap'. Drivers in monopsonistic markets receive incomes below what they would receive in a perfectly competitive market. The potential for monopsony among clients could help explain the simultaneous existence of low incomes, poor safety and driver shortages. Over-production due to under-pricing of labour in road transport can lead to higher crash risks for professional drivers, non-involved drivers and passengers, and other externalities such as pollution, excessive carbon emissions, congestion. Thus, in the presence of both negative externalities and monopsony power, rate floors could increase social net-benefit.

436. In sum, there is a body of international evidence, theoretical and empirical, showing that appropriate (higher) remuneration in the RT sector leads to improved safety outcomes. 'Safe rates' lead to better safety. This is confirmed by evidence from Australia, based on the comparison of NSW (under Chapter 6 of that state's Industrial Relations Act) with the rest of Australia. While confidence in such a relationship in Australia might have been weakened by the experience of the RSRT, that system was in place for too short a time for proper evaluation to ever occur, and it has been incorrectly asserted that it showed the absence of any 'safe rates' relationship.

437. There is also a body of theoretical and empirical evidence of a relationship between higher pay and improved private outcomes for the firm, through impacts on hiring costs, shirking, and productivity. The evidence is strongly suggestive that a more efficient allocation of resources, and reduced incentives for risky behaviour, would occur if drivers were paid adequately for all their time (including non-driving time), though we do not have direct Australian evidence that quantifies the relationship between pay and such outcomes.

9.6. Further research possibilities

438. Broadly speaking, the data enabling a quantitative estimation of the price impact of RTR do not really exist. We can be confident that the impact on aggregate price levels across the economy, and hence on inflation, would be very small. Beyond that, however, it is difficult to quantify exactly what the impact on transport prices would be. We can estimate moderately confidently the number of employee and non-employee truck drivers in Australia. However, we cannot estimate the labour income gap between employee and non-employee drivers and, if a floor on non-employee earnings were to be recommended that was functionally equivalent to the relevant award rate, we have no way of estimating the proportion of non-employee drivers who would fall below that threshold, and by how much they would fall below it. We can estimate the value of production in the road transport industry in Australia. We have little basis for estimating the pass-through to prices of cost increases arising from RTR affecting labour income

for non-employees. Publicly available data at the state level (to enable NSW to be compared with the rest of Australia) are limited by small sample cell sizes, and often not even available. Data to enable retrospective comparisons to be made of the effects of the RSRT are either unlikely to be held, or unlikely to be very useful, given the short life of that tribunal.

439. The most productive approach to filling the gaps in our knowledge, we believe, would be to undertake intra-firm and inter-firm studies showing the actual impact of RTR in an Australian context, in NSW vs the rest of Australia. That would address the effects of the data deficiencies by constructing a picture of the total effect of RTR in an Australian context. It could consider such matters as the use of employees vs contractors/owner drivers, terms and conditions, delivery time, driver reliability, safety indicators, driver turnover, pay, job security, tenure, intention to leave, costs and productivity.

440. Further longitudinal research could subsequently investigate the internal effects of minimum sustainable rates, through technical efficiency analysis, cost efficiency analysis or net present value analysis. Other research could study the external effects of minimum sustainable rates, with a focus on analysis of crash cost savings, alongside analysis of health effects, dead weight losses and social benefit.

9.7. Recommendations

441. In light of the findings of this report, we recommend the following:

I The procedures outlined under Part 16 of the *Closing Loopholes No. 2 Act* be activated to enable the establishment of:

- minimum rates of payment for trips by owner-drivers and contractor drivers of trucks be established so that the net incomes to drivers after costs are accounted for become equivalent for all types of drivers, regardless of whether they are employees, owner-drivers or contractors;

- minimum rates of payment for trips by owner-drivers and contractor drivers of trucks be sufficient to minimise the incentives for risky behaviour that endangers drivers and other road users; and

- other mechanisms — to ensure worker input, support collective bargaining by contractors and owner-drivers, manage grievance resolution, and underpin effective enforcement and compliance — that maximise the effectiveness of the reforms and prevent the re-emergence of 'loopholes'.

II Organisations representing contractor firms and individuals, employees, employees, owner-drivers, beneficial freight owners, government and other industry participants continue the process embodied in the industry roundtable in Parliament

House in August 2022, and other agreements between industry parties, and support the above actions due to the beneficial impacts on:

- road safety;
- economic efficiency;
- efficient resource allocation; and
- health of drivers.

III Further research be undertaken into the areas identified in this report where knowledge is presently inadequate, including through:

- a comparative study assessing the impact of a known policy intervention (Chapter 6 regulation in NSW);
- collection of cross-sectional and longitudinal data that document and link hours of work, remuneration method and level, trucking firm safety performance, trucking firm economic performance, and driver safety and health.

10. Appendixes

Appendix 10.1: Simple algebra for a basic model

442. In this appendix, algebraic equations are developed to describe a theoretical model underpinning the estimation of the price effects of road transport regulation (RTR). As was shown in chapter 5, however, the data do not presently exist to enable that model to be properly estimated and resolved. Hence the model has not been fully developed and its presentation here does not imply that we consider further development or enumeration of it would represent a wise use of resources.

- The net costs/benefits of RTR consist of the financial or private costs plus the social benefits or costs.

$N_A = C_P + B_P + C_S + B_S$

where
N_A = net costs and benefits
C_P = private costs
B_P = private benefits
C_S = social costs
Bs = social benefits

- Private financial costs = private financial costs to firms (sellers) + private financial costs to workers

$C_{nP} = C_{nPf} + C_{nPs}$
where
C_{nPf} = net private financial costs to firms
C_{nPs} = net private financial costs to workers

So
$C_{nA} = C_{nPf} + C_{nPs} + C_{nS}$

- Private financial costs to firms = [% increase in prices minus % increase in productivity] times prior $ value of affected production

$C_{Pf} = (\Delta P - \Delta V)\ Q_a$
where
ΔP = % increase in prices
ΔV = % increase in productivity
Q_a = prior $ value of affected production

So

$C_{nA} = (\Delta P - \Delta V) Q_a + C_{nPs} + C_{nS}$

- % Increase in prices = % increase in costs x % pass-through of cost increase into prices

$\Delta P = f \Delta C$
where
f = % pass-through of cost increases into prices
ΔC = % increase in costs

So
$C_{nA} = (f \Delta C - \Delta V) Q_a + C_{nPs} + C_{nS}$

- % Increase in costs = % wage uplift x % labour share of costs

$\Delta C = \Delta w L/C$
where
Δw = % wage uplift
L/C = labour share of costs

So
$C_{nA} = (f \Delta w L/C - \Delta V) Q_a + C_{nPs} + C_{nS}$

- % Labour income uplift = ([award rate minus actual rates]/ actual labour income rate (H))

$\Delta w = (w_a - w_g) / w_g$
where
w_a = award rate
w_g = going (actual) rate for non-employee labour

so
$C_{nA} = (f (w_a - w_g) / w_g) L/C - \Delta V) Q_a + C_{nPs} + C_{nS}$

- % increase in productivity = % productivity elasticity wrt wages x % wage uplift

$\Delta V = \Delta w e(V) = \Delta W (dV/V) / (dW/W)$

Appendix 10.2: Monitoring Dwell Time and the Chain of Responsibility

443. We think the monitoring of dwell time is an important part of the research agenda. However, if our charge is specifically to explore the internal and external return on safe rates regulations, then we would call this ancillary. Even so, we think it is still worth mentioning.

444. If the Australian experience is anything like the US and global experience, dwell time is causing a lot of money to be left on the table for drivers and trucking companies and, more importantly, a lot of crashes (Office of the Inspector General, 2018). This excessive dwell time also reduces Gross Domestic Product, as it is a deadweight loss. It is unclear, however, that anyone has tried to study this longitudinally in AU. However, there is some reason to believe that consignors and consignees are not fully internalizing their role in the 'chain of responsibility' and that this has deleterious safety effects (Friswell & Williamson, 2019; Williamson & Friswell, 2013). Thus, for enforcement purposes, monitoring dwell time and studying its determinants seems like an important thing to do. Furthermore, if data on dwell time are made available, it would give carriers a mechanism by which they could more accurately price contracts, plan routes, and pick loads.[11]

445. Methodologically speaking, the primary bottleneck is acquiring the data. We see two options:

- Electronic log device (ELD) data is geocoded and, therefore, could be collected and mined for very accurate dwell time information.
- Like FMCSA is doing, BITRE, or some other entity, could set up a website where drivers can submit their wait time information, review of facilities, and so on.

446. The first option promises to be more accurate, but much heavier handed (i.e., ELD data acquisition). The other is easier and, presumably, cheaper, but more exposed to sampling and validity concerns.

447. Either way, once the data are in hand, figuring out the association between dwell time and safety outcomes is a relatively straight forward exercise in regression modelling and predictive analytics. Tracking the effect of policy interventions on dwell time could also be done following a very similar framework to what was discussed above. Again, the hard part here is going to be establishing a data stream.

[11] Ideally, this would be posted on a dashboard online with historical data available for download.

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