



# **Working from home**

## Research paper

**The Productivity Commission acknowledges the Traditional Owners of Country throughout Australia and their continuing connection to land, waters and community. We pay our respects to their Cultures, Country and Elders past and present.**

## **The Productivity Commission**

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## Foreword

Working from home is not new. Before the Industrial Revolution, most people worked from home — in agriculture or as skilled artisans or running a household. The rise of the factory system, and later the office, led the historic shift to the central workplace. It was reinforced by large falls in the cost of transporting people from home to work and back again, by bicycle, train, tram, car and bus.

This shaped our cities, community and family life.

More recently, technology has gone in a different direction. The cost of commuting has stopped falling, but the cost of communicating (at a distance) has fallen dramatically.

Yet predictions of widespread remote work had failed to materialise — until the COVID-19 pandemic. It is clear that many firms and workers, when forced to experiment with working from home, changed their minds — becoming more positive about the feasibility and benefits of remote work.

In this report, we have tried to take a broader view of the economic process by which working from home has come to the fore and will continue to evolve. The report explores the role of the forced experiment due to the pandemic. It highlights the importance of ongoing experimentation and variety, with different firms trying out different models, some of which will work and some of which will not. It emphasises continued learning, as firms and workers get better at managing remote work and finding the right balance.

The precise path of this evolution cannot be mapped out ahead of time. We offer judgments, not predictions. It might change not just where we work, but how we work. It might change work patterns across time as well as across space. But two tentative conclusions emerge: first, this is broadly a beneficial evolution in the way we work; and second, even in the face of a significant and sudden change, our firms, our cities and our regulatory frameworks have significant capacity to adapt.

We wish to thank the staff team, headed up by Matthew Forbes and Mary Cavar, and consisting of Mabel Andalon, Yvette Goss, John Hondros, Matt Jones, Cordelia Foo, Claire Prideaux and the late Peter Garrick. We would like to acknowledge Peter's service to the Commission over many years and many projects. We miss his dry wit, endless well of stories and extensive knowledge of many topics.

Michael Brennan  
Chair

Romlie Mokak  
Commissioner



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# Executive summary

## A forced experiment

The COVID-19 pandemic forced many workers and firms — up to 40% of workers — to experiment with working from home. While the stay-at-home orders that forced this experiment are gradually easing across the developed world, the level of working from home is likely to remain much higher than it was before the pandemic.

This forced experiment showed that many people could do their jobs at home just as well as in the office. Workers really valued the time and money saved through not commuting, as well as the extra flexibility in their lives. And some firms can see potential productivity improvements and/or cost savings in a world of more work from home.

This is a change to the way many people work, and is unprecedented in terms of size and speed. This poses several questions: What does the increase in working from home mean for people, firms, and urban centres? How will working from home continue to evolve? Will our regulatory frameworks be able to deal with issues that arise? While the process of change will be challenging for some, it is a fundamentally positive development overall, unlocking newfound value to be shared between workers and firms. Governments should not fight it.

## Who can work from home?

The ability for people to do their job from home is strongly tied to their occupation and the tasks they are required to perform. Working from home is particularly suited to office-based workers such as managers, professionals and clerical and administrative workers, where workers use computers, interact less with the public, do not perform outdoor work or physical activity, and do not work with immovable structures, materials or equipment.

Census data from 2016 shows that approximately 35% of workers had jobs that were amenable to working from home. This potential to work from home is associated with higher levels of education and higher incomes, and full-time jobs.

## Why didn't these people work from home before the pandemic?

Prior to the pandemic, the technology allowing many people to work from home existed — but very few took it up. HILDA data show that, in 2019, around 8% of employees had a formal work-from-home arrangement, and worked a median of one day per week from home. Overall, around 2% of total hours were worked from home. Census data from 2016 also suggests that a small proportion of workers (5%) worked from home instead of commuting on census day.

A number of reasons can be advanced for low take-up of work-from-home arrangements prior to the pandemic. Management practices and cultural norms in workplaces, and stigma associated with working from home, may have discouraged remote work. Firms would have been reluctant to invest in the technology and systems for large-scale working from home, given uncertainty about its benefits. As the CEO of Morgan Stanley explained in 2020:

If you'd said three months ago that 90% of our employees will be working from home and the employer would be functioning fine, I'd say that is a test I'm not prepared to take because the downside of being wrong on that is massive. (Cutter 2020)



## A second experiment

While work from home during 2020 and 2021 was not typical of working from home prior to the pandemic, it was better than expected for many, and attitudes and norms have changed. Workers and firms are now embarking on a second wave of experimentation — negotiating, trialling and adjusting — to see what best works for them.

While it is not possible (nor meaningful) to predict the outcomes of this experiment, understanding the economic forces that underpin this process can reveal some possible outcomes and help policy makers understand the change and be prepared for it.

### What do workers want?

Most workers want to work from home, at least some of the time. About three-quarters of workers surveyed considered that they were at least as productive working from home as from the office. Views from employers are broadly similar, if slightly less positive.

The primary benefit for workers is the avoided commute. In 2019, full-time workers in Australian major cities spent an average of around 67 minutes per day commuting, which in terms of forgone earnings amounted to \$49, not including vehicle costs. For those taking public transport, the average time value and transport cost totalled \$57 per day.

But few workers prefer fully remote work, and most want to spend some time working from the office. There are actual or perceived costs to working from home, such as reduced opportunities for collaboration and networking, reduced face-to-face interaction with managers, and consequences for long-term career prospects.

Nonetheless, many employees highly value the ability to work from home, and are willing to change jobs or accept lower wages in order to continue working from home.

### What do firms want?

Firm preferences are largely driven by the actual or perceived productivity and costs of working from home.

- Working from home may increase co-ordination costs, reduce serendipitous interactions and knowledge-sharing, stymie creativity and decrease the effectiveness of collaborative processes. Separation from managers may also afford workers the opportunity to slack off.
- On the other hand, workers may be more productive at home because they have better control over their time and enjoy better work–life balance. Firms will be able to tap into a larger pool of (more productive) labour. And while not strictly a productivity impact, workers have been shown to work longer hours when working from home during the pandemic.
- Some firms may also be able to realise office rent savings. That said, firms may be locked into long-term leases and may be reluctant to relinquish office space while they are still experimenting with working from home.

But not every firm is a fan of working from home. For example, according to the CEO of JP Morgan Chase, it ‘doesn’t work for people who want to hustle, doesn’t work for culture, doesn’t work for idea generation’.

Evidence is mixed on how working from home affects productivity for individuals in practice. But, over time, as firms and workers negotiate outcomes, learn and adapt, and become more effective at working from home, there are grounds for optimism at the economy-wide level. In all likelihood, productivity will remain the same or improve under more widespread working from home.

## How will these differences be reconciled in the short term?

Working from home unlocks a large potential benefit that accrues to workers in the first instance, due to the avoided commute. As such, workers generally prefer more work from home than firms (but more firms than workers prefer the fully remote model). But it is firms that determine work from home policies, at least in the short term.

In reality, we expect workers and firms to negotiate mutually agreeable outcomes. Many firms are likely to experiment with the hybrid model, where workers spend two to three days a week in the office and two to three days working from home. If all workers who could work from home did so two days per week, around 13% of all hours would be worked remotely.

The hybrid model is intuitively appealing, balancing the benefits of working in the office — being able to collaborate, innovate and interact with colleagues face-to-face — with the flexibility, quiet and lack of commuting associated with working from home. In practice, the hybrid model may be more difficult to execute well, due to increased management and coordination costs.

‘Work from anywhere’ is a variation of the hybrid model, where workers have more control over where they work each day, but with an expectation of some office time.

A small number of firms are adopting fully remote models. This has been observed among high-tech firms (where use of collaborative technologies is commonplace and access to a global talent pool is important), as well as low-skill jobs, such as call centres (where monitoring is easier and collaboration is less important).

## And in the long term?

Over time, workers are able to change jobs and choose those that better suit their preferences. Anecdotal evidence suggest that many people are already leaving their jobs to pursue the flexibility offered by remote work.

Workers may also be willing to accept lower wages to work from home. Survey data from the US suggests that the ability to work from home two or three days per week may be worth a 7% pay rise to workers, and about 40% of workers who currently work from home would seek another job if their current employer required a full return to the office. In reality, we consider that wage reductions are unlikely at the aggregate level.

Job switching and negotiation on wages provides firms with information about what attracts (desirable) workers. In this way, switching and negotiation set in motion a process of experimentation in which firms try different arrangements, observe outcomes, relinquish unsuitable arrangements and maintain those that yield desirable results.

The simultaneous nature of the current wave of experimentation across firms also allows collective learning through observing others and imitating successful innovations. Over time, the diffusion of successful innovations is likely to reduce the overall costs of working from home and limit any risk of lower productivity. The wellbeing benefit of working from home provides a clear and strong incentive to make it work.

## How will working from home affect our wellbeing?

Working from home can affect various aspects of wellbeing, including physical and mental health, work–life balance, and family functioning. It may also open up work opportunities for people who face barriers to labour force participation or full-time employment, such as people with disabilities or caring responsibilities.

Working from home can improve physical and mental health by giving people more time and control over their day — to sleep, exercise and cook nutritious food, for example. But it can also worsen physical and mental health due to decreased incidental exercise, increased isolation, and the elimination of the boundaries between home and work life.

- Evidence shows that working from home reduces physical activity levels. For example, the average UK public transport commuter misses out on 21 minutes of incidental exercise for each day that they work from home.
- But evidence also shows that those working from home are not more likely to experience loneliness or mental ill-health.
- For some, working from home improves their work–life balance, whereas others can find it difficult to switch off and maintain work–life balance when working from home.

## Working from home can improve employment opportunities

Avoiding the commute reduces the ‘cost’ of working, and this is expected to induce an increase in labour supply. This may include more work opportunities for people who face barriers to labour force participation. This includes carers, parents of young children, some people with disabilities, as well as people living in remote or regional areas where there are often fewer job opportunities in close physical proximity. Working from home policies can also promote a more gender-balanced workforce.

## Should governments care about the increase in working from home?

Working from home represents a potential overall gain to society, and there is a strong case to allow workers and firms to negotiate mutually beneficial outcomes. This negotiation will happen largely at the individual (contracts) or firm level (workplace policies), and outside the formal workplace relations system.

But it is appropriate for governments to monitor labour market and regulatory settings to ensure they remain fit for purpose: that they are fair as well as flexible and efficient and that they continue to promote the safety and protection of workers.

## Workplace health and safety

Australia’s work health and safety (WHS) system is set up well to handle more widespread working from home. Australia’s WHS laws are relatively broad and principle-based. WHS is the joint responsibility of employers and workers, and this responsibility applies wherever work is carried out, including in the home.

But working from home creates more *complexity* for managing WHS risks, in that the employer has less visibility and control of the working environment. This may raise the perceived costs of working from home to the employer. Much will depend on the evolution of case law on what is ‘reasonably practical’ when working from home.

Working from home can have unique impacts on psychological health. Without the cues of a commute, some workers may struggle to switch off from work. And some employers may expect their workers to be more available when working from home. Working from home has the potential to affect stress levels, relationships at home and lead to burnout, although evidence of this occurring is limited.

This has led some in the union movement to call for a 'right to disconnect'. The ACTU has said that there needs to be legal and reasonable limits on working time — including a 'right to disconnect' from work emails, telephone calls and other forms of contact outside of scheduled work hours.

## **The impact on central business districts (CBDs)**

Working from home is largely a CBD-centric shock. The 'knowledge' jobs amenable to working from home are currently concentrated in the CBDs of our biggest cities. And the people who work in those jobs tend to live in the inner and middle suburbs.

As more people work from home and avoid commuting into the CBD, some economic activity (such as demand for retail, hospitality and personal services) is expected to shift from the CBDs to the suburbs. And demand for office space could decline, as some firms look to downsize or relinquish their offices. This has prompted some to call for workers to go back to the office, to 'save the CBDs'.

While the shift of economic activity from CBDs to suburbs is clearly disruptive to some CBD businesses, new business opportunities are opening up in the suburbs and regional areas. Moreover, the death of the CBD has been greatly exaggerated. There are a number of compelling reasons why CBDs will remain attractive hubs of economic activity.

- Many firms will experiment with hybrid or work-from-anywhere models, and will maintain their CBD offices because of their central location and accessibility. The hybrid model will also maintain workers' link to cities.
- The benefits of close proximity — sharing, matching and learning — remain strongest in high density areas such as CBDs, even with the advent of digital technologies.
- The second-round effects of declining office rents will limit the exodus of firms from the CBD and could attract new entrants.

## **Will working from home solve our congestion problems?**

Congestion is a substantial cost — in terms of time, money and pollution — in our populous cities. Unfortunately, increased working from home is unlikely to be the panacea to our congestion problems, at least in the short term.

Due to COVID-19, there has been a substantial shift away from public transport towards road travel. And abstracting from the pandemic, there is evidence that people who work from home tend to make more frequent non-work car trips. Hybrid workers are also more likely to drive than take public transport on the days they go into the office.

## **Policy should support the transition to working from home**

The shift to working from home caused by the pandemic is a large and material change in the way many people work. Even if half of the people who could work remotely do so an average of two days per week, overall hours worked from home would increase from a pre-pandemic level of just under 2% of all work hours to just under 7%. This is a large change that has happened very quickly, but should be kept in perspective. The central workplace will remain the dominant model for the foreseeable future. But the increase in working from home is potentially of great benefit to a substantial portion of the Australian workforce.

The forced experiment in working from home has resulted in considerable learning, demonstrating its feasibility and associated challenges. Now firms and workers will apply what they have learned in a second

wave of experimentation. The learning process will continue, at the level of the individual, the firm and the economy as a whole.

As with past technologically-enabled changes in work practices, the outcome of this evolution is likely to be positive overall. Individuals and firms will adjust their preferences in light of experience; we will learn more about the relative value of in-person interaction and how to make best use of it; workers will seek out jobs that better suit their desired mix of remote and office-based work; workers and firms will tend to get better at identifying and segmenting the tasks that can be done remotely; offices will adapt and technology will almost certainly continue to improve.

While it will take some time before the implications of this process of change are realised, on balance, the outcome is expected to be positive. Governments should monitor the shift for any negative outcomes that require action, but overall should aim to smooth, rather than impede, the transition to different models of work.



# 1. Experimenting with working from home

## Key points

- \* **The COVID-19 pandemic forced many workers and firms to experiment with working from home, showing that many jobs can be done well remotely. Although long-term outcomes are unclear, the amount of work done from home is likely to remain much higher than it was before the pandemic.**
- \* **The increase in working from home is expected to be an enduring change. Before the pandemic, about 8% of people regularly worked some time from home, making up about 2% of total hours worked. But even as stay-at-home orders eased in early 2021, the number of people working from home remained at just under 40%.**
- \* **The increase in working from home is a major change in the labour market that has occurred at unprecedented speed.**
- \* **The ability for people to do their job from home is strongly tied to the tasks they perform. In 2016, approximately 35% of workers had jobs that were amenable to working from home, including office-based and 'knowledge' workers.**
  - The potential to work from home is associated with higher levels of education and higher incomes, although there are many lower-paid jobs that require less education that can be also be done from home.
- \* **Workers and firms are now embarking on a second wave of experimenting with working from home, resulting in a number of different work-from-home models being tried.**

The COVID-19 pandemic has caused a large and rapid increase in the number of people working from home (box 1.1). While requirements that people work from home where possible were introduced expediently, it seems unlikely that the share of people working from home will return to pre-pandemic levels.

This is a change to the way much work is done that has happened very quickly. In the past few decades there have been large structural changes to the labour market, like the rise of female workforce participation, the decline in manufacturing jobs and the increased involvement of older workers in the labour market (figure 1.1). But these changes — though large — took place over long timeframes.

### **Box 1.1 – What is ‘working from home’?**

There are a range of terms associated with the idea of working from home, including remote working, teleworking and telecommuting. The Commission has adapted Allen et al. (2015) and the International Labor Organization’s (2020) definitions to define working from home as when someone works either part, or all, of their *regular work time* in their primary place of residence. In doing so they reduce their time spent commuting and are potentially able to access more flexible working hours.

People working from home typically rely on telecommunications technology to engage with co-workers who may either be working remotely or in a centralised workplace. For this paper, an individual who works from home is not someone who works their standard hours in a centralised workplace and then works additional overtime hours at home, or someone who conducts unpaid work in the home, including house work, caring responsibilities, and volunteer work.

This is a change to the way much work is done that has happened very quickly. In the last few decades there have been large structural changes to the labour market, like the rise of female workforce participation, the decline in manufacturing jobs and the increased involvement of older workers in the labour market (figure 1.1). But these changes — though large — took place over long timeframes.

By contrast, the shift to remote work was a sudden change to the way many people work, resulting in a dramatic increase in the number of people working from home in a matter of weeks. In historic terms, the rise in working from home represents a rapid discontinuation with previous practices, even allowing for the likelihood that the amount of work done from home will eventually settle somewhere between its pandemic and pre-pandemic levels. This naturally leads to several questions: how will working from home continue to change? What will the impact be on people, firms, and cities? Will our regulatory frameworks be able to deal with issues that arise? This paper considers these issues.

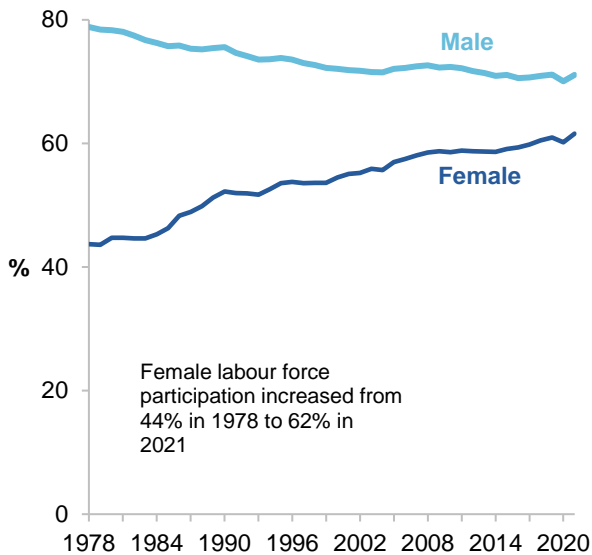
This chapter provides the context for the analysis in subsequent chapters. Prior to the pandemic, the technology allowing many workers to work from home existed — but very few employees did work from home. The pandemic sparked an experiment in which workers were forced to work from home, and many discovered the benefits of doing so.

The desire of many people to continue doing at least some work from home has prompted a second wave of experimentation where firms are free to try a range of approaches to working from home in order to see what best works for them. This is an ongoing process of negotiation, trial and error, and adjustment, that will continue for some time.

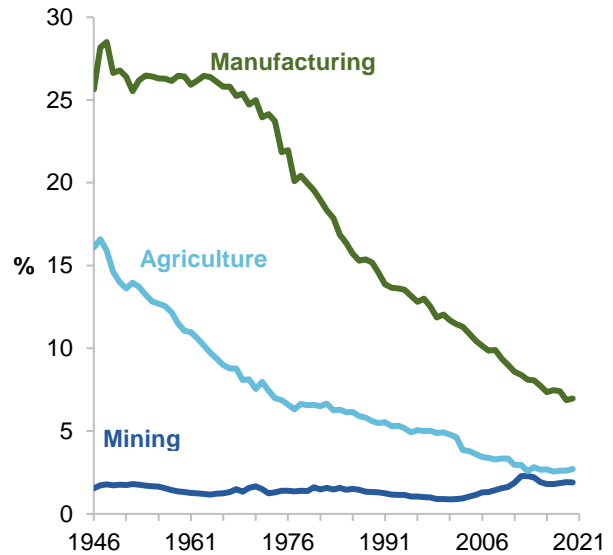


**Figure 1.1 – The increase in working from home has occurred much more quickly than other labour market changes**

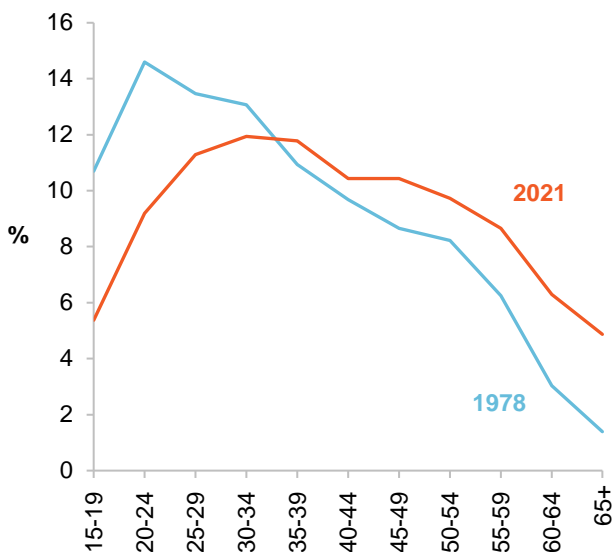
a. Increasing female labour force participation



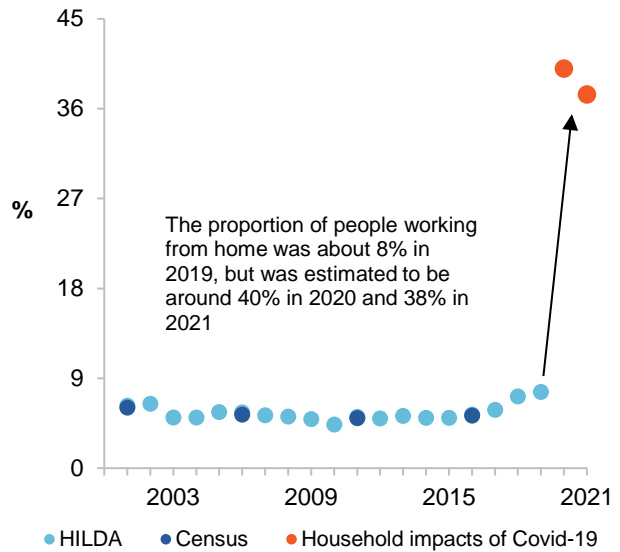
b. Declining manufacturing share of total employment



c. The ageing of the workforce



d. Increasing work from home<sup>a</sup>



a. Data from HILDA surveys show the percentage of people who have a formal agreement to work from home. Australian Bureau of Statistics (ABS) Census data shows the percentage of people who responded that they worked from home — rather than commuting to work — on the day of the census. *Household impacts of COVID-19* survey data shows the percentage of respondents who worked from home one or more times a week in the four weeks prior to the survey. Household impacts of COVID-19 data are from the September 2020 and June 2021 surveys.

Source: ABS (*Microdata: Census of Population and Housing*, 2001, 2006, 2011, 2016, Cat. no. 2037.0.30.001; *Household impacts of COVID-19 survey*, 2021, Cat. no. 4940.0; *Labour Force, Australia, Detailed*, Cat. no. 6291.0.55.001; *Labour Force, Australia, Detailed, Quarterly*, Cat. no. 6291.0.55.003); *Household, Income and Labour Dynamics of Australia*, waves 1–19; Withers, Endres and Perry (1985).

## 1.1 The untapped potential to work from home

The ability for people to do their job from home is strongly tied to their occupation, and ultimately to the tasks that they are required to perform. Working from home — where someone works either part, or all, of their *regular work time* in their primary place of residence — is particularly suited to office-based workers such as managers, professionals and clerical and administrative workers, where workers typically use computers, interact less with the public, do not perform outdoor work or physical activity, and do not work with large structures, materials or equipment.

The tasks involved in an occupation can be used to classify whether or not a job can be done from home (box 1.2). Using 2016 Census data, the Commission estimates that approximately 75% of clerical and administrative workers, 53% of professionals, and 52% of managers could have worked from home prior to the pandemic. Overall, approximately 35% of workers had jobs that were amenable to working from home, with the potential to do so higher among full-time and female workers (figure 1.2).

### Box 1.2 – Estimating the potential for jobs to be done from home

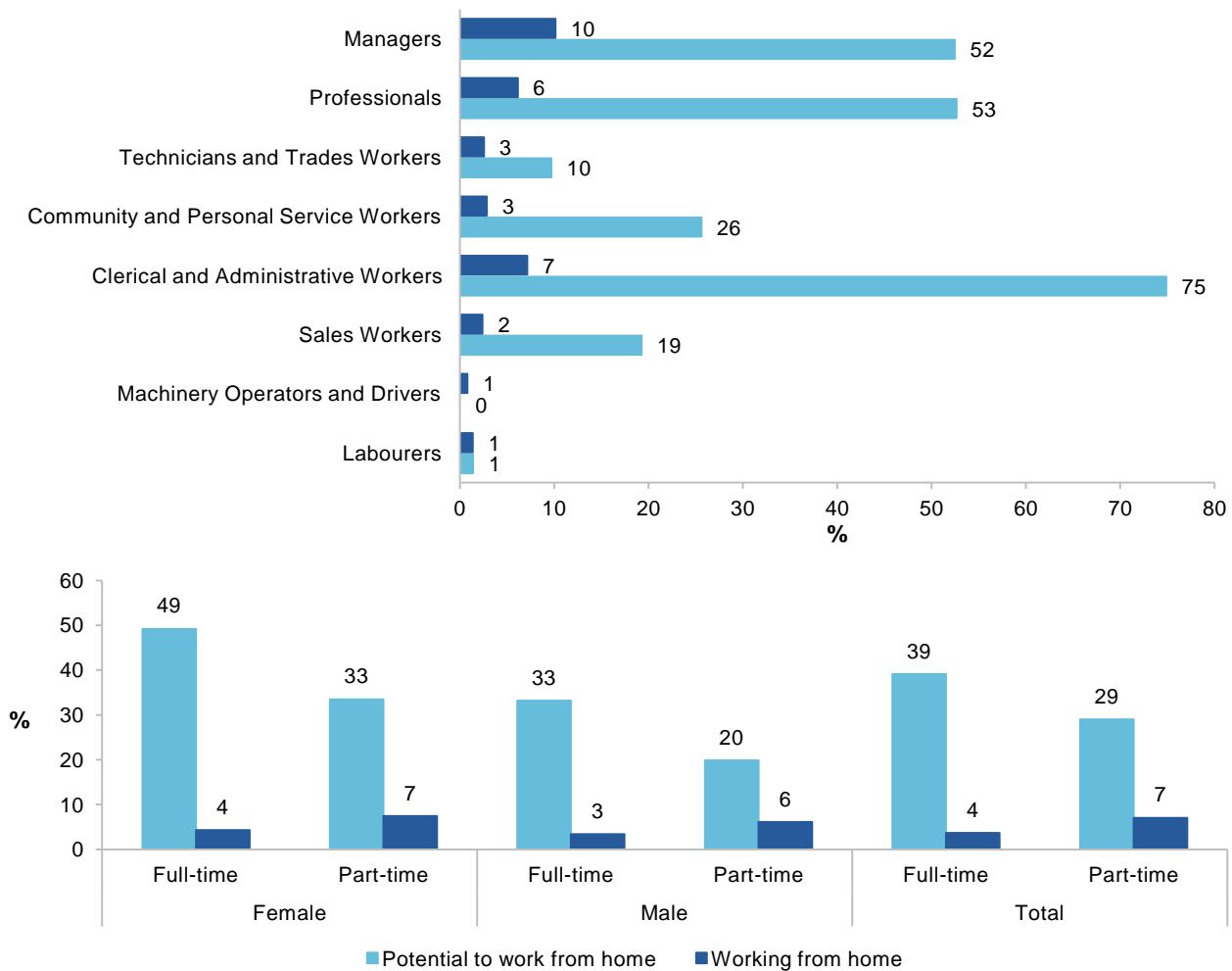
The different tasks associated with jobs can be used to assess whether or not a job can feasibly be done from home. Dingel and Nieman (2020) used detailed time use data from the United States that described the various tasks involved in around 1000 occupations to identify which jobs could be done remotely. For example, jobs involving outdoor work, physical activities, handling and moving objects or inspecting equipment, structures or materials were classed as not being able to be done from home. Occupations that typically use computers and require less interaction with the public were classed as being able to be done from home. These occupations included office and administrative workers, architects and engineers, management, business and finance and information technology roles.

To apply the Dingel and Nieman approach to Australian data, the US Standard Occupational Classification (SOC) codes were matched to the Australian and New Zealand Standard Classification of Occupations (ANZSCO). This assumes that the tasks associated with occupations in the United States are similar to those included in jobs in Australia.

There are two limitations to this approach. First, the Dingel and Nieman classifier is a binary classification, categorising occupations as being able/not able to be done from home, when it is likely that portions of some jobs can be done from home. Where jobs are classed as not being able to be done from home when *some* of their tasks may be able to be performed remotely, the classification is likely to understate the potential for jobs to be done remotely. Second, their approach is based on an algorithm that classifies an occupation solely on the basis of the tasks involved. The authors noted that there were cases where their algorithm classed occupations as being able to be done remotely that did not accord with their own judgement, including pre school and primary teachers. In the Commission's analysis, these occupations are regarded as not being able to be done from home.

**Figure 1.2 – Office-based, full-time and female workers have greater potential to work from home**

**Percentage of workers who worked from home, and who had the potential to work from home, by occupation, sex and workforce status, 2016<sup>a</sup>**



a. People are identified as working from home if they worked from home on the day of the Census.

Source: Productivity Commission estimates using ABS data (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

This is a necessarily blunt approach to assessing the potential for work to be done remotely. Jobs are composed of tasks, and some tasks — such as those requiring collaborative and creative work — are better done face-to-face, whereas others can be done well remotely. Classing jobs and occupations in a binary way — whether or not they can be done from home — ignores this nuance, and is an approximation of the potential across the labour market for work to be done remotely. In part, looking at jobs as being composed of a range of tasks that workers are required to complete explains the broad appeal of hybrid models that combine working in an office with working at home.

## Working from home is strongly associated with higher incomes and educational attainment

Prior to the pandemic, it was mainly ‘knowledge workers’<sup>1</sup> earning higher incomes who had more potential to do their job from home and were more likely to already be doing so. This is shown by the association between occupational scores and whether or not a person can or does work from home (figure 1.3). Occupational scores are a score between 0 and 100 that reflects the average educational requirements and earnings potential of different occupations (McMillan, Beavis and Jones 2009). Occupations associated with many years of education and high earnings potential are assigned a higher score, while occupations requiring fewer years of education and have low earnings potential have lower scores.

For men, the potential to work from home is concentrated among jobs with higher occupational scores. In contrast, a number of women work in jobs — such as administrative and clerical positions — that have lower educational requirements and earnings potential, that can be done from home. Many of these people were not working from home prior to the pandemic, but are likely to benefit from a sustained increase in access to work from home.

Despite the potential for many people to work from home, the proportion of people working from home has remained consistently low over the last two decades (figure 1.1). Approximately 8% of employees in the 2019 Household, Income and Labour Dynamics in Australia (HILDA) survey reported having a formal work-from-home arrangement with their employers (working a median of one day per week from home). Census data from 2016 also suggests that a similar proportion of workers (5.3%) worked from home instead of commuting on census day.

A number of reasons can be advanced for the low take-up of work-from-home arrangements prior to the pandemic. Management practices and cultural norms in workplaces may have discouraged remote work (PC 2014). Stigma associated with working from home — that ‘working from home’ was ‘shirking from home’ — also limited employee interest (Barrero, Bloom and Davis 2021b). Gender bias likely played a role, with women — particularly mothers — more likely to experience discrimination associated with home-based work (Chung 2020).

Moreover, uncertainty among firms and workers as to whether large-scale working from home was feasible and economically beneficial also meant that employers were reluctant to take risks and make upfront investments to enable remote working (in new technology and training, for example) (Holmstrom and Tirole 1989). In some fields, such as banking and finance, the risks associated with remote work may be substantial, including information and technology security risks, and the potential for fraud and staff misconduct. As James Gorman, CEO of Morgan Stanley explained in 2020:

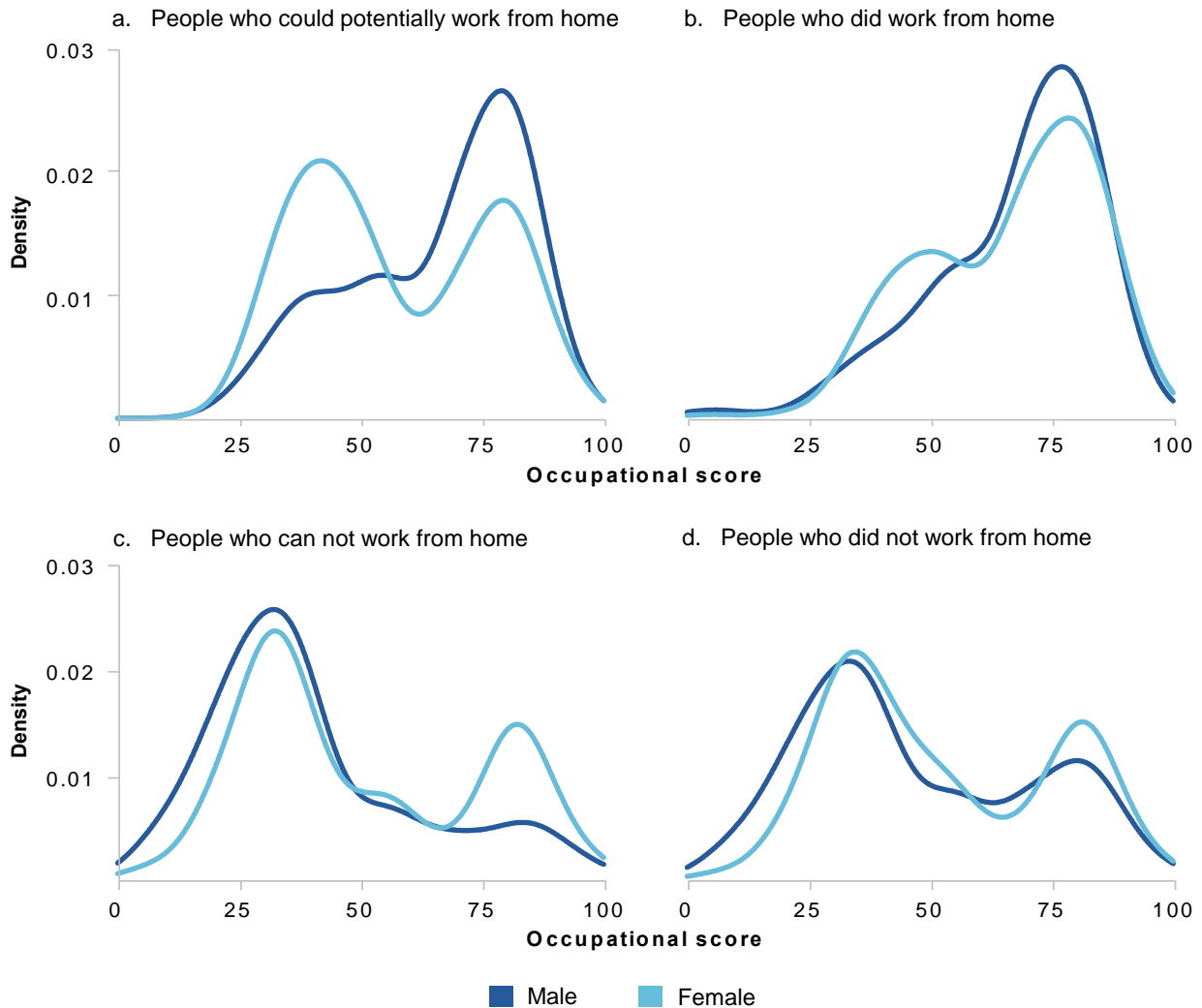
If you’d said three months ago that 90% of our employees will be working from home and the employer would be functioning fine, I’d say that is a test I’m not prepared to take because the downside of being wrong on that is massive. (Cutter 2020)

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<sup>1</sup> There are numerous descriptions of what constitutes a knowledge worker, and ‘consequently the term is fuzzy, variously interpreted and used with vague definitions or without defining’ (Surawski 2019, p. 105). Knowledge workers can be thought of as possessing a high level of professional knowledge, education or experience. Their jobs primarily involve the creation, transfer and practical application of this knowledge (Davenport 2005).

**Figure 1.3 – People who can work from home typically have jobs with higher education requirements and higher expected incomes**

**Distribution of occupational scores by work from home status<sup>a</sup>**



a. Occupational scores are assigned to occupations at the two-digit ANZSCO level using the Australian Socioeconomic Index 2006, and are included in HILDA survey data. Higher scores reflect the higher average education requirements and earnings potential for people employed in a given occupation. The index represents the educational requirements and potential income of an occupation in 2006, so changes in educational requirements or the potential income of occupations over the sample period are not represented in the occupational score.

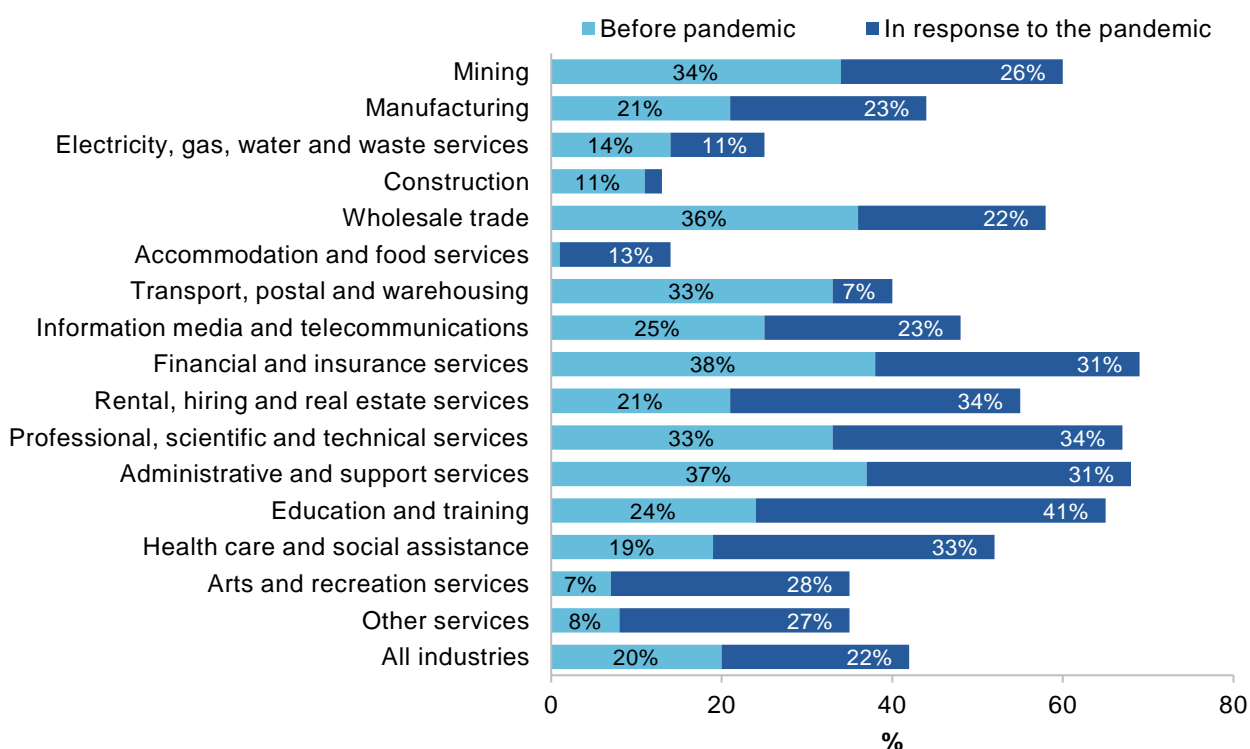
Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

## 1.2 The pandemic forced firms to experiment with working from home

In 2020, the COVID-19 pandemic required many people to work from home, *regardless of the economic costs*. Working from home changed quickly from an opportunity that was taken up by relatively few workers (often women and people working part time — box 1.3) to an essential way of getting work done. Where they were previously reluctant, firms were forced to establish work-from-home arrangements, with the share of

businesses reporting having employees working remotely doubling, from 20% to 42% (figure 1.4). The share of employees working some of their time from home skyrocketed from around 8% to about 40% (figure 1.1).

**Figure 1.4 – The pandemic led to many employers quickly introducing work from home**  
**Share of businesses with staff working from home by industry<sup>a</sup>, April 2021**



a. Industries are classified according to the Australian and New Zealand Standard Industrial Classification. Data for Agriculture and Retail trade businesses were not included in the ABS publication.

Source: ABS (*Business Conditions and Sentiments*, April 2021, Cat. no 5676.0.55.003).

This large-scale experiment gave many firms and workers their first experience of working from home. Firms and workers were able to discover the benefits and costs of remote work, and make adjustments to their work practices to make remote work more effective (such as adopting videoconferencing software).

Importantly, many gained the knowledge that working from home successfully was possible. Surveys from 2020 show that workers’ work-from-home experiences were generally positive (Beck and Hensher 2021), and the majority (85%) wished to continue doing some remote work (Mattey et al. 2020a; NSW IPC 2020). Tellingly, surveys in April 2021 indicated that a substantial proportion of workers still worked from home, even though public health directions at the time no longer required it.

- Almost a third (31%) of large employers reported that more than a quarter of their employees were working remotely (figure 1.5, panel a).
- One fifth of small businesses reported that more than a quarter of their employees were working remotely, and 13% said that more than three out of four were working from home (figure 1.5, panel a).

Many employers have also expressed support for continuing home-based work, and expect working from home to be a persistent feature of work (Beck and Hensher 2021) (figure 1.5, panel b).

### Box 1.3 – Who worked from home prior to the pandemic?

Prior to the COVID-19 pandemic, about 8% of employees worked from home — with more than half working one day or less from home per week. Relative to employees who did not work from home, those who chose to work from home prior to the pandemic were more likely to:

- be female
- be older than those who did not work from home
- work part time
- provide care for children and people with disability
- live in regional or remote areas.

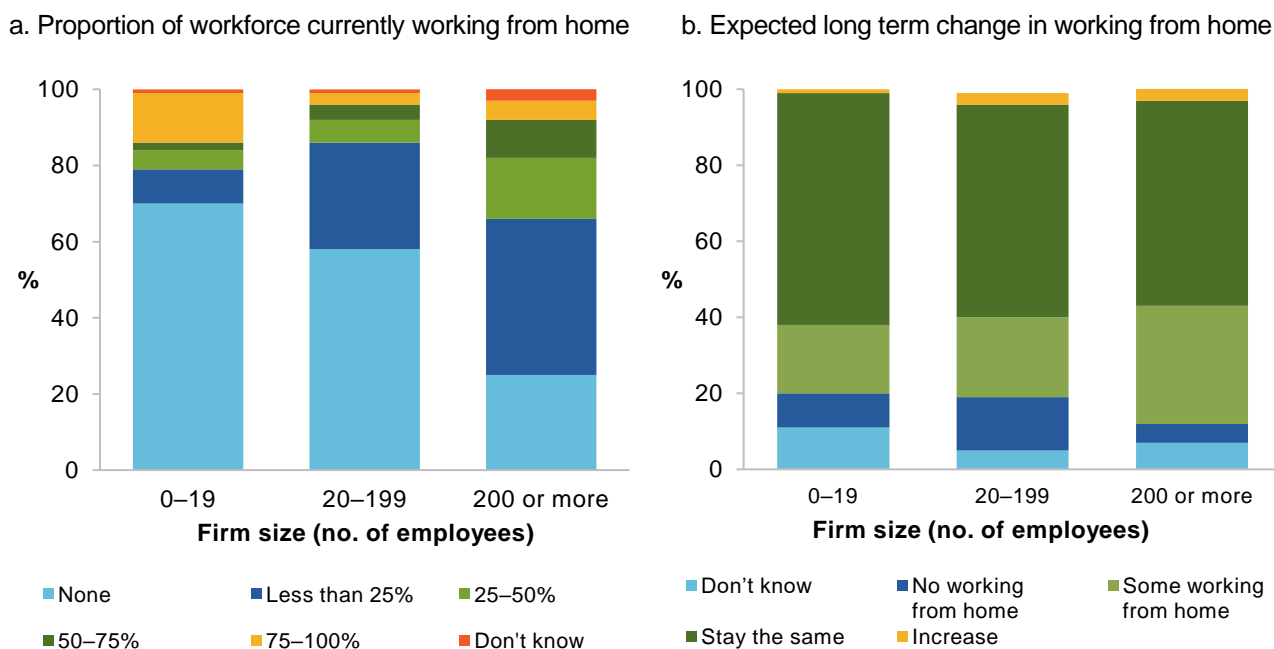
People who had the potential to work from home but did not do so before the pandemic were more likely to work full time, be single, have an Aboriginal or Torres Strait Islander background and live in a major city than the people who were working from home. They were less likely to be providing care.

#### Characteristics of people working from home prior to the pandemic

		Did not work from home			Worked from home	Total
		Potential to work from home	Cannot do job from home	Total		
<b>Female</b>	%	55.1	42.3	<b>46.8</b>	57.0	<b>47.3</b>
<b>Age</b>	Mean	41.0	38.4	<b>39.3</b>	45.4	<b>39.6</b>
<b>Single</b>	%	31.0	40.6	<b>37.2</b>	18.6	<b>36.2</b>
<b>Aboriginal or Torres Strait Islander</b>	%	1.3	1.9	<b>1.7</b>	0.6	<b>1.7</b>
<b>Location</b>						
<b>Major cities</b>	%	81.1	69.7	<b>73.9</b>	64.7	<b>73.4</b>
<b>Inner regional</b>	%	12.5	18.9	<b>16.6</b>	20.3	<b>16.8</b>
<b>Outer regional</b>	%	5.3	9.2	<b>7.7</b>	12.0	<b>8.0</b>
<b>Remote or very remote</b>	%	1.2	2.2	<b>1.8</b>	3.1	<b>1.9</b>
<b>Speaks English only</b>	%	79.5	77.6	<b>78.3</b>	84.1	<b>78.5</b>
<b>Cared for own or other child/children</b>	%	37.4	31.7	<b>33.7</b>	44.9	<b>34.3</b>
<b>Provided unpaid assistance to a person with a disability</b>	%	11.9	10.1	<b>10.7</b>	15.2	<b>10.9</b>
<b>Employed part-time</b>	%	26.7	37.7	<b>33.8</b>	49.9	<b>34.6</b>

Source: Productivity Commission estimates based on ABS (*Census of Population and Housing*, 2016, Cat. no. 2037.0.30.001).

**Figure 1.5 – Employers expect working from home to continue**



Source: ABS (*Business Conditions and Sentiments*, April 2021, Cat. no. 5676.0.55.003).

## Working from home is unlikely to return to pre-pandemic levels

As the pandemic in Australia eased in in late 2020 and early 2021, many of the people who had been required to work from home were able to return to work in a common workplace. Many people continued working from home, and employers were forced to consider changes in the way they organised their work. Employers are now — in the middle of 2021 — weighing up the pros and cons of having their employees in the office for all, some or even none of the working week, into the future.

It is unlikely that Australia will return to pre-pandemic levels of working from home. There are a number of reasons for this.

- While work from home during 2020 was not a typical work from home experience, it was better than expected for many (Barrero, Bloom and Davis 2021b). Australian survey data showed that many people who had to work from home in 2020 had a positive experience and were keen to continue working from home (Beck and Hensher 2021).
- The forced experiment provided employees and employers across the world with the opportunity to learn about working from home, and how it can be done effectively. (Barrero, Bloom and Davis 2021b). Technology that supports home-based work is thriving, with large increases in relevant patents throughout the pandemic (Bloom, Davis and Zhestkova 2021). As the pandemic eases and requirements to work from home are relaxed, employers will use the knowledge they have gained, and continue to adopt technologies that improve people’s ability to work from home.
- Employers and employees have both invested in physical and human capital. The pandemic has dramatically increased the use of a range of technologies — such as Zoom and Teams, which existed prior to the pandemic — that facilitate working from home. As these technologies have become more widespread people have gotten better at using them, increasing their productivity at home over time (Davis, Ghent and Gregory 2021).



- Attitudes towards working from home have changed. Many people have shown themselves that work can be done effectively from home, with about three quarters of people self-reporting that their productivity was the same or greater while working from home in 2020 (Beck and Hensher 2021).
- Many employees value the ability to work from home highly, and are willing to change jobs or accept lower wages in order to continue working from home (Barrero, Bloom and Davis 2021a, 2021b; Mas and Pallais 2017).

### 1.3 The second wave of experimentation

Given workers' desire to continue working from home — and employers' keenness to retain employees — employers and workers are now embarking on a second wave of experimentation.

This second wave of experimentation is different from the first. The initial uptake of working from home in 2020 was a forced experiment in which firms of different sizes and industries had to adopt the *same* model — where all employees worked remotely — and learned lessons about the suitability of working from home in their firm.

The second wave of experimentation with work from involves firms adopting *different* models based on their own judgment about what will work best for them. This second experiment will promote learning about work from home at two levels:

- The explicit lessons for the individual firm (seeing what does and does not work for them).
- The implicit lessons learned across the economy as a whole, as different models succeed and fail in different circumstances.

Hence there will be conscious, ongoing adjustment by firms, and aggregate (unplanned) adjustment across the economy.

This evolutionary process of learning and adaptation is likely to continue for some time. While it is not possible, nor meaningful, to predict the precise outcomes of this evolution, understanding the economic forces that underpin this process can help policy makers understand change and be prepared for it.

This paper aims to describe the economic processes guiding decisions about location of work that are made by employers and employees, and identify where policies can foster efficiency and where they could inhibit flexibility. It discusses the economic factors that are likely to influence decisions about where work is performed (chapter 2), and considers whether current regulatory and legislative settings are fit-for-purpose (chapter 3). It looks at the likely effect of increased work from home on cities (chapter 4) and possible implications for the health and wellbeing of individuals (chapter 5).



## 2. How will working from home evolve?

### Key points

- \* **Working from home has costs and benefits for both workers and firms. As workers typically benefit most from being able to work from home — in the form of time and money saved by not commuting — they tend to want more work from home than firms.**
- \* **Different preferences between firms and workers set the scene for a second wave of experimentation. Firms and workers will need to negotiate, and working-from-home arrangements will evolve through a process of testing, negotiation, reallocation and learning, both at the firm and economy-wide level.**
  - Firms will initially decide on work-from-home policies based on what they perceive best meets their needs. The hybrid model is likely to be popular, as it balances the benefits of working from home with those of working from the office. Firms will observe the outcomes of their own and others' choices, and adjust their policies in response.
  - Over time, workers will seek to move to jobs that better match their preferences. Some may be willing to trade off some wages in order to work from home, but this is unlikely to be widespread. And as firms and workers learn more about how to effectively work from home, the productivity (and wages) of those working from home are likely to improve.
  - Successful arrangements will thrive, while others will fall into disuse. Firms will learn from those around them, perpetuating successful models. Overall, those arrangements that facilitate high productivity when working from home are likely to become more prevalent.
- \* **Experimentation with working from home is likely to continue for some time, and long-term outcomes are uncertain. The long-term level of working from home is likely to be substantially higher than it was prior to the pandemic, but lower than the heights witnessed during successive lockdowns.**

As noted in chapter 1, the technology that enables people to work from home has existed for some time. But the COVID-19 pandemic forced the 'discovery' for many people that remote working was both feasible and beneficial. This newfound ability to work from home is, in economic terms, similar to a technology or supply-side 'shock' that has the potential to increase total wellbeing within the economy.

Working from home differs from many past innovations that have been deployed by firms to increase productivity, such as electricity, computing and the production line. In these cases, firms (rather than workers) benefitted in the first instance through increased output. By contrast, working from home benefits workers by allowing them to avoid the commute. Yet, it is firms that must determine work-from-home policies in the first instance.

The preferences of firms and their employees will not always neatly coincide, requiring a process of bargaining and negotiation between employers and employees. There will also be a dynamic process of reallocation as workers move between firms, and a continued process of learning, as firms and workers innovate and discover new models of work that suit them. These processes are the essence of the second wave of experimentation now occurring across the economy — one where many different models are tried and refined, with some rewarded by economic success and others not.

This chapter details the dynamics of this experiment. Section 2.1 discusses the considerations that drive workers' preferences for working from home. Section 2.2 discusses firms' preferences, and section 2.3 sets out how these interact to shape the evolution of work-from-home arrangements. Section 2.4 describes some possible longer-term paths of evolution, albeit in a necessarily tentative way. In putting forward likely outcomes, this chapter draws on an economic model of working from home set out in appendix B.

## **2.1 What influences workers' preferences to work from home?**

Workers' preferences to work from home are influenced by a variety of factors that affect their wellbeing (table 2.1). These include:

- the costs of the commute
- the flexibility to combine paid work and other tasks
- the ability to work effectively from home
- perceived and actual effects on long-term career prospects
- effects on mental and physical health, including the ability to socialise with colleagues.

These are discussed briefly in turn.

### **The costs of the commute**

Commuting can impose substantial costs on workers. In 2019, full-time workers in Australian major cities spent an average of around 67 minutes per day commuting, which in terms of forgone earnings amounted to \$49 (figure 2.1). For those taking public transport, the average time value and transport cost totalled \$57 per day.

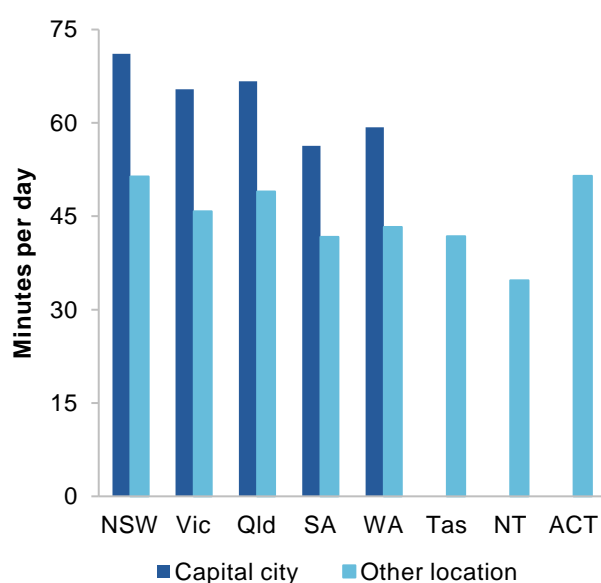
Avoiding the commute can therefore substantially benefit workers — survey evidence suggests that many workers consider it to be the most beneficial aspect of working from home (figure 2.2). Commuting one day less per week over the course of a year (assuming four weeks of annual leave) would save the average worker the equivalent of seven working days in travel time, and \$394 in public transport costs. Saving on the commute enables workers to undertake other activities — such as extra work, time with family, and caring and domestic tasks (Dockery and Bawa 2014; NSW IPC 2020). Where extra work is undertaken, this represents an increase in labour supply (appendix B).

**Table 2.1 – Potential costs and benefits of working from home for workers**

Potential costs	Potential benefits
<ul style="list-style-type: none"> <li>• Decrease in job effectiveness due to distractions at home or lack of suitable working space.</li> <li>• Fewer networking opportunities.</li> <li>• Less socialising with colleagues; increased isolation.</li> <li>• Blurring of lines between home and work, leading to extra hours of work and inability to ‘switch off’.</li> <li>• Higher energy costs (to heat or cool home during the day).</li> <li>• Costs associated with setting up a home office or purchasing a larger property to accommodate a home office.</li> <li>• Fewer training, development and promotion opportunities due to decreased visibility to managers.</li> </ul>	<ul style="list-style-type: none"> <li>• Commute savings (time and transport costs), resulting in more free time for other activities such as more work, exercise, housework and family time.</li> <li>• Flexibility to combine work and non-work activities.</li> <li>• Higher productivity due to greater autonomy to manage workflow and ability to concentrate on tasks (less interruption by colleagues).</li> </ul>

**Figure 2.1 – Avoiding the commute provides a substantial benefit**

a. Mean commuting time by state



b. Mean cost of commute by state<sup>a</sup>

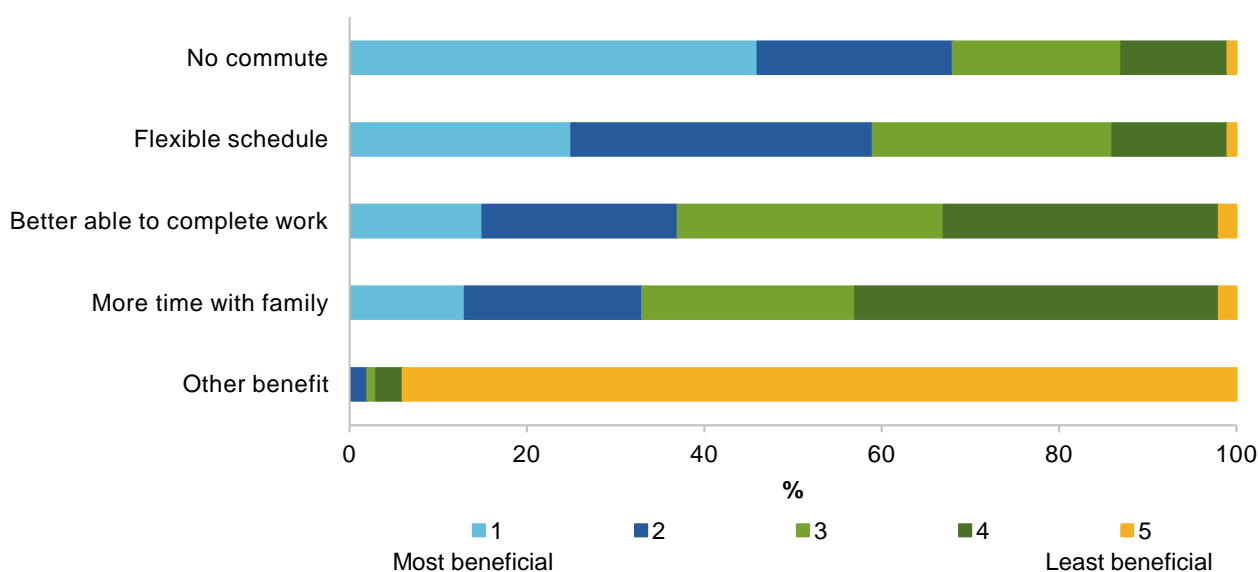


a. The mean value of the commute is calculated as the costs of a daily public transport fare plus forgone earnings of the time spent commuting. Forgone earnings are based on mean commuting time in capital cities (except for Tas, NT and ACT, where whole of state commuting times are used) and mean earnings per hour of full time employees. Mean earnings per hour are calculated as the average weekly ordinary time earnings of full time workers divided by 37.5 hours (assumed hours worked per week).

Source: ABS (*Average Weekly Earnings*, November 2019, Cat. no. 6302.0); Australian Automobile Association and SGS Economics & Planning (2020); *Housing, Income and Labour Dynamics of Australia*, wave 19.

The benefit of avoiding the commute is also likely to be larger for those with stronger attachments to the home, such as those with caring responsibilities or mobility impairments that make it difficult for them to attend a workplace. Avoiding the commute is likely to elicit a greater labour supply response from groups such as these (appendix B).

**Figure 2.2 – Avoiding the commute is the biggest benefit for many<sup>a</sup>**  
**Beneficial aspects of working from home, ranked 1 to 5**



a. The survey was conducted between 23 May and 15 June 2020 and consisted of a representative sample of 1457 people across all states and territories.

Source: Beck and Hensher (2021).

## Flexibility

The co-location of home and work affords workers the flexibility to combine work and non-work activities. For example, workers may simultaneously undertake work and housework (such as running a load of laundry), or switch between work and other activities over the course of the day (such as to pick up children from school). It also allows workers to work non-standard hours in order to successfully combine work and other responsibilities. Workers considered having a flexible schedule to be the second highest benefit of working from home, after avoiding the commute (figure 2.2).

However, the flexibility of working from home also carries risks — for example, it can lead to ‘blurring the lines’ between home and work, which can negatively affect wellbeing (chapter 5).

## Ability to work effectively from home

Whether workers prefer to work from home also depends on their ability to do so effectively, which is determined by their role, tasks, and family and housing circumstances.

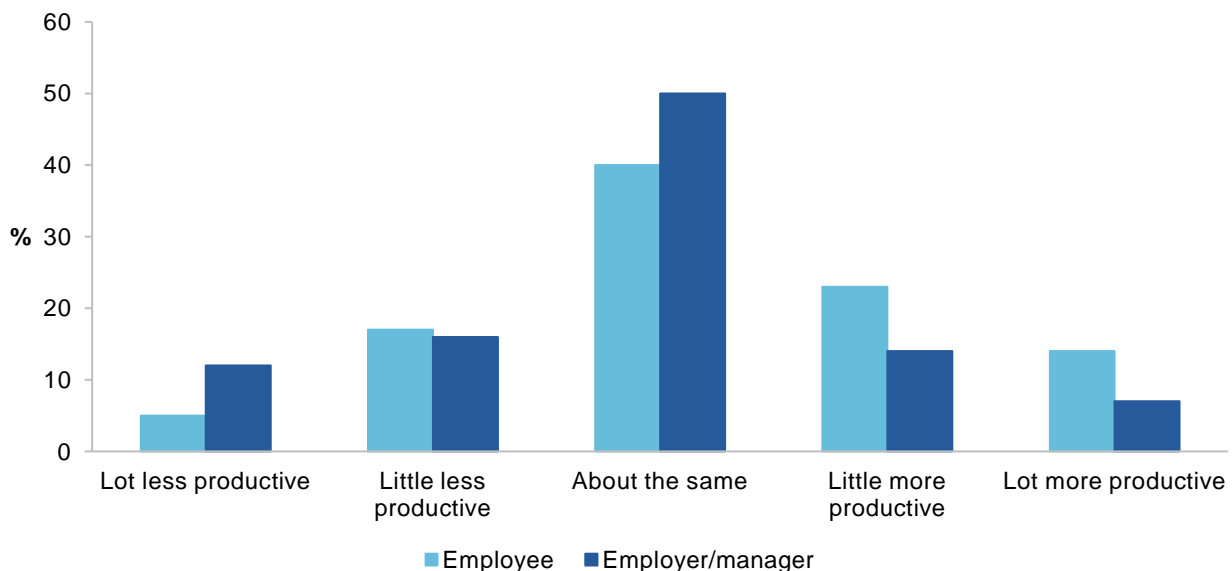
Some workers may not have a suitable workspace or the equipment they need at home. Evidence on whether this is the case is mixed — although a 2020 survey by Sheehan, Griffiths and Collie (2021) found that less than half (45%) of respondents working from home had a dedicated office space, Beck and

Hensher (2021) found that almost three-quarters of survey respondents (74%) worked from their own room or space (the remainder shared a room or space). About three-quarters of those surveyed also indicated that they had the equipment they needed to work from home successfully, but half indicated they needed more equipment to work as effectively as they would like (Beck and Hensher 2021).

The presence of others at home (such as children, older parents or housemates) can also affect workers' ability to work effectively and without interruption. This is not only limited to periods when COVID-19 stay-at-home orders are in place — for example, children may be at home after school or during school holidays in 'normal' times.

About three-quarters of workers surveyed considered that they were at least as productive working from home as from the office (Beck and Hensher 2021), although employers had a slightly different view (figure 2.3). Despite these slight differences, it is notable that the most frequent view of both employers and employees was that productivity was 'about the same', with a fairly even distribution on either side of this central view.

**Figure 2.3 – Employees and employers have different views about productivity when working from home<sup>a</sup>**



a. The survey was conducted between 23 May and 15 June 2020 and consisted of a representative sample of 1457 people across all states and territories.

Source: Beck and Hensher (2021).

## Effects on long-term career prospects

Working from home has the potential to affect career prospects due to (actual or perceived) relative job effectiveness, reduced opportunities for collaboration and networking, and reduced face-to-face interaction with managers. Workers who do not spend (enough) time in the office may be 'out of sight, out of mind' (McCloskey and Igbaria 2003; Weinert, Maier and Laumer 2015), and may have fewer opportunities for learning and training. While the impact of working from home on career prospects can be mitigated by workplace policies and practices — for example, managers may actively seek to ensure that all employees have networking opportunities regardless of location of work — not all employees may 'play by the new rules', leaving high-quality workers who prefer remote work behind (Tadros 2021). And regardless of whether risks to career prospects are real,

*perceptions* of such risks can deter workers from working from home. Chapter 5 contains a more fulsome discussion on the potential effects of working from home on long-term career prospects.

## Mental and physical health effects

Working from home can be associated with detrimental mental and physical health effects, such as increased social isolation, increased hours of work, ‘role strain’ (the strain of balancing work and family responsibilities) and decreased exercise (Eurofound and ILO 2017; Ráthonyi et al. 2021; Thomas and Ganster 1995). However, working from home can also improve mental and physical health by freeing up more time (which would otherwise be spent commuting) for domestic tasks, recreation, family and exercise. Workers may experience both positive and negative effects, and the net effect is likely to be mixed across individuals. Chapter 5 discusses the evidence on the mental and physical health effects of working from home in more detail.

## 2.2 What do employers consider?

When considering working-from-home arrangements, firms are likely to consider how working from home affects:

- productivity
- management activities and costs
- workplace culture
- capital costs, such as office space
- staff attraction and retention (table 2.2).

Each of these is discussed below.

**Table 2.2 – Potential costs and benefits of working from home for workers**

Potential costs	Potential benefits
<ul style="list-style-type: none"> <li>• Lower productivity if employees cannot co-ordinate, collaborate and share knowledge effectively.</li> <li>• Workplace culture decays due to fewer or lower-quality interactions among workers.</li> <li>• Potential for remote workers to shirk; additional costs to monitor employees or change workplace processes.</li> <li>• Capital expenditure on equipment and telecommunication systems to enable working from home.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher productivity if employees have better ability to manage their time and concentrate, and/or are better rested because of the lack of commute.</li> <li>• Greater output if workers work longer hours (and productivity does not decrease).</li> <li>• Rental savings on office space.</li> <li>• Ability to recruit from a greater geographic pool.</li> <li>• Retention of staff who prefer working from home.</li> </ul>



## Productivity

Changing the location of work has the potential to affect productivity both positively and negatively. On the one hand, physical distance between colleagues may increase co-ordination costs, reduce serendipitous exchanges and knowledge-sharing, stymie creativity and decrease the effectiveness of collaborative processes. Home environments may also not be conducive to effective work — as noted above, workers may not have a quiet workspace or may be distracted by family members. Separation from managers may also afford workers the opportunity to shirk (managers' monitoring abilities are discussed below).

On the other hand, workers may be more productive at home because, for example, they:

- have better control over their time — they can schedule meetings at times that suit them, and ignore requests that are not urgent. They can also undertake work at times of the day that they are most productive (for example, early in the morning when they are most alert, or at night after children have gone to bed)
- enjoy better work–life balance (due to the lack of commute) and are better rested for work
- are able to work longer hours and complete more work due to the lack of a commute. Although strictly not a productivity increase (because inputs — hours worked — have also increased), firms' output can increase without a commensurate increase in labour costs because many knowledge workers are paid fixed salaries and are unlikely to be compensated for the extra hours worked. The wellbeing implications of longer working hours when working remotely, and workers' ability to disconnect, are discussed in chapter 5.

Evidence is mixed on how working from home affects productivity in practice.

- A randomised control trial of call centre employees at a Chinese travel company found that working from home increased productivity by 4% due to a quieter and more convenient working environment (Bloom et al. 2015). Another study focusing on the call centres of a Fortune 500 online retailer also found a productivity increase of 7.5% (Emanuel and Harrington 2021). However, findings based on call centre workers do not necessarily apply to knowledge workers, whose jobs involve complex tasks and collaboration.
- Research measuring the productivity of professional workers in complex jobs using personnel and analytics data from a large Asian IT company showed that working from home during the pandemic decreased productivity by 8–19% (Gibbs, Mengel and Siemroth 2021). This was due to an increase in working hours (without a corresponding increase in output), an increase in time spent in meetings co-ordinating and communicating with co-workers, and the presence of children at home (for some workers). Lost networking opportunities may have also played a part. However, this was during a period when schools were closed and children were at home due to COVID-19 restrictions, which is likely to have negatively affected workers' productivity.
- As noted above, in a 2020 Australian survey, both employers and employees reported mixed levels of staff productivity when staff worked from home (figure 2.3). Both employers and employees saw productivity as 'about the same', although at the tails of the distribution, a slightly higher proportion of managers than employees reported that staff productivity was lower when working from home.

However, productivity in this context is not static. Especially in this early stage of experimentation, there is the added likelihood that, as firms and workers learn and adapt, they become more effective at working from home (Davis, Ghent and Gregory 2021). This would see productivity when working from home increase over the long term, which could in turn increase firms' demand (or reduce their reluctance) for work conducted from home (appendix B).

Overall, the productivity effects of working from home are likely to vary across industries, organisations and workers, and depend on the nature of workers' tasks, investments in work-from-home capability, and employees' individual characteristics and circumstances.

## Management activities and costs

Closely related to productivity is whether firms consider that they would be able to effectively manage a remote or hybrid workforce. For example, managing a remote workforce may require more scheduled communication, because incidental interactions that would naturally occur in an office are likely to be less frequent. Monitoring may be easier for low-skill or routine jobs (such as call centre operators), where outputs can be easily measured. For more complex 'knowledge' jobs, managers may have to rely more on outputs (work delivered), rather than inputs (time spent on tasks), because they are unable to directly observe how workers spend their time. Deloitte CEO Adam Powick, when explaining the firm's new 'work from anywhere' policy, stated that:

there will be a greater focus on outcomes, as opposed to inputs ... it is less about when and where you work but more about the value and outcomes that you deliver. (Bennett 2021)

For hybrid models, firms may need to have different management practices for office- and home-based workers — which adds to costs — or adapt management practices so they are effective in monitoring both groups (Gratton 2021). Management costs may also increase because of the need to implement monitoring systems for remote employees' productivity and wellbeing, and to train employees in new ways of working (Holmstrom and Tirole 1989).

## Workplace culture

Workplace culture refers to accepted norms and practices communicated between colleagues through informal interactions. Cultural decay, which results from an increase in remote working and an associated decrease in social interaction and affiliation, concerns many employers (Mattey, et al. 2020b; The Economist 2021), and may cause them to curtail work-from-home practices or designate days on which it is compulsory for employees to attend the office (to increase social interaction). Apple, for example, announced in June 2021 that it will require most employees to attend its office on Mondays, Tuesdays and Thursdays (Miller 2021). In making the announcement, Tim Cook, Apple's CEO, said:

I know I'm not alone in missing the hum of activity, the energy, creativity and collaboration of our in-person meetings and the sense of community we've all built. (Miller 2021)

## Capital costs

Moving to remote or hybrid work can also alter capital costs. Employers may be able to save on office space, and therefore rent — for example, working from home saved a call-centre travel company \$1400 per remote worker per year due to the avoided capital costs (office and IT) (Bloom et al. 2015). That said, capital costs may not be adjustable in the short term (for example, firms may be locked into long-term office leases), and firms may be reluctant to relinquish office space while they are still experimenting with working from home. Capital savings may therefore take some time to be realised.

In addition, rental costs can be affected by other firms' decisions about offices. If some firms decide to downsize or relinquish offices, or move to lower-density areas, commercial rents in cities will decline and mitigate rental costs for remaining firms. Lower rents may also draw other firms to the central business districts of capital cities, and overall demand for commercial offices may remain stable, albeit at reduced rents. This possibility is discussed in more detail in chapter 4.

While working from home may have the potential to decrease capital costs through rental savings, it may also increase capital expenditure on equipment such as laptops, ergonomic chairs and headphones for

workers' home offices. Firms may also be required to invest in (and maintain) digital infrastructure to enable remote working.

### Attracting and retaining staff

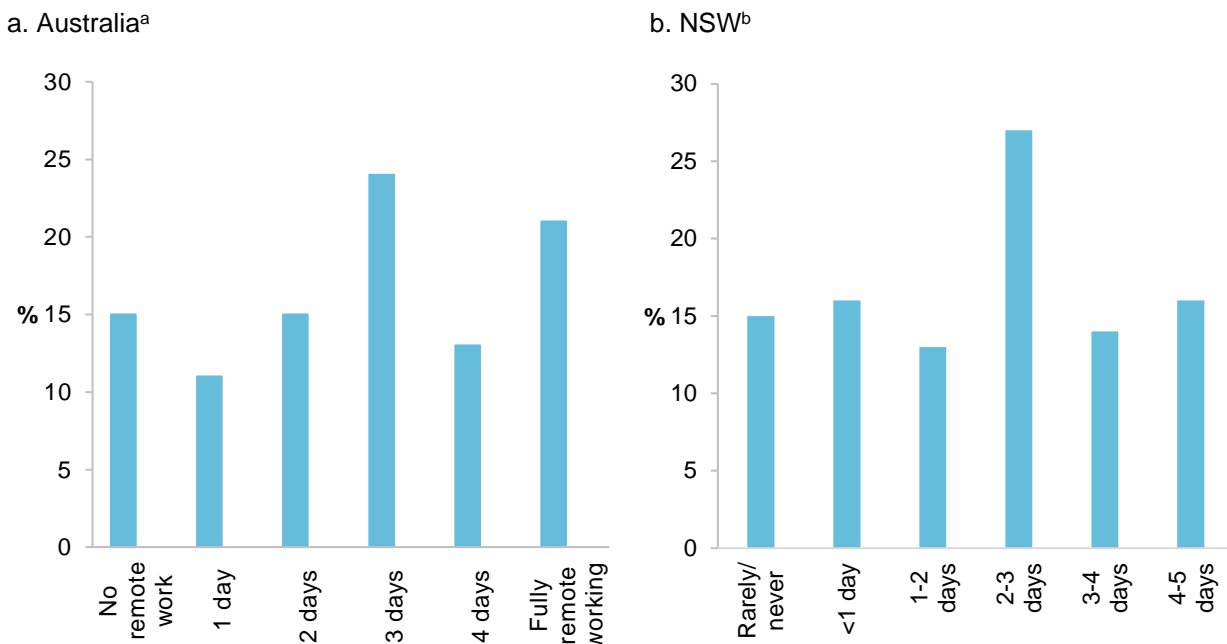
If workers prefer to work remotely, firms may choose to offer these arrangements to retain and attract staff. Implementing remote working arrangements also increases the pool of potential candidates for recruitment by casting a wider geographic net. However, if a sizeable portion of workers prefer to be in the office, firms will have to weigh up the costs and benefits of adopting (full or partial) remote work arrangements.

## 2.3 Reconciling preferences: testing, negotiation, reallocation and learning

The preferences of firms and their workers will not necessarily align. This partly reflects that the largest perceived benefits of working from home — flexibility and the avoided commute — improve employees' wellbeing . It could also reflect differing perceptions of productivity when employees work from home, as well as the added costs of management of a hybrid workforce.

Perhaps unsurprisingly, evidence suggests that workers generally prefer more work from home than employers. Surveys show that, going forward, a significant proportion of employees (27 to 39%) would prefer two or three days a week at home (figure 2.4).

**Figure 2.4 – Most workers would like to work from home at least some of the time**  
**Number of days per week workers would like to work from home**



**a.** Data are from the 2020 Workforce Sentiment Survey, which interviewed a sample of 1002 Australian respondents over May 2020. The sample was representative of the Australian population with respect to age and gender. **b.** Data are from the NSW Innovation and Productivity Council survey of 1500 NSW employees in August and September 2020.

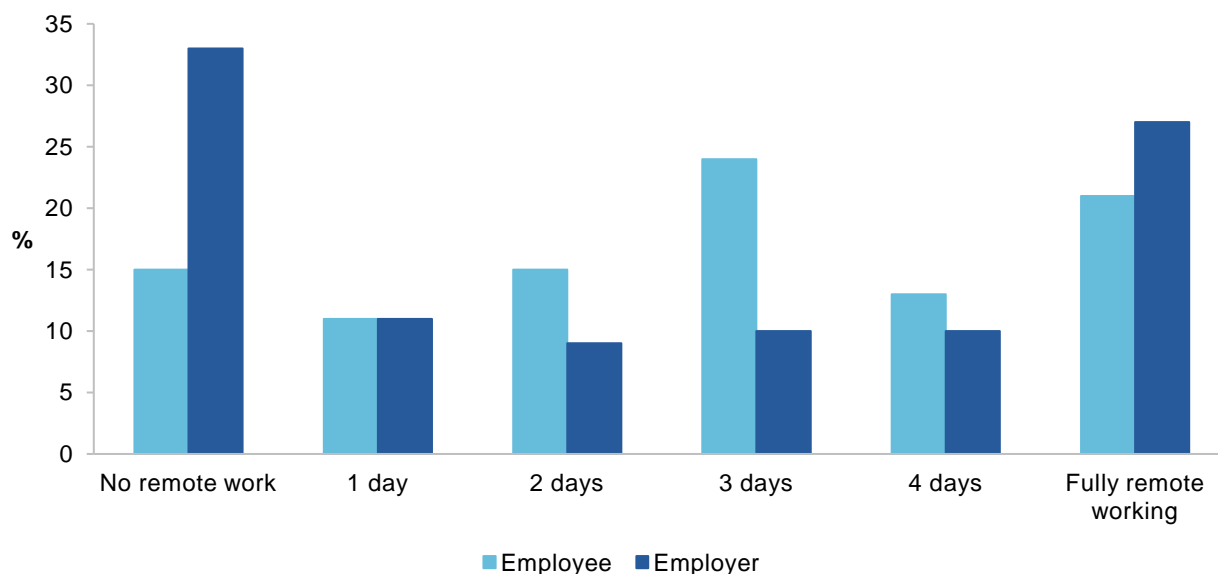
Source: Matthey et al. (2020b); NSW IPC (2020).

Firms, on the other hand, are more heterogenous in their work-from-home preferences, reflecting diversity in economic function (and hence the relative productivity of working from home), management practices, cost structures and the subjective views of management. Interestingly, more firms than workers prefer the fully remote model (figure 2.5).

These divergent preferences are just a starting point. Over time, an economy-wide process of testing, negotiation, reallocation and learning will act to at least partially reconcile these different preferences. These elements of testing, negotiation, reallocation and learning are not necessarily sequential, but are dealt with in turn below.

**Figure 2.5 – More employees prefer a mix of home- and office-based work, but more employers want a fully remote model<sup>a,b</sup>**

**Number of days per week employers and employees would like remote work**



**a.** The Employer Sentiment Survey surveyed a sample of 121 respondents over the period of September to October 2020. The sample covered a variety of large to small businesses, across multiple industries. **b.** The 2020 Workforce Sentiment Survey interviewed a sample of 1002 respondents over May 2020. The sample was representative of the Australian population with respect to age and gender.

Source: Matthey et al. (2020b).

### Testing: the firm’s choice

In the first instance, employers need to determine a work-from-home policy. They will do this in the knowledge that other firms are trying alternative approaches, all of which will be tested in the markets for products and labour. They will choose a model based on their assessment of the relative productivity of their staff working from home and the scope for capital cost savings, as well as morale and staff retention issues. Even a decision not to allow any work from home constitutes a choice. Hence, three main options present themselves, with some potential variations.

- **Fully remote work** may be chosen where: the capital costs associated with a centralised workplace are high; access to national or global talent is important; there are clear ways to overcome collaboration and co-ordination challenges; workers can be at least as productive as when they work centrally; and firms can easily monitor productivity.

- **Fully centralised work** may be reinstated where: face-to-face interaction is essential to effective work; workers are less productive at home or managers cannot monitor productivity; co-ordination between workers is difficult and capital costs do not decrease when work is conducted from home.
- **Hybrid arrangements** may arise where: some work can be done effectively from home but there is still a need for collaboration; there is some — but limited — scope for capital savings; and labour markets are sufficiently tight that firms face pressure to offer part-time remote arrangements in order to retain and recruit staff. Hybrid arrangements balance the benefits of working in the office — being able to collaborate, innovate and interact with colleagues face-to-face — with the flexibility, quiet and lack of commuting associated with working from home. While the hybrid approach has obvious appeal, it may be more difficult to implement effectively, including because managers must co-ordinate which days workers are in the office (Bloom 2021).

Clearly, the hybrid category is broad and allows many possible variations. An obvious source of variation is the amount of remote work *which* is allowed under different approaches. In addition, some firms may specify *which* days work must be conducted in different locations. There is also a distinction between structured hybrid arrangements (a pre-determined quota or schedule of days to be worked from home) and more informal, ad-hoc arrangements, where staff work from home occasionally when circumstances permit.

Another variation of the hybrid model is ‘work-from-anywhere’ policies, which give workers choice about where they work. In some cases, firms may expect almost all work to be conducted remotely, which enables them to recruit widely. In others, firms may expect regular meetings between workers or with clients. For example, Deloitte, which has a work-from-anywhere policy, does not expect a large proportion of its employees to work entirely remotely due the client-based nature of its work (Bennett 2021).

Table 2.3 summarises the firm characteristics likely to be associated with different approaches, with examples of firms that have adopted various policies.

## The beginnings of negotiation

The initial decision by firms is only a first step in the process of experimentation and evolution that will follow. Workers will seek to negotiate with employers where their preferences diverge. Where workers have a strong preference to work from home, they may need to offer some benefit to their employers, such as agreeing to perform tasks at home that are easily segmented and done with increased (or similar) productivity. They may also agree to work longer hours, given that they are able to save the time that would otherwise be spent commuting.

Some workers may even be willing to accept lower wages to work from home. Survey data from the United States suggests that the ability to work from home two or three days may be worth the equivalent of a 7% pay rise to workers (Barrero, Bloom and Davis 2021b). Experimental data (also from the United States) similarly suggests that workers are willing to accept an 8% reduction in pay in exchange for the option to work from home (Mas and Pallais 2017). In turn, employers might be more attracted to their staff working from home if it came with significant labour cost savings.

In practice, there are some reasons to doubt whether a negotiated pay reduction would be a realistic outcome. First, the valuations expressed in surveys do not always translate into real world behaviour. Second, nominal wage reductions are uncommon.

In any event, there is also some doubt as to whether such a reduction in labour income would persist — as firms and workers gain individual and collective experience with working from home, the productivity of home-based work is likely to increase, putting upward pressure on wages. There is evidence that the productivity of home-based work is already increasing — an analysis using American survey data suggests that being forced to work from home during the pandemic has led to a 46% increase in work-from-home productivity (Davis, Ghent and Gregory 2021).

**Table 2.3 Work-from-home arrangements, firm characteristics and examples**

	Likely firm characteristics	Examples
<b>Fully remote</b>	<ul style="list-style-type: none"> <li>• High capital costs</li> <li>• Access to talent is important</li> <li>• Easy to overcome co-ordination and collaboration challenges</li> <li>• Easy to monitor or measure productivity (outputs can be counted)</li> </ul>	<ul style="list-style-type: none"> <li>• Gitlab</li> <li>• Quora</li> <li>• Basecamp</li> <li>• Optus (call centre employees)</li> </ul>
<b>Fully centralised (office-based)</b>	<ul style="list-style-type: none"> <li>• Face-to-face interaction essential</li> <li>• Workers are less productive at home or managers cannot monitor productivity</li> <li>• High co-ordination costs</li> <li>• Inability to save on capital costs (such as office rent) by working remotely</li> </ul>	<ul style="list-style-type: none"> <li>• JP Morgan Chase (USA)</li> <li>• Goldman Sachs (USA)</li> </ul>
<b>Hybrid</b>	<ul style="list-style-type: none"> <li>• Some work can be done effectively from home, but collaboration is also important</li> <li>• Scope for some limited capital savings by working from home</li> <li>• Firms face a tight labour market and workers want to work from home</li> </ul>	<ul style="list-style-type: none"> <li>• ANZ</li> <li>• Apple</li> <li>• Google<sup>a</sup></li> <li>• City of Sydney</li> <li>• Herbert Smith Freehills</li> <li>• Victorian Public Service</li> </ul>
<b>Work-from-anywhere</b>	<ul style="list-style-type: none"> <li>• Similar to hybrid</li> <li>• Access to talent is important</li> <li>• Willing to rely on output indicators (rather than inputs) to assess workers' performance</li> </ul>	<ul style="list-style-type: none"> <li>• Atlassian</li> <li>• Square</li> <li>• Telstra</li> <li>• Twitter</li> </ul>

a. Google has a mixed approach where some employees operate in a hybrid model and others are fully remote.

Sources: Atlassian (2021); Baird (2021); Buildremote (2021); Dempsey (2020); Dwoskin (2020); Fernyhough (2020); Gitlab (2021); Miller (2021); Novet (2021); van der Merwe (2020); Verlaine and Benoit (2021); Victorian Secretaries' Board (2021); Wootton (2020).

## Reallocation and learning

Time also affords workers an additional tool with which to negotiate — mobility. Differences in employer and employee preferences for working from home suggest there is likely to be some reallocation of labour across firms, as workers seek employers with compatible policies on working from home.

Anecdotal evidence suggests that some people are already leaving their jobs to pursue the flexibility offered by remote work, or because they are reluctant to be in an office while COVID-19 is still circulating within the community (Weber 2021). This switching was being aided by a tightening labour market before the impact of the Delta variant of COVID-19 in 2021.

Survey evidence from the United States also suggests that about 40% of workers would seek another job if their current employer required a full return to the office. This process has been described as a 're-sorting of workers with respect to a newly salient job attribute — namely the scope for remote work' (Barrero, Bloom and Davis 2021a, p. 1).

Switching and negotiation on wages provides firms with information about what attracts (desirable) workers. For example, if firms observe that fully remote arrangements attract high-quality workers, they are more likely to offer these arrangements (or, alternatively, pay higher wages for office-based work).

In this way, switching and negotiation set in motion a process of experimentation in which firms try different arrangements (including the adoption of different technologies), observe outcomes, relinquish unsuitable arrangements and maintain those that yield desirable results. This process of learning has been observed in firms' recent behaviour. Google, for example, had announced in December 2020 that workers were to spend three days a week in the office, but after observing that other employers were offering greater flexibility, said in May 2021 that 60% of its employees would work on site a few days a week, 20% would work in new locations, and the remaining 20% would be fully remote. It also increased the length of time that employees could temporarily work away from their assigned office from two weeks to four weeks per year (Novet 2021). Square, in announcing its permanent work-from-home policy in May 2020, also said that:

Over the past several weeks, we've learned a lot about what it takes for people to effectively perform roles outside of an office, and we will continue to learn as we go. (Schiffer 2020)

The simultaneous nature of this wave of experimentation across firms also generates a form of *collective* learning. Some of this learning is conscious and explicit — where firms observe others and imitate successful innovations. Imitation can be imperfect, creating variations that add to the process of experimentation. Some of the collective learning will be unconscious and unplanned — as some models are simply rewarded and others penalised by market forces, with more successful models surviving and growing over time.

## The uncertain journey: productivity, wages and wellbeing

The term 'experiment' connotes uncertainty. No one can be sure what scenarios will play out and where this evolution will lead. What follows is some qualified conjecture, based on judgment rather than the kind of evidence that will only emerge over time.

### How much working from home?

At this point, little can be known about the precise amount of working from home that will occur in the post-pandemic economy. There is good reason to believe that it will settle somewhere between the pre-pandemic level and the peak levels prevailing during successive lockdowns.

Estimates of the share of the workforce that could potentially work from home (chapter 1) provide an indication of the size of the possible change. Many knowledge jobs in professional services, finance or creative industries have tasks that can be done from home, as well as elements that are more conducive to in-person interaction in a central location. But, as the discussion above makes clear, not all jobs that can be done from home will be done from home — whether or not remote work occurs is ultimately an outcome of economic interactions between employers and their employees.

Before the pandemic, about 8% of employed people worked about 2% of total hours from home, but about 35% of people had jobs that could be done from home (chapter 1). If *all* of the people who could work from home did so on a hybrid basis — part-time workers working one day per week, and full-time workers working two days per week from home — still only 13% of all hours would be done remotely. If half of them were to work from home — a more likely scenario — then the proportion of total hours worked from home would be

expected to be close to 7%.<sup>2</sup> Increases of this magnitude would represent a substantial and noticeable change in a very short period of time, but arguably do not represent a fundamental or revolutionary breach with the past — the physical workplace would remain the dominant location of work.

This is important when it comes to thinking through the implications for productivity (below), regulatory frameworks (chapter 3), cities (chapter 4) and broader issues of wellbeing (chapter 5). A recurring theme is that despite this significant change in work patterns, there is considerable scope for a smooth adjustment such that the implications for these other domains should not be overstated.

## The productivity impact

Some concerns have been expressed about the productivity implications of more work being done from home. Although the most common view of employers and workers is that productivity at home is 'about the same' as in the office, both managers and employees consider that in some cases productivity has been lower (figure 2.3, section 2.2).

While decreased productivity may be true for some individuals, there are grounds for optimism at the economy-wide level. As the examples in table 2.3 show, firms are selecting an approach to working from home that makes economic sense for them. Those that perceive the biggest productivity gap between working centrally and at home are more likely to require a significant face-to-face presence and vice versa.

Moreover, the same logic applies at the level of the individual worker within the hybrid model — the ability to work from home is likely to be extended selectively (Barrero, Bloom and Davis 2021b). Firms are unlikely to willingly sacrifice productivity, and so have incentives to systematically select higher-productivity workers to work from home. This implies that much of the initial increase in work from home will be performed by workers for whom (and in firms where) productivity is roughly equivalent or higher than in the central workplace.

Could this pattern change as the market adjusts? It is theoretically possible that, as labour reallocates, some workers could opt to do less productive work at home by finding an employer willing to pay lower wages (to compensate for the lower productivity). This is expected only when the wage reduction is less than the (monetary or non-monetary) benefit of working from home to the employee, such as the avoided commute or greater autonomy over workflow.

This could be a pattern followed by some workers, but it is unlikely to be the dominant scenario. Workers who most value working from home have a strong incentive to find a job and an employer that can combine working from home with high productivity (and higher wages). Firms that are able to achieve work from home without a reduction in productivity could outbid those which cannot, putting upward pressure on wages for work done from home. Hence the process of sorting, resulting in better matches between firms and workers, can limit the risk of lower productivity at the economy-wide level.

Over time, the process of innovation and learning — through technology and business practices — is likely to move the whole productivity distribution in the direction of making work from home easier and more effective over time, albeit at an uncertain pace.

So while the impact on productivity of working from home for an individual worker is ambiguous, it is plausible that at the economy-wide level, productivity will not be adversely affected to any material degree by a sustained increase in working from home, and could generally rise.

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<sup>2</sup> If all full-time employees who can work from home did so for three days per week, the total number of hours done remotely would be about 18% of all hours worked. This is a prediction in line with that offered by Barrero, Bloom and Davis (2021b), who predicted that one in five workdays in the United States can be done from home after the pandemic.



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## Working from home provides a substantial, non-monetary benefit to many people

The effect on wellbeing is more straightforward. There is a clear non-monetary gain to many workers who avoid the commute and achieve greater flexibility from working at home. Given the expected prevalence of the hybrid model, even a modest percentage point increase in hours worked from home could be spread across a much larger percentage of the workforce. Hence the benefits could be quite widespread.

Much of this gain will not translate into higher gross domestic product per capita, given the non-monetary nature of the benefits. But it is nonetheless of clear and significant value, as shown by survey evidence about the willingness of workers to change jobs or trade off pay in order to be able to work from home. Chapter 5 looks at some of the wellbeing issues that workers and firms will need to contend with, as well as equity implications. But where workers themselves express a preference for some work from home, there is a reasonable presumption that it makes them better off overall. These wellbeing effects underscore the fact that, across the economy, there are large incentives to make working from home a viable option and to get better at it over time.

## 2.4 The longer term

If the amount of work that will be done from home in the short to medium term, and its associated effects, are uncertain, then the long-term evolution of work from home is even more so. Other than suggesting that the post-pandemic level of working from home will be substantially higher than it was before the pandemic, but lower than lockdown-induced peaks, no meaningful prediction can be made as to where the economy might settle. Many scenarios could unfold, each with their own internal dynamics. Three possible scenarios are described (not predicted) below.

### The inexorable shift

One possible scenario is that levels of working from home, having risen during the pandemic, continue to rise into the future. Under such a scenario, it would be as though the initial rise in working from home created additional momentum for further increases.

This could be driven by continued advances in technology, in response to the increased demand for remote work. Technological progress could be combined with the lessons from experimenting with different approaches to remote work, which would continually reduce the costs of working from home. Better ways of facilitating collaboration and creativity could be found, mitigating the downsides of working from home on productivity. In addition, technology could give a broader range of occupations and industries the option of remote work, for all or part of their regular hours worked. More firms might move to being fully remote, but considerable momentum would likely come from firms moving from a fully centralised to a hybrid model (or increasing the levels of work from home within hybrid models).

If this scenario were to unfold, the long-term implications for cities and broader societal implications (chapters 4 and 5 respectively) could be significant, on par with other major technological innovations of the past such as the development of the car or the computer.

### The steady state

A second scenario is that levels of working from home achieve a level between the pre-pandemic and lockdown levels, but then remain relatively stable. This would suggest that the forced learning experience of the COVID-19 pandemic revealed a previously untapped but finite opportunity for more remote work, which

then hit some natural physical and economic limits. This scenario suggests that in addition to ‘discovering’ the feasibility of remote work, we also discover more explicitly the value of in-person engagement.

It is likely that such a scenario would be characterised by widespread adoption of hybrid arrangements. Although hybrid arrangements can be costly (requiring managers to concurrently monitor two sets of employees and co-ordinate workers to ensure the benefits of in-person interaction can still be realised), firms may face pressure to adopt them because it satisfies both employers’ desire to have some in-person work, and workers’ desire to have some remote work. Hybrid arrangements could thus become increasingly accepted as the norm, as firms and workers get better at segmenting the tasks that make up a job. This scenario could also be consistent with a wage premium for those jobs which cannot be done from home, leading some workers to prefer this alternative.

## Measured retreat

A third scenario is that levels of working from home settle somewhere between the pre-pandemic level and the lockdown peak after the COVID-19 pandemic, but then fall back over time, although remaining higher than pre-pandemic levels. This scenario would be consistent with the hybrid model proving difficult to manage in practice, leading firms to gravitate to either fully remote or fully centralised models. Workers might then face a more stark choice as to their preferred arrangements.

This scenario could also reflect changing perceptions of the wellbeing implications of working from home (chapter 5) and perhaps a growing realisation that human capital development and career advancement are best progressed by being present in a central workplace, particularly if other workers are making that choice. This could be consistent with the structured hybrid model gradually give way to a model of ad-hoc, occasional and less frequent, working from home.

Naturally, under this scenario, changes to cities and settlement patterns would be negligible and some of the broader societal impacts of working from home would be less salient.

In all three scenarios described above, there would be a greater prevalence of working from home than prior to the pandemic. (Even where firms gravitate to the poles, the number of fully remote workplaces is likely to exceed that before the pandemic). Hence, the change in working from home will still most likely represent a significant, relatively sudden and enduring change to the Australian labour market.

The chapters that follow discuss the implications of this change for regulation, cities, equity and wellbeing.

### 3. The role of regulation in the transition to a work-from-home world

#### Key points

- \* **With the increase in working from home, governments need to monitor regulations to ensure they are safe and fair as well as flexible and efficient, and continue to reflect the reality of many people's daily work.**
- \* **Australia's work health and safety (WHS) laws are flexible and seem well-placed to manage an increase in home-based work. WHS is the joint responsibility of employers and workers, and this responsibility applies wherever work is carried out, including in the home.**
  - Case law regarding the responsibilities of employers in addressing common household risks and supplying equipment suggests that current WHS laws are reasonable and do not impose undue costs. More cases will emerge as many more people work from home, and governments will need to ensure that WHS laws do not impede widespread and sustained working from home.
  - The review of the model WHS laws in 2023 provides an opportunity for governments to ensure that WHS legislation is keeping pace with changing work practices.
- \* **While the workplace relations system provides the backdrop for interactions between employers and employees, policies at the firm level and individual contracts are likely to be the main ways through which work-from-home arrangements are struck. The formal workplace relations system has a limited effect on the uptake and conditions associated with working from home.**
  - The *Fair Work Act 2009* (Cth) provides some employees with a right to request home-based work based on their individual circumstances. This includes parents of young children, carers, people with a disability, older workers, and people experiencing family violence. Modern awards, enterprise agreements, workplace policies and some state legislation give broader groups of workers the right to request, and some improved access to, home-based work.
  - Employer decisions to move to a remote only model are subject to obligations to consult with employees about these decisions.
- \* **Throughout the pandemic, modern awards were modified to allow increased flexibility, which shows that the workplace relations system is able to adapt and overcome rigidities.**

The shift to more widespread working from home has many potential benefits — it may improve the productivity of many firms and increase the wellbeing of many workers. The speed at which work practices have changed also brings potential risks, particularly in systems that were designed for — and still need to function in — centralised workplaces.

As noted in chapter 2, experimentation with different models of working from home will involve a process of negotiation, trial and error and adjustment. The interests and preferences of employers and employees will not always perfectly coincide.

This process will play out in the context of a regulated labour market. Governments regulate labour markets to ensure workplace safety and to protect basic pay and conditions for workers, among other things. These regulatory approaches are often premised on work being performed in a common physical space, such as an office.

This raises the question as to whether existing regulatory approaches are fit-for-purpose in a labour market with substantial numbers of people working from home. If regulations are unnecessarily restrictive, or are no longer relevant to remote work, they could stand in the way of mutually beneficial bargains between employers and employees and frustrate the evolution of work practices (chapter 2). On the other hand, some harms might become more likely in the context of remote work, in which case regulatory frameworks need to be tested for their adequacy in the face of new challenges.

In that light, this chapter discusses the ways in which regulatory frameworks might affect the transition towards more widespread and sustained working from home, and how governments can help to maximise the aggregate gains to both workers and firms from increased working from home. Section 3.1 discusses work health and safety regulations, and section 3.2 covers the workplace relations framework.

### **3.1 Work health and safety**

The objective of work health and safety (WHS) laws is to ‘secure the health and safety of workers and workplaces’ (model WHS Act, s. 3). They do this by imposing responsibilities on employers and employees. Most responsibility rests with the firm, but some obligations rest with employees. WHS law was developed in a context where most work was performed in premises controlled by the employer. Where more work is done in the employee’s home, the natural question arises as to whether the current distribution of responsibilities remains appropriate.

The Australian, State and Territory Governments have entered into an intergovernmental agreement to strive towards nationally uniform WHS legislation, and each enact their own WHS laws based on a model WHS Act developed by Safe Work Australia.

The model WHS Act provides for a broadly construed primary duty of care on any ‘person conducting a business or undertaking’ (PCBU) — a legal term encapsulating the firm itself and senior managers as its representatives. Among other things, PCBUs must ensure, as far as reasonably practicable:

- the health and safety of workers employed or directed by them
- that the health and safety of other people is not put at risk from work carried out for or by the firm
- the provision and maintenance of a work environment (including plant and structures; systems of work; facilities for workers’ welfare; information, training and supervision) without risks to health and safety
- that the health of workers and the conditions at the workplace are monitored to prevent illness or injury to workers (s. 19, SWA 2019).

The model WHS legislation also sets out responsibilities for workers. They must:

- take reasonable care for their own health and safety
- take reasonable care that their acts or omissions do not adversely affect other people’s health and safety

- comply (as far as they are reasonably able) with any reasonable instruction given by the PCBU to maintain the organisation's compliance with the WHS Act(s)
- cooperate with any reasonable policies or procedures the PCBU has in place relating to work health and safety (s. 28, SWA 2019).

The responsibilities of both firms and workers apply regardless of whether work is undertaken at a centralised workplace or another location, including at home — a 'workplace' is defined in the legislation as any place 'where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work' (s. 18, SWA 2019). However, home-based work arrangements can affect the nature and extent of workplace risks, and the risk-mitigation obligations of employers. These issues are discussed in the following sections.

## What sort of work health and safety risks arise when working from home?

Workers' homes are likely to encompass a variety of risks to work health and safety — some of which are similar to those in a centralised workplace (although they may be present to a different degree) and others that are more specific to a home environment. Key risks of working from home raised in media coverage, and in consultations for this project, included:

- musculoskeletal damage (often in someone's neck or back) arising from inappropriate or non-ergonomic workstation furniture, or, sometimes, being more sedentary (sitting down more and for longer periods of time) than when in a centralised workplace (Patten 2020)
- mental ill-health arising from social isolation (due to decreased face-to-face contact with co-workers) and/or blurred lines between work and leisure (which can be associated with a tendency to work longer hours, experience stress, and suffer burnout) (Eurofound and ILO 2017; SWA 2020)
- common household injuries arising from accidents, such as tripping and falling, or burning oneself on a hot surface.

Data on the actual harm incurred by workers as a result of workplace risks in the home is limited. Comcare data on workers' compensation claims show that compensation payments for injuries related to 'mental stress', 'body stressing' and 'falls, trips and slips' rose slightly in 2019-20 compared to the previous year (figure 3.1), but there is no evidence to indicate that this is a direct result of increased working from home.

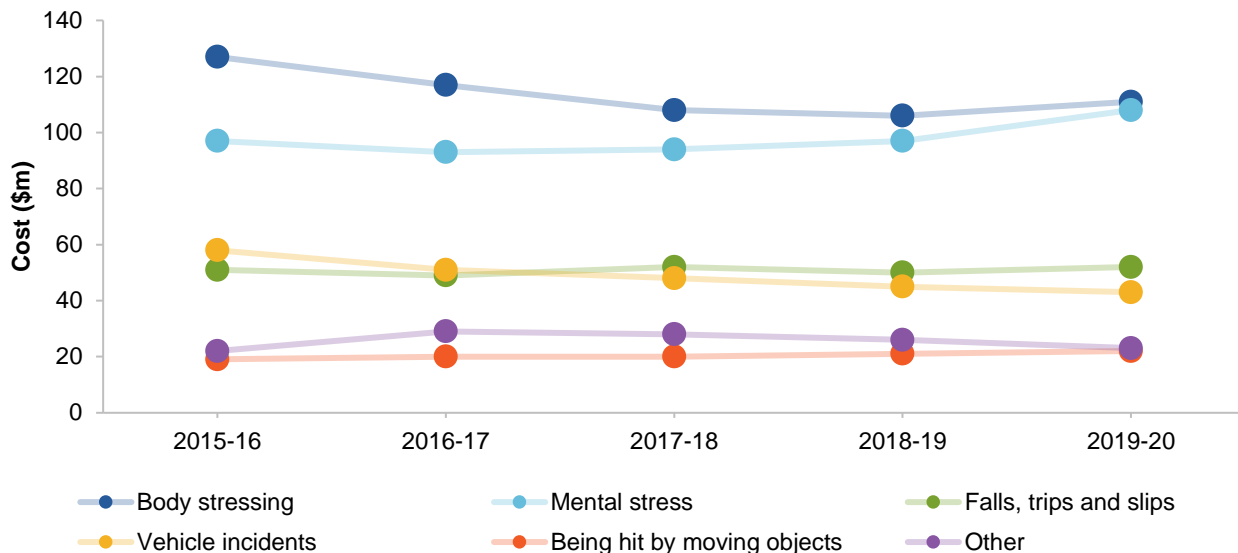
## Firms' duties to address risks 'so far as reasonably practicable'

Under section 17 of the model WHS Act, the primary duty to ensure health and safety includes a requirement for a PCBU to:

- eliminate risks to health and safety, so far as is reasonably practicable; and
- if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable.

What is 'reasonably practicable' differs from case to case, and involves weighing up a range of 'relevant' factors and making a judgement as to what is proportionate in each individual circumstance (box 3.1). Broadly speaking, however, home-based work introduces a greater level of complexity in determining what risks and risk mitigation are reasonable, given that employers generally have less visibility and control over home workspaces compared to centralised offices, and are therefore less able to correct risky environments or activities.

**Figure 3.1 – Comcare scheme workers’ compensation payouts by mechanism of injury**



Source: Comcare (2020, p. 16).

**Box 3.1 – What is ‘reasonably practicable’?**

The standard of ‘reasonably practicable’ has been generally accepted for some time as an appropriate qualifier of the duties of care in most Australian jurisdictions. This qualifier is well known and has been consistently defined and interpreted by the courts.

‘Reasonably practicable’ represents what can reasonably be done in the circumstances. Section 18 of the model Work Health and Safety Act provides meaning and guidance about what is ‘reasonably practicable’ when complying with duties to ensure health and safety. To determine what is (or was at a particular time) reasonably practicable in relation to managing risk, a person must take into account and weigh up ‘all relevant matters’, including:

- the likelihood of the relevant hazard or risk occurring
- the degree of harm that might result
- what the person knows or ought reasonably to know about the hazard or risk and the ways of eliminating or minimising the risk, and
- the availability and suitability of ways to eliminate or minimise the risk.

Only after taking into account these matters can the person consider the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Source: Safe Work Australia (2013).

During the COVID-19 pandemic (and the associated shift to widespread home-based work), Safe Work Australia released guidance on how employers could continue to fulfil their duties under WHS law (box 3.2). This guidance acknowledged that pandemic-related movement restrictions made it difficult for employers

(and their representatives) to physically inspect home workspaces, and suggested that employers undertake certain actions to ensure workers were aware of and equipped to address WHS issues that could arise while working from home.

### **Box 3.2 – Health and safety responsibilities in a pandemic: what do firms need to do when workers must work from home?**

In March 2020, Safe Work Australia (SWA) outlined some factors that firms and workers need to take into consideration to fulfil their duties under the WHS Act(s) in the context of broad, pandemic-induced work-from-home arrangements. Acknowledging that what firms could do to minimise risks at a worker's home may be different to what they could do at the usual workplace, SWA recommended that, in consultation with workers and representatives, firms should:

- provide guidance on safe home office environments, including what a good workstation setup looks like, why workers should not be sedentary all day and how to avoid this
- allow workers to borrow any necessary workstation equipment from the office to take to the home as agreed
- require workers to familiarise themselves and comply with good ergonomic practices, consistent with any workplace policies and procedures — for example, requiring workers to complete a workstation self-assessment checklist and provide their responses to the organisation
- maintain regular communication with workers
- provide access to information and support for mental health and wellbeing services
- appoint a contact person in the organisation who workers could talk to about any concerns related to working from home.

It also pointed out that firms must consider, and consult with workers on, how their *existing* policies and procedures apply when working from home, including:

- notification of incidents, injuries, hazards and changes in circumstances
- consultation and review of work health and safety processes, and
- attendance, timesheets, leave and other entitlements and arrangements.

SWA noted that, if necessary, firms could consult workers for an inspection of the worker's home work environment (through virtual means such as photos or video) to ensure it met health and safety requirements. In many cases (given the types of risks associated with the activities to be undertaken) an inspection would *not* be required. However, depending on the complexity of the potential risks involved, SWA suggested that organisations may need to engage the services of a health and safety professional to assess the risks to a worker working from home.

SWA reiterated that workers also have obligations to minimise risks to health and safety when working from home, including to:

- follow procedures about how work is performed
- use equipment provided by the workplace as per the instructions given, and ensure that equipment is not damaged or misused

### **Box 3.2 – Health and safety responsibilities in a pandemic: what do firms need to do when workers must work from home?**

- maintain a safe work environment, such as designated work area, moving furniture to ensure comfortable access, providing adequate lighting and ventilation, repairing any uneven surfaces or removing trip hazards
- manage their own in-house safety, such as maintaining electrical equipment and installing and maintaining smoke alarms
- notify the employer about risks or potential risks and hazards, and
- report any changes that may affect their health and safety when working from home.

Source: Safe Work Australia (2020).

In a post-pandemic world, movement limitations and work-from home requirements would not apply. Yet widespread home-based work raises difficult questions about the extent to which employers can — and should — have control over workers' homes (or the portions of them being used as workplaces). As noted by Safe Work Australia, 'control is an implied element in determining what is reasonably practicable' (SWA 2013, pp. 7–8), and is necessary in order to meaningfully hold employers to account for workplace safety.<sup>3</sup> But employees are likely to have concerns about giving employers control over parts of their homes, including in relation to privacy, autonomy and the cost of any required home modifications. As case law continues to evolve, striking a balance between the needs of employers and employees is essential in arriving at an interpretation of 'reasonably practicable' in a work-from-home context that is both meaningful and workable.

## **What responsibilities do firms have to address common household risks?**

One concern regarding home-based work is the extent to which employers are responsible for mitigating common household risks, such as tripping and falling. In blurring the lines between the home and the workplace, working from home also blurs what is within and beyond the scope of employers' responsibilities to eliminate and mitigate workplace risks.

The model WHS laws are relatively broad and principles-based, which enables the regulatory framework to respond to a wide range of different circumstances. However, this arguably creates uncertainty for firms with respect to what will be expected of them in discharging their duty of care. Whether or not employers are liable for injuries sustained at home is likely to turn on the facts of each case, including whether the employee was following a direction from their employer, and whether the injury occurred in the course of a 'normal' work day (Hannan 2020). Existing case law provides some examples of how these factors have been interpreted (box 3.3).

<sup>3</sup> That said, the role of control in determining employers' liability is not codified in the model WHS Act's explanation of 'reasonably practicable' (section 18) or in the duty to eliminate or minimise risks to health and safety (section 17). Only South Australia's WHS Act has explicitly includes control as an element of eliminating or minimising risks (s. 17(2), *Work Health and Safety Act 2012* (SA)).



### **Box 3.3 – Employers’ liabilities for injuries sustained at home: examples from case law**

#### ***Ziebarth v Simon Blackwood (Workers’ Compensation Regulator) [2015] QIRC 121***

In this case, the appellant (Robert Ziebarth) was employed as a fleet services manager at a transport depot. He had been given a work mobile phone for the purpose of carrying out duties while on call, and had previously been chastised by his superior for not answering his phone. One night while on call, Mr Ziebarth was taking a shower when heard the phone ring. He was anxious to answer the call before it went to message bank and hurried to do so. As he moved out of the shower, he slipped and fell forwards. The next morning, he suffered excruciating pain in his lower back and down his right leg. A later MRI showed that he had a disc protrusion that affected a nerve root, and early degeneration of a disc.

The Queensland Industrial Relations Commission (QIRC) found that the injury sustained by the appellant occurred in the course of his employment, since the activity of answering his work phone was one set out in his contract of employment, and in which his employer had ‘induced or encouraged’ him to engage. Further, the QIRC considered that his employment was a significant contributing factor to the injury.

The proximity of time between the fall in the bathroom and the onset of the pain, in the absence of any competing causal incident leads me to conclude, on the balance of probabilities, that the appellant’s employment was a significant contributing factor to his injury. [47]

The QIRC upheld the appeal, accepted the appellant’s application for compensation, and ordered the respondent to pay the appellant’s costs of and incidental to the appeal.

#### ***Demasi and Comcare (Compensation) [2016] AATA 644***

The applicant, Maryanne Demasi, was a producer and presenter of a television program employed by the Australian Broadcasting Corporation. Around 9.30am one day when working from home, she took a break and went out for a run. Partway through her run, she tripped on an uneven surface. She broke her right hip, which had to be surgically repaired, and claimed compensation on the basis that the injury arose in the course of her employment. Ms Demasi submitted that the break she took was indistinguishable from going for a run at lunchtime, and that the fact that it occurred at 9.30 am was irrelevant.

The Administrative Appeals Tribunal disagreed.

I would have thought it is beyond argument that going for a run during one’s lunch break is doing something ‘during an ordinary recess’ in one’s employment. But taking a break for the specific purpose of going for a run, at any random time of the day, is in a different category. It is not a recess of the kind contemplated by s 6(1)(b) of the [*Safety Rehabilitation and Compensation Act 1988*], much less an ‘ordinary’ one. I must therefore reject the submission made on her behalf, that her run at 9:30 in the morning is ‘indistinguishable’ from a run at lunchtime, on the basis that the lunchtime run is undertaken ‘during an ordinary recess’ in the worker’s employment, while the run taken on an ad hoc basis during the work day is not. [47]

## **Who is responsible for providing appropriate work equipment?**

Another issue related to WHS responsibilities concerns the provision of appropriate work equipment. In offices and other centralised workplaces, it is clearly the responsibility of employers to provide these items. However, where employees work from home, obligations are less clear. Relevant factors include whether

employees work partly or wholly from home, and whether they chose to work at home or were directed to by their employer. Arguably, workers who choose to work from home despite being provided with the necessary equipment at a centralised workplace have greater responsibility for providing their own equipment.<sup>4</sup> Conversely, employers who direct workers to work from home are likely to bear greater responsibility, although courts would also likely consider the practicality of requiring employers to provide two sets of equipment where work is conducted both at home and in a central workplace.

One decision by the Federal Court indicates that courts are likely to take a common-sense approach to these issues (box 3.4). In this case, although the worker had been directed to work from home as a result of government-imposed restrictions to manage the spread of COVID-19, the Fair Work Commission considered that the employee could have provided his own desk, given that his employer had provided all other necessary equipment.

### **Box 3.4 – Jayson McKean v Red Energy Pty Ltd [2020] FWC 5688**

In this case, the applicant, Jayson McKean, filed an unfair dismissal application in the Fair Work Commission (FWC) claiming that he was forced to resign from Red Energy (the respondent) because he had been directed to work from home without the provision of appropriate equipment.

The equipment in question was a desk. In July 2020, in response to the Victorian Government's stage 3 COVID-19 restrictions, Red Energy required all employees to work from home unless there was an urgent need to attend the office. Mr McKean, a 'customer assist specialist', had recently moved house and did not have a table or desk that allowed him to work from home. He continued to work from the office while seeking the company to provide him with a desk. When Mr McKean was informed by human resources that he must comply with the work-from-home direction, he submitted an application for six weeks' leave beginning the next business day, which was denied by Red Energy. He then resigned, later stating that the company's refusal to provide or pay for a desk, or to grant him leave or allow him to work from the office, and its failure to consider his personal circumstances, left him no reasonable choice but to resign.

The FWC found that Mr McKean's argument was entirely without merit, and that instead of resigning, he could have bought a desk. It noted that his refusal to do so was a position of principle — Mr McKean himself acknowledged that a desk could be purchased cheaply, and that he could have afforded to buy one. He has since bought a table. The FWC also considered that the materials the company had said it would provide to enable Mr McKean to work from home (a laptop, headset, adjustable chair, ergonomic assessments, access to an occupational therapist and online resources) were 'adequate resources', having regard to the nature of his work.

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<sup>4</sup> An exception to this is where workers have disabilities, in which case firms have legal obligations under the *Disability Discrimination Act 1992* (Cth) to make 'reasonable adjustments' to allow workers to comply with the requirements or conditions of their employment. Failing to do so, in circumstances where this is likely to disadvantage the worker with a disability, constitutes unlawful disability discrimination (s. 6(2); s. 15). An adjustment is 'reasonable' unless it would impose an 'unjustifiable hardship' on the firm (s. 4(1)).

In practice, the benefits of working from home to both employers and workers mean that it is likely that the two parties will seek to work constructively to arrive at mutually agreeable arrangements. If this does not eventuate, there may be a role for Safe Work Australia to provide further guidance based on case law and its understanding of legislation.

## Ensuring that workers can disconnect from work

For some people, working from home brings with it an increased risk of work impinging on non-working life. Blurring the lines between home and the workplace could also affect some employees' ability to 'switch off' from work. This in turn can have detrimental effects on stress levels, interpersonal relationships and work productivity, as well as presenting risks to mental health (and, sometimes, physical health) through experiences such as burnout.

In many cases, striking a balance between work and home life will require coordination between employers, managers, and employees. Firms may have to set clear expectations for managers and employees about when and how business communication should be conducted, and managers and employees will need to cooperate with each other to negotiate arrangements that are mutually beneficial. For their part, employees may need to be proactive in setting and maintaining boundaries between work and home life.

The model WHS Act's definition of 'health' includes 'psychological health', and the need for employers to address stress and burnout risks is well established in case law. Despite this, the increasing prevalence of working from home has led some to call for a 'right to disconnect' (box 3.5).

### Box 3.5 – What is a 'right to disconnect'?

The Australian Council of Trade Unions (ACTU) has proposed a 'Working from Home Charter' that sets out a range of rights and protections to which people working from home should have access (ACTU 2020a). The ACTU argued that the issue of work life bleeding into home life poses significant risks to wellbeing and equity, and suggests that there needs to be legal and reasonable limits on working time — including a 'right to disconnect' from work emails, telephone calls and other forms of contact outside of scheduled work hours (ACTU 2020b, pp. 7–9). (A corollary of this right is that workers must not be encouraged to be, or rewarded for being, constantly connected to work systems.)

A 'right to disconnect' has existed for some time in some overseas jurisdictions. For example, it has been embedded into the general French labour law since 2016. But the idea has only recently gained prominence in the Australian union movement (Ziffer 2021b, 2021a). The current enterprise agreement for Victoria Police, approved in March 2020, provides the following right to disconnect as a mandatory condition of employment.

59.1 Supervisors and managers must respect employees' periods of leave and rest days.

59.2 Other than in emergency situations or genuine welfare matters, employees must not be contacted outside of the employee's hours of work unless the employee is in receipt of an availability allowance pursuant to clause 56.

59.3 Employees are not required to read or respond to emails or phone calls outside their effective working hours. (FWC 2020b, p. 39)

### **Box 3.5 – What is a ‘right to disconnect’?**

While the right to disconnect did not emerge specifically from experiences of remote or hybrid work arrangements, it is particularly relevant to working from home because the idea of ‘finished for the day’ is harder to enforce. People who explicitly work in ‘on call’ arrangements are almost always paid an allowance based on the idea that their job at that time creates limitations on their full enjoyment of their home life and non-working time. A tendency for work hours to easily bleed into recreation hours when working from home creates a risk that the concept of differentiating between the two, and therefore being paid a premium for being on call, could slowly fade away in labour market practices. This would represent a transfer of welfare from workers to employers.

Given the relative clarity about this issue in WHS law, a ‘right to disconnect’ would only be needed as a preventative measure if evidence suggested that employees faced unreasonable pressure from their employers to remain ‘available’ despite existing protections. Workplace culture plays an important role in enabling employees to set appropriate boundaries and manage their wellbeing to avoid psychological injury. As discussed in chapter 2, the ongoing process of learning and adaptation will be an important means by which these risks are managed. Firms and workers will develop their understanding as to how to make working from home safer and more productive. Nevertheless, it will be important for regulators and workers compensation insurers to monitor whether increased working from home is associated with higher levels of workplace psychological injury.

## **WHS laws appear to be able to handle home workplace risks**

More widespread adoption of working from home will almost certainly change the breadth and profile of employers’ responsibilities. There are two main avenues via which home-based work has the potential to increase firms’ WHS costs:

- the need to conduct risk appraisal and mitigation over a large number of ‘workplaces’
- workers’ compensation premiums, as a result of the wider variety of risks and liabilities.

Some industry experts have stated that they expect such an increase in WHS costs to occur (Hannan 2020). However, there is no way to determine ahead of time whether these costs would increase materially (or in the case of workers compensation, at all). To the extent these costs did prove a significant burden, they could discourage firms from allowing working from home. This could close the door to arrangements that may otherwise be beneficial for workers and firms.

Equally, it is too early to assess whether increased work from home will increase the risk of some injuries, such as psychological injury through burnout. It will be particularly difficult in the coming years to distinguish any negative effects associated with voluntary working from home from those associated with mandated requirements for people to work from home during the pandemic.

Case law (noted earlier in this chapter) unpacks some of the duties of employers in addressing common household risks and supplying equipment for home workplaces. Although much remains unknown, there is little evidence to date that WHS laws are being applied in an unreasonable or unduly costly way. More issues will likely arise and be resolved as work from home becomes an entrenched part of the work environment, and as more case law emerges. Arguably any significant changes to WHS laws should await this evidence.

By agreement of the Ministers responsible for WHS, the model WHS laws are reviewed every five years (Boland 2018, p. 10). The next review is due in 2023. This review will provide an opportunity for governments to ensure that WHS laws are keeping pace with changing work practices, and that they are not being interpreted in ways that impede more widespread and sustained working from home.

## 3.2 The workplace relations framework

All developed economies regulate labour relations in some form. The precise structure of Australia's workplace relations system is unique — a function of economic, political, judicial and constitutional influences since before federation. It could be argued that Australia's workplace relations system has a number of purposes, including to protect vulnerable workers from exploitation through enshrined minimum conditions, to provide balanced bargaining power between firms and workers, to encourage employment, and to enhance productivity, including by facilitating mutually beneficial agreements between workers and firms.

To date, the formal workplace relations system has not played a significant role in regulating working-from-home arrangements. Assuming working from home becomes more prevalent in the future, it is unclear what role the workplace relations system will play in regulating it. Australia's workplace relations system is largely based on collective arrangements — legislation that applies to the whole community, awards that apply to an industry and collective agreements that apply to a workplace. By contrast, arrangements for working from home will, in many cases, be negotiated at the individual level, based on the circumstances of specific workers and roles. As a result, it is likely that individual workplace policy, as applied to specific individuals, will be the instrument that gives effect to the 'bargain' between firms and workers discussed in chapter 2.

The role of the formal elements of the workplace relations system — including the National Employment Standards in the *Fair Work Act 2009* (Cth), modern awards and enterprise agreements — is likely to be more limited, although it could shape work-from-home arrangements in some respects.

### Australia's workplace relations framework

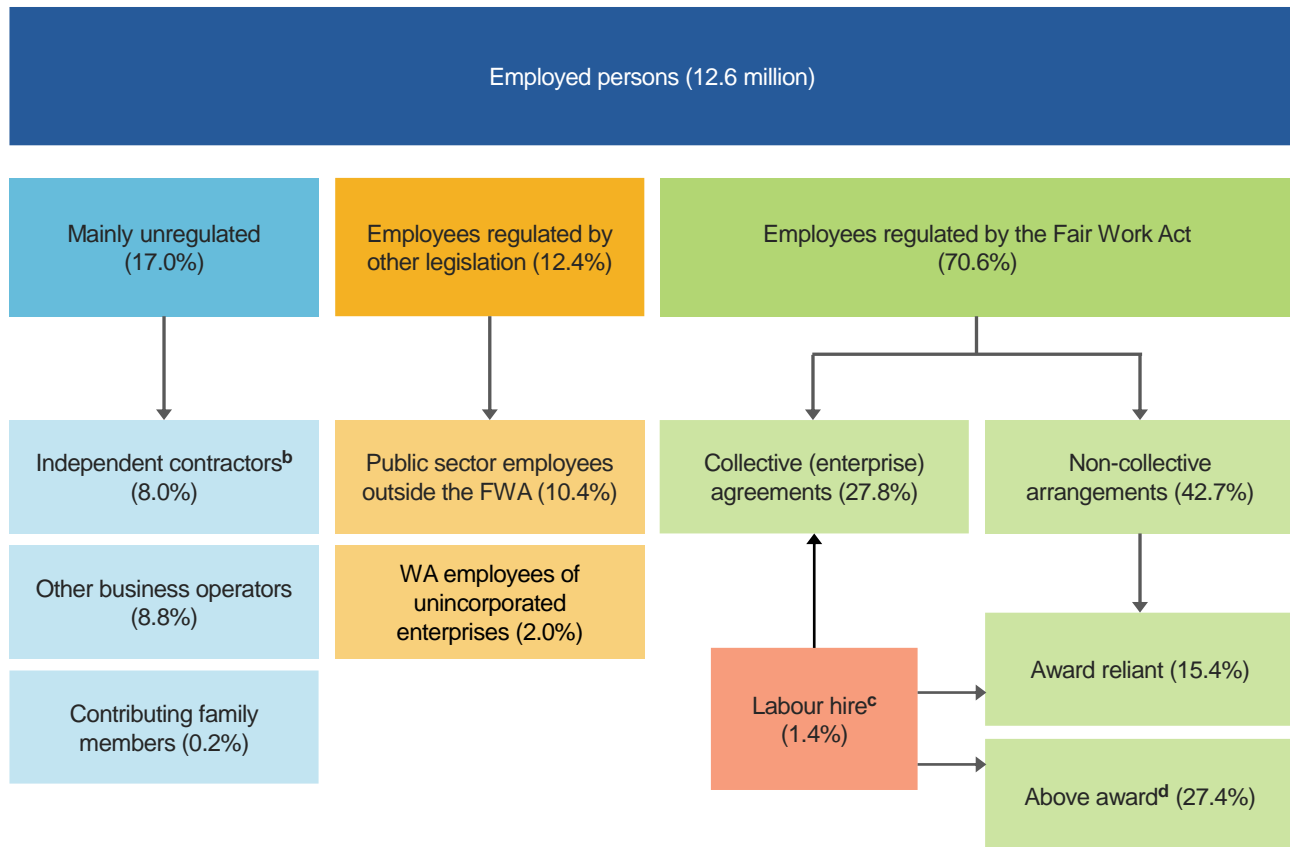
Across Australia, the workplace relations framework comprises a complex array of labour laws, regulations and institutions.

- The majority of employees are covered by the Fair Work Act (and the accompanying instruments that it authorises, such as modern awards). The Fair Work Act's coverage is often referred to as 'the national system'.
- The remainder are covered by other legislation (such as that covering state public sector employees in New South Wales, Queensland, South Australia and Western Australia), or are not subject to any labour relations regulation (figure 3.2).

Workers and employers in the national system have their workplace arrangements governed by a hierarchy of instruments. The National Employment Standards set out legislated, non-negotiable minimum conditions. Modern awards apply across the relevant industry and set out more detailed requirements for pay at various occupational levels and various conditions of work. Enterprise agreements can be made and formally registered if they pass the better off overall test compared with the relevant modern award.

Other details of workplace arrangements are set out in individual firms' policies or otherwise determined informally.

**Figure 3.2 – Employment arrangements**  
2018-19



a. Numbers may not add up due to rounding. b. Regulated by the *Independent Contractors Act 2006* (Cth). c. Excludes independent contractors. Employees under labour hire arrangements could have their pay set according to the award, above award or under a collective agreement. d. Not all this group would be covered by an award.

Source: ABS (*Characteristics of Employment, Australia, August 2018*, Cat. no. 6333.0; *Employee Earnings and Hours, Australia, May 2018*, Cat. no. 6306.0; *Employment and Earnings, Public Sector, Australia, 2017-18*, Cat. no. 6248.0.55.002; *Labour Force, Australia, Detailed – August 2018*, Cat. no. 6291.0.55.001), Department of Mines, Industry Regulation and Safety (WA) (pers. comm., 25 May 2021).

## Workers’ ability to request work-from-home arrangements

As noted above, the main instruments governing workers’ ability to work from home tend to be the policies enacted by individual firms. Nonetheless, various formal instruments set out the ability of workers to request work-from-home arrangements in certain circumstances.

### The Fair Work Act

Section 65 of Fair Work Act gives some employees a presumptive right to request changes in their working arrangements (such as hours, patterns or locations of work). Presumptive rights are afforded to those who have worked for their employer for at least 12 months — or, for casual employees, who work on a ‘long term, regular and systemic basis’ — and who:

- are parents (to children of school age or younger) or carers
- have a disability
- are aged 55 years or older
- are experiencing, or caring for someone experiencing, family violence.

The request to change working arrangements must be a consequence of these circumstances. Employers are only able to refuse requests on 'reasonable business grounds', which include, but are not limited to, that:

- the requested arrangements would be too costly for the employer
- there is no capacity to change other employees' working arrangements to accommodate the requested arrangements
- it would be impractical to change the working arrangements of other employees, or recruit new employees, to accommodate the requested arrangements
- the requested arrangements would result in a significant loss in efficiency or productivity
- the requested arrangements would have a significant negative impact on customer service.

Of course, the absence of a right to request does not preclude other workers from requesting a change in the location of their work — it simply means that firms are not legally obliged to consider or agree to such requests. And the provisions in the Fair Work Act are *minimum* standards — awards, enterprise agreements and workplace policies can, and do, provide for broader rights (discussed next). Even before the COVID-19 pandemic, many firms let employees make changes to their working arrangements above and beyond the requirements of the National Employment Standards, as doing so helped them to attract staff and enhance workplace morale (see, for example, Badenoch 2019; Keen 2016).

## Modern awards

Since 2018, all modern awards have contained a provision that expands on the right to request that is set out in the Fair Work Act. While the right to request remains limited to the same categories of people (parents, carers, people with a disability, people aged over 55 years, and people experiencing or caring for someone experiencing family violence), the provision requires employers to discuss the request with employees and to genuinely try to come to an agreement that reasonably accommodates the employee's circumstances.

For example, the *Social, Community, Home Care and Disability Services Industry Award 2010* states:

### 30A.2 Responding to the request

Before responding to a request made under s. 65 [of the Fair Work Act], the employer must discuss the request with the employee and genuinely try to reach agreement on a change in working arrangements that will reasonably accommodate the employee's circumstances having regard to:

- (a) the needs of the employee arising from their circumstances;
- (b) the consequences for the employee if changes in working arrangements are not made;
- (c) any reasonable business grounds for refusing the request.

The addition of this requirement to consult — and to genuinely try to reasonably accommodate an employee's circumstances — means that people with the right to request changes to their work arrangements have a strong basis on which to negotiate a working-from-home arrangement.

## Enterprise agreements

Enterprise agreements can also grant employees an expanded legal right to request (or take up) working-from-home and other flexible working arrangements. In the December quarter of 2019, about 350 enterprise agreements had provisions that enabled employees to perform some or all their work at home or at another site away from the office. While these agreements represented only about 3% of agreements, they covered just over 20% of employees (FWC 2020a).

Examples of current enterprise agreements that provide a right to request include:

- the Victoria Police (Police Officers, Protective Services Officers, Police Reservists And Police Recruits) Enterprise Agreement 2019, which replicates the expanded 'right to request' clauses inserted into modern awards in 2018 (section 14)
- the Amnesty International Australia Employment Agreement 2021, which provides that requests to work from home by any employee will not be unreasonably refused as long as Amnesty International Australia is satisfied that a number of conditions relating to operational needs, health and safety standards and the security of information and files will be met.

Some State public sector enterprise agreements also include conditions relevant to changing the location of work. For example, in South Australia, section 13 of the *Modern Public Sector Enterprise Agreement: Salaried 2017* provides for voluntary flexible working arrangements, and requires that agencies promote and improve awareness of these arrangements within the public sector (South Australian Employment Tribunal 2018).

## Workplace policies

Workplace policies — statements that outline how firms approach human resource management, standard operating procedures or expectations of employee behaviours and performance — are the primary mechanism by which work-from-home arrangements for most employees are determined. They offer a relatively easy and flexible way for employers to set broader parameters for working from home. They are quicker and less costly to introduce or amend than enterprise agreements, and can be designed to meet employers' and employees' unique needs. But they do not provide enforceable rights — they are ultimately at the discretion of the firm and can be changed easily.

Many employers have flexible work policies, which often include provisions about changes to the location of work. These include company-wide hybrid work policies and 'work from anywhere' policies. Over recent years many large firms have made all roles flexible by default, including Telstra (which has had an 'all roles flex' policy in all of its business units since 2014) (Telstra 2014), banks such as ANZ and Westpac, and consulting firms such as PwC (Smith 2015). The Workplace Gender Equality Agency estimated in 2020 that about 76% of private sector employers had a flexible working arrangements policy or strategy in place (WGEA 2021).

Workplace policies that support employees' ability to work from home are also increasingly common in the public sector. For example, the NSW Government introduced a 'policy commitment' in 2016, stating that all public sector employees would be entitled to access flexible working arrangements, unless it would be genuinely incompatible with their role (an 'if not, why not?' approach) (NSWPSC 2017). And in March 2021, the Victorian Public Sector Commission launched a new *Flexible Work Policy*, which applies to all Victorian Public Service employees. It states that:

Flexible work is available to you by default, regardless of:

- the reason you want it
- when you started your employment
- your role.

All roles can have some type of flexibility.

But not all types of flexibility will work for every role.

If there's a good reason a role can't have a type of flexibility, managers and employees must look for a type of flexibility that will work. (VPSC 2021, p. 7)



## Other legislation and awards

Some legislation and awards outside of the national system also gives workers rights to request work-from-home arrangements. For example:

- Queensland's Industrial Relations Act 2016 (sections 27-29) provides employees with a general presumptive right to request flexible working arrangements, with employers only able to refuse those requests (or place conditions on them) on 'reasonable grounds'
- in Victoria, section 19 of the Equal Opportunity Act 2010 requires employers not to unreasonably refuse to accommodate an employee's parental or caring responsibilities. The assessment of what is unreasonable should weigh up factors such as the nature of the business, the employee's role, what arrangements the employee has requested, and how this would fit with their role. There is no requirement for at least 12 months' service (or 'long term, regular and systematic' casual work)
- the Tasmanian State Service Award 2020 provides in Part V(2) that employees' requests for 'work-life balance arrangements', including in respect of where work is performed, will not be 'unreasonably refused'.

## Ensuring that the workplace relations system keeps pace with changing norms and practices

As noted in chapters 1 and 2, the pandemic-induced shift to widespread work from home has prompted changes to work norms, with people now preferring to work from home more often, and over 75 per cent of managers believing that their staff would continue to do so going forward (Baird and Dinale 2020; Hopkins and Bardoel 2020). Directions by governments to work from home due to the pandemic have 'accelerated what had been an emerging feature of contemporary working arrangements in some occupations and industries' (FWC 2020a, p. 6).

The award system is adapting to these changing norms, and changes have been made to remove potential barriers to the uptake of work-from-home arrangements. These include both temporary award variations during the COVID-19 pandemic, and flexibility provisions that can be incorporated into awards with a view to informing longer-term changes.

### Award variations during the COVID-19 pandemic

In April 2020, in response to the COVID-19 pandemic, the Fair Work Commission (FWC) made determinations inserting a temporary new Schedule X into 99 modern awards, which provided two weeks of unpaid pandemic leave, and enabled employees to take twice their annual leave at half their normal pay if their employer agreed. The temporary variations apply until 31 December 2021 (FWO 2021).

In addition, a number of awards were varied further to allow employers flexibility in managing the pandemic.<sup>5</sup> Variations commonly included provisions that allowed employers to direct workers to perform any duties within their skill and competency regardless of classification (subject to some protections for workers), and to direct or request workers to take paid annual leave. None of these variations changed workers' rights to request working-from-home arrangements, and many have since expired.

<sup>5</sup> Award-specific COVID-19-related schedules were added to the *Aged Care Award 2010*, *Clerks — Private Sector Award 2020*, *Educational Service (Schools) General Staff Award 2020*, *Fast Food Industry Award 2010*, *Health Professionals and Support Services Award 2020*, *Hospitality Industry (General) Award 2010*, *Nurses Award 2010*, *Real Estate Industry Award 2020*, *Restaurant Industry Award 2010* and *Vehicle Repair, Services and Retail Award 2020*.

One of the awards varied which has relevance to discussions about working from home was the *Clerks — Private Sector Award 2020* (the Clerks Award). Among other things, the variation facilitated flexible working-from-home arrangements through:

- an extension in the span of 'ordinary hours' for employees working remotely
- allowing remote workers to work their hours in a non-continuous manner
- allowing part-time employees to select their own starting and finishing times when working remotely, with agreement from their employer
- allowing flexibility in the timing of meal or rest breaks when working remotely, subject to employers' agreement.

The variation to the Clerks Award was initially set to expire on 30 June 2020, although it was subsequently extended four times and ultimately expired on 30 June 2021.

At an October 2020 hearing concerning the second extension application, the FWC stated that there was a need to consider more permanently varying the Clerks Award, given that widespread working from home was likely to be an enduring trend. It directed the Australian Services Union, Australian Council of Trade Unions, Australian Industry Group and Australian Chamber of Commerce and Industry to explore this matter, and held several conferences. However, it discontinued the case in April 2021 at the request of the parties, who stated that they did not view the changes as necessary and would continue monitoring relevant developments and engage with the FWC in the future if required ([2021] FWCFB 3653).

Although the variation to Clerks Award was not made permanent, it provides an example of how awards could be varied in the future to facilitate working-from-home arrangements. As Justice Ross noted, most modern awards do not expressly deal with issues related to work-from-home arrangements (FWC 2020). This can create barriers — for example, employers may have to pay overtime or penalty payments where employees seek additional flexibility to meet their preferences. The variation to the Clerks Award addressed these issues, thereby removing potential barriers to the uptake of work-from-home arrangements.

## **Award Flexibility Schedule**

Informed by the experience of the awards variations during the COVID-19 pandemic, in August 2020 the FWC released a draft Award Flexibility Schedule (FWC 2020). It expressly deals with working-from-home arrangements. Among other things, it contains provisions that would allow employees to request:

- to compress their working week so that their usual weekly ordinary hours are worked over a reduced number of their usual work days
- a change to their usual times of work when working from home, such that the span of 'ordinary hours' can be extended to include earlier and later times, if agreed with their employer.

Such provisions aim to facilitate arrangements which support flexibility and work–life balance. This aim aligns with previous research that suggested that in order to be effective, work–life balance policies must be integrated into everyday work practices rather than being treated as issues of special consideration for a certain group of workers (Skinner, Pocock and Hutchinson 2015). The Award Flexibility Schedule is intended to be used as a starting point for discussion about how best to achieve this integration — not all of the clauses proposed in the schedule will be suitable for all awards and some will require tailoring to meet the needs of a particular industry or occupation.

Parties wishing to include the flexibility schedule within awards (with or without variations) have been invited to make applications to the FWC. The schedule is intended to operate for 12 months from its inclusion in any modern award, after which time it will be reviewed. This will provide governments, employers and employees

with more real-life information about how flexibility in hours and location of work can be adopted in practice, and about any further systemic changes that may be required.

However, as with the National Employment Standards and the provisions of modern awards, these provisions focus on the ability of workers to request flexibilities in the context of working from home. They do not provide a substantive entitlement for an employee to work from home. Such a provision would be blunt, costly and contrary to the spirit of experimentation discussed in chapter 2.

## Can employers require employees to work from home?

As noted above, while some might see the role of the workplace relations system as facilitating more work from home, others might be more concerned to protect workers from being forced to do so. Given the survey evidence so far indicates that more firms than workers prefer a *fully* remote model of work, a question arises as to whether firms have the ability to direct employees to work from home (if, for example, they did not wish to continue incurring the costs of maintaining a centralised workplace). The Fair Work Act does not make any explicit references as to whether firms have this right.<sup>6</sup>

In most cases, a direction to work from home would likely be permissible as a ‘lawful and reasonable direction’ pursuant to common law (Morgan and Hogan 2020).<sup>7</sup> That said, the majority of employees covered by the national system are afforded some protection through instruments that require employers to consult employees about major workplace changes (box 3.6). And employers will continue to have partial responsibility for employees’ health and safety while they work at home (section 3.1).

### Box 3.6 – The requirement to consult on major changes

The majority of employees covered by the national system are employed under instruments that include a requirement for employers to consult employees about major workplace changes. These include all enterprise agreements (as mandated by section 205 of the *Fair Work Act 2009* (Cth)) and all modern awards (which include a standard provision on consultation).

- The modern award provision is more restricted — applying to circumstances in which ‘an employer makes a *definite* decision to make major changes in production, program, organisation, structure or technology that are likely to have significant effects on employees’ — but does specify that ‘significant effects’ includes the need for employees to be transferred to other locations.
- The requirements for enterprise agreement consultation terms in section 205 of the Fair Work Act are more general, stating only that employers must consult employees about ‘a major workplace change that is likely to have a significant effect on the employees’. There is no stated need for the change to already be definite. If, however, an enterprise agreement fails to include a consultation term, a ‘model consultation term’ (identical to the provisions inserted in all modern awards, described above, and including the phrase ‘definite decision’) will be imputed.

<sup>6</sup> The only explicit prohibition on firms unilaterally requiring someone to work from home is found in the WA Government’s *Public Sector CSA Agreement 2019* (section 52.4(d)).

<sup>7</sup> An exception would arise if a worker demonstrated that their home was not a safe place to work, which would render the direction unlawful per the model work health and safety laws (discussed in more detail above).

While the formal workplace relations system provides for some procedural rights — such as the requirement to consult on major changes — it provides little in terms of substantive entitlements regarding work from home. This means that most of the negotiations between employers and employees regarding work from home will remain outside the formal workplace relations system. The emphasis on procedural rights in formal workplace relations means that employers are not obliged to offer either work from home or access to a common workplace. Mandating that firms do either or both of these would be costly, inefficient, and would likely stymie the uptake of new technologies and ways of working.

## 4. How will increased working from home affect cities?

### Key points

- ✳ **An increase in the amount of work done from home has the potential to shift some economic activity away from the centre of cities.**
  - Some businesses that require high foot-traffic in order to be viable — such as cafes and hairdressers — may choose to locate in suburbs rather than in city centres.
  - The movement of people and businesses away from the centre of cities may reduce agglomeration benefits experienced by businesses in cities.
- ✳ **Cities are complex systems made up of many people and businesses, where economic changes are absorbed across multiple dimensions. This process of change and adaptation will mitigate the initial effects of an increase in working from home.**
  - A decline in office rents will likely limit the overall exit of firms from the centre of cities, as well as attract new businesses to locate closer to the central business district (CBD).
  - The benefits of businesses working in close proximity — sharing, matching and learning — remain strongest in high density areas like CBDs.
  - Many firms will experiment with hybrid or work-from-anywhere models, and will maintain their CBD offices because of their accessibility.
- ✳ **City populations could become more dispersed, with some households that work from home commuting less often and moving further away from city centres.**
  - More working from home is expected to increase demand for larger housing, which may also provide an impetus for people to move further out.
  - However, the widespread uptake of hybrid approaches to working from home will continue to tether workers to cities.
- ✳ **Increased working from home is unlikely to decrease congestion without the support of other policies such as road pricing. Even with more people working from home, congestion may worsen if people who used public transport prior to the pandemic begin driving.**

Working from home represents a significant and rapid change to the economy, and has the potential to affect the location of economic activity and the shape of Australian cities.

Cities are hubs of economic and social activity. They form as the result of a complex and interactive process of decision making by individuals and firms, and reflect the gains that come from clustering.

Modern Australian cities have seen significant changes in recent decades. They have been shaped in part by the relative decline of manufacturing and the shift towards knowledge-based services. The advantages of knowledge spillovers within and between businesses have meant that knowledge-based businesses have been willing to pay high prices to locate centrally. Conversely, businesses that deliver goods and services directly to customers, such as retail outlets, have found it more rewarding to locate closer to where people live, such as large suburban shopping centres.

An increase in the number of people working from home is likely to see increased demand for services that require face-to-face interaction in suburban areas. This implies that business closures in city centres will be accompanied by the creation of new businesses in suburban areas — or the relocation of existing businesses. Some households may consider moving away from the city if they do not have to commute as frequently, although other benefits associated with city living make this less viable for many people.

Speculation that working from home heralds the end of cities<sup>8</sup> has little basis. At the moment, it is not possible to distinguish between the effects of the COVID-19 pandemic and an increase in working from home due to choice. While both the pandemic and changes in work practices may provide some impetus for economic activity to move away from the centre of cities, it is the increase in working from home that is expected to persist. Countering any long-term pull away from cities are the enduring benefits that come from being located close to others. Agglomeration benefits — the economic benefits that are generated when many people and businesses cluster together — are likely to remain a strong incentive for businesses to locate in cities and for people to live close to city centres.

## The economics of cities

The vast majority of Australians live in major cities. In 2020, approximately 65% of Australia's population resided in its eight capital cities, with 39% living in either Sydney or Melbourne (ABS 2021).

Cities exist because people can benefit from proximity. When many businesses are located closely together, such as in city centres or urban industrial areas, they benefit from, among other things, lower transportation costs (Audretsch and Dohse 2007; Krugman 1991b). The economic benefits associated with proximity are called agglomeration benefits. Agglomeration benefits can be described as the lower costs of moving inputs ('sharing'), moving people ('matching'), and moving knowledge ('learning') when businesses and employees are located closely together (Ellison, Glaeser and Kerr 2010; Marshall 1890, box 4.1).

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<sup>8</sup> For example, Thompson (2021) argued that the work-from-home experience during the pandemic of 2020 portends a vision of a 'nowhere-everywhere future of work', where the 'city in the cloud essentially acts as a more accessible version of the city on the Earth, eerily reproducing its forces of agglomeration, specialization, and convenience'.

### Box 4.1 – What is agglomeration?

Agglomeration economics focusses on the benefits that come from close physical proximity between economic agents. The benefits of agglomeration can be broken down into three areas: sharing, matching and learning (Bolter and Robey 2020).

**Sharing** refers to the benefits gained from sharing inputs to production, such as infrastructure, facilities, suppliers, and workers (Giuliano, Kang and Yuan 2019). An example of this might be Melbourne wholesalers locating close to the Port of Melbourne, or businesses taking advantage of existing internet infrastructure (faster internet) in central business districts. People may also like to share amenities that are only available when many people cluster (such as a football stadium).

**Matching**, also called labour pooling, refers to the benefits of efficiently pairing workers with firms when they are in close proximity. Close proximity to multiple firms allows employees to ‘job hop’ and learn about the advantages and disadvantages of individual firms. This process of job-hopping can help workers efficiently sort themselves into industries where they will be more productive, as well as allowing flexible movement between jobs after a productivity shock (Glaeser 2010).

**Learning** refers to the knowledge spillovers that occur with face-to-face interaction. This ranges from the diffusion of existing practices to the spread of new ideas and the potential for innovation. This can occur at the intra-firm level, with employees learning from and collaborating with each other, as well as at the inter-firm level, with employees creating local networks. Although some learning is intentional, much is also the result of ‘serendipitous random encounters’ (Giuliano, Kang and Yuan 2019, p. 380).

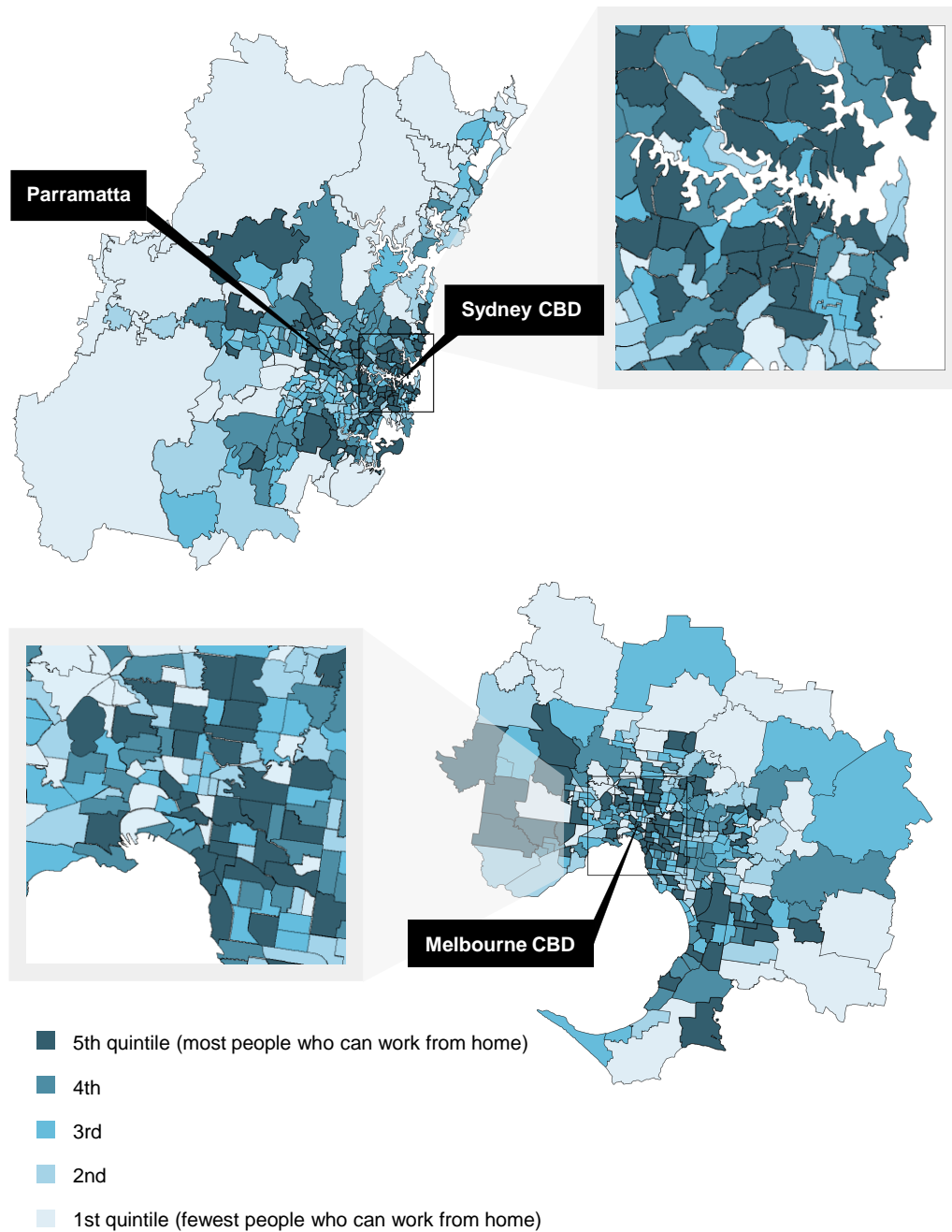
The lower costs of moving things between places and the serendipitous transmission of ideas are two of the major benefits of cities (Glaeser 2008; Krugman 1991a). Both of these advantages come from high population density. These benefits flow to many parts of the economy, even improving the productivity of investment (Moretti 2019). These agglomeration benefits not only mean that businesses locate closer to city centres, but also that households are more likely to be located in cities than in regional areas (PC 2014). High population density also allows people to share indivisible goods which would not otherwise exist, like large-scale sporting facilities, libraries and zoos (Duranton and Puga 2004).

The introduction of digital technologies gave rise to the argument that physical proximity would become less of a driver for economic activity and that cities would become less important (Hall 2003). This has not happened — rather, economic activity has become more concentrated in cities since digital technologies have become commonplace (Sassen 2001, 2013).

## Working from home is a CBD-centric shock

Central business districts (CBDs) have the highest population density and concentration of economic activity in cities (Ramani and Bloom 2021). There is a high concentration of jobs that can be done from home — predominantly knowledge-worker jobs — concentrated in Australian CBDs (PwC 2021), with most people who can potentially do their job from home typically living close to the centre of cities (figure 4.1). This chapter looks at how increased working from home is likely to change CBDs.

**Figure 4.1 – Most people who can work from home live close to the centre of cities<sup>a,b</sup>**  
**People who can potentially work from home by place of usual residence, 2016**



**a.** Areas are categorised in quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2). **b.** See appendix C for other capital cities.

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).



## 4.1 Working from home will spread out economic activity

### A change in where people work could change where businesses choose to locate ...

A sustained increase in the level of working from home will change the working location of city populations. People who once commuted into city centres and other urban business hubs will now be located — at least some of the time — in suburban areas while they work. Using estimates of the jobs that can potentially be done from home, figure 4.2 shows the geographic areas that are likely to experience the greatest increase in daytime population when people work from home more. There is a clear loss of people from the centre of cities and a gain in the inner suburbs of Sydney and Melbourne. Appendix C contains maps showing the potential for change in other capital cities.

This analysis shows the possible changes in where people might work, rather than being a prediction of change. Depending on its size, this initial effect would likely have second-round effects on businesses, as they react to the changes in the location of people and economic activity during business hours. There are two kinds of businesses that will be affected by this shift in the location of workers:

- businesses that service customers who can work from home
- businesses that employ people who can work from home.

The first type of business includes retail outlets (for example, clothing stores and book stores), hospitality venues (such as restaurants and cafes), health services (for example, general practitioners and dentists), and hairdressers. These businesses require being located close to their clients, and so will tend to cluster wherever populations cluster (Doling and Arundel 2020).

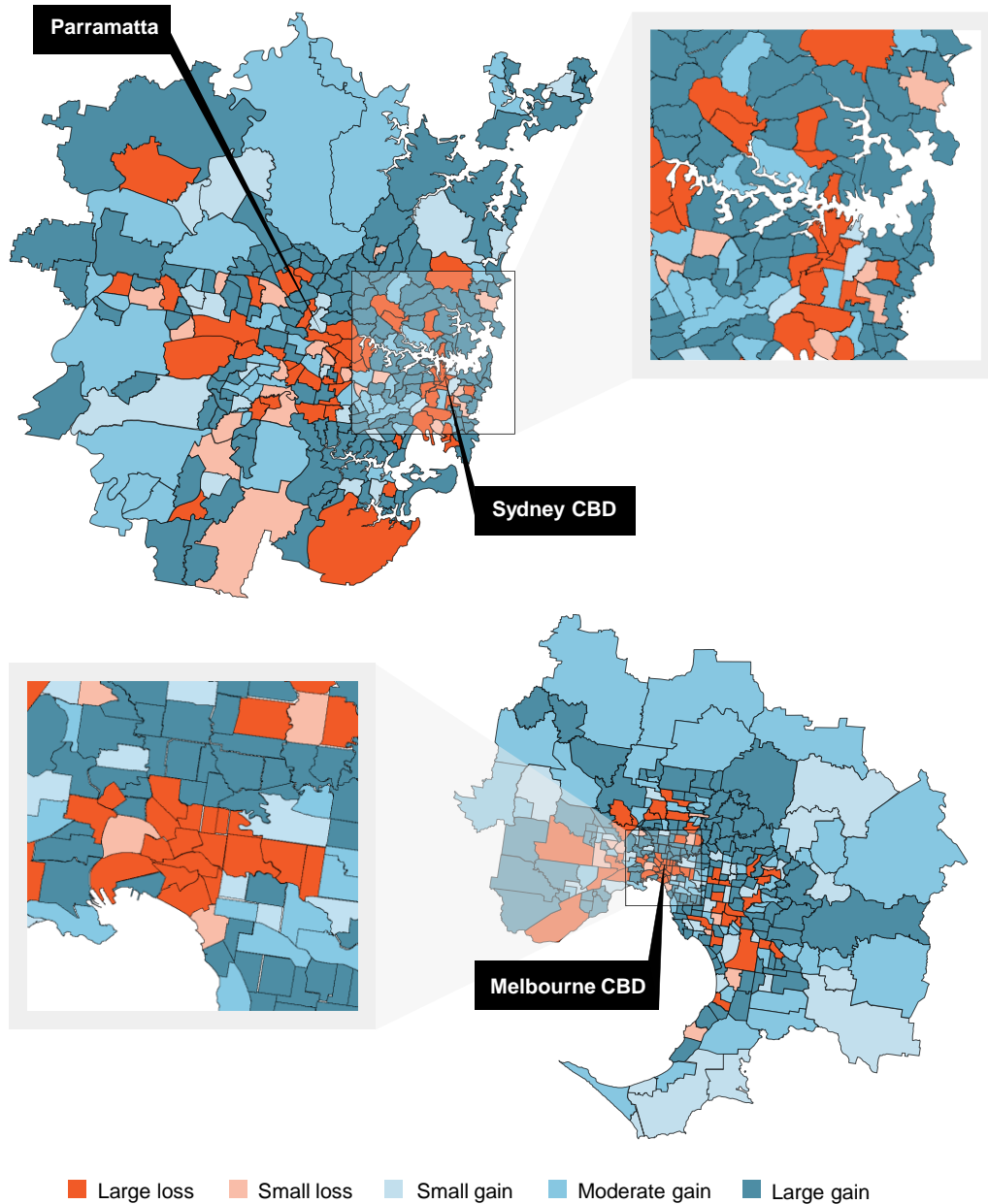
As more people begin to work from home, businesses that have relied on commuters spending money in CBDs will face lower demand. This creates potential for some business activity to move away from city centres in search of the more spatially diffuse market for goods and services.

Ramani and Bloom (2021) have found evidence of a 'donut effect' in US cities where increased working from home is associated with declines in commercial office occupancy rates. This could also happen in Australian cities if an increase in working from home shifts demand for commercial property away from city centres as businesses follow households out to the suburbs. But the majority of people who can work from home appear to be clustered close to city centres in Australia (figure 4.1), suggesting that any outward movement of economic activity is likely to be limited.

The second type of businesses are largely those that employ knowledge workers and can consider the possibility of shedding the office altogether (chapter 2). These businesses could also choose to locate away from city centres, but face a range of competing considerations that will affect this decision (discussed below).

**Figure 4.2 – Working from home shifts people from CBDs to the inner suburbs<sup>a,b</sup>**

**Change in SA2 population if people who can work from home do work from home, 2016**



**a.** The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2). **b.** See appendix C for other capital cities.

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

## ... but countervailing forces mean city centres remain attractive for businesses

The benefits of agglomeration will still attract businesses to cities, even if these benefits are diminished. Working from home has the potential to change the benefits of agglomeration in two main ways: by decreasing population density and by changing how some benefits are accessed (table 4.1).

**Table 4.1 – How increased working from home affects the benefits of agglomeration**

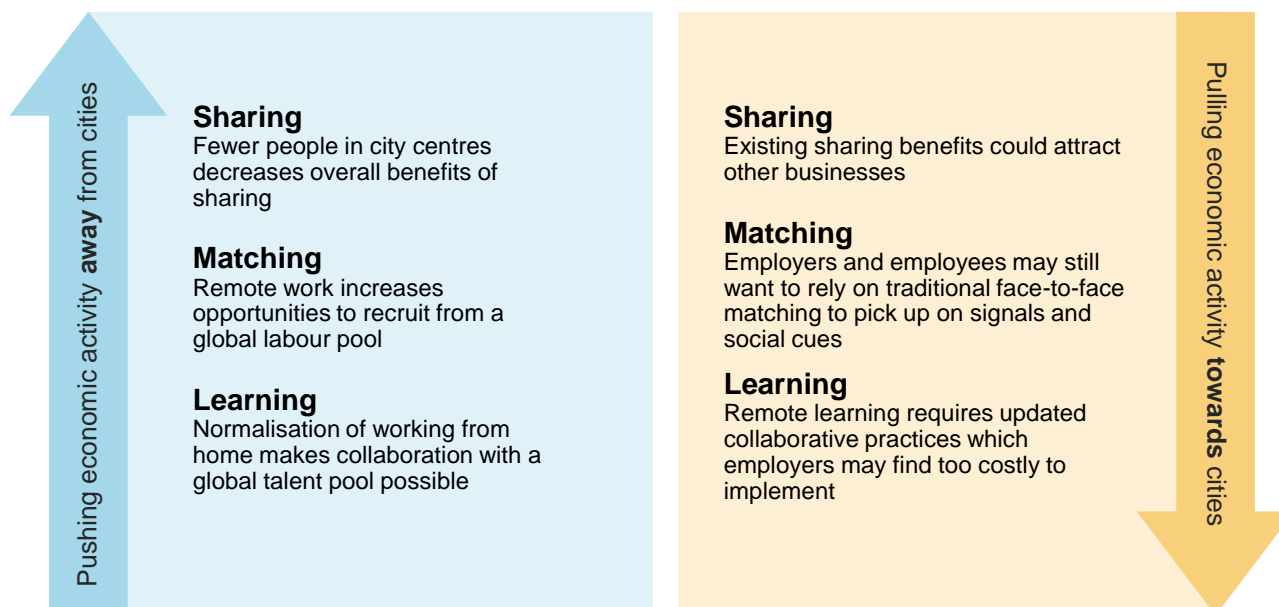
Benefit of agglomeration	Effects of decreased population density	Effects of changed access to agglomeration benefits
<b>Sharing</b>	As face-to-face businesses move away from city centres and some businesses go partly or fully remote, the benefits of sharing for those businesses that remain will be lower.	Working from home reduces some benefits of shared infrastructure.
<b>Matching</b>	Fewer serendipitous exchanges with co-workers make it less likely employees will learn about vacancies.	Matching made less costly because employees can match with businesses without geographical restrictions.  <b>However</b> , employers and employees may still rely on informal networks and face-to-face methods of matching.
<b>Learning</b>	Lower density of workers makes serendipitous exchange of knowledge less likely, so learning is more costly.	Working from home normalises online collaboration, making remote learning and sharing of information possible.  <b>However</b> , work culture may mean that people continue to rely on spontaneous interaction for the exchange of knowledge, which is decreased with remote work.

Working from home could lessen the benefits of agglomeration by creating lower population density in CBDs. This would mean fewer people to share with, fewer people to match with, and fewer people to learn from. For example, a reduction in people commuting into city centres means there are fewer people to share transportation services, which makes it more costly to operate public transport services.

Increased working from home will also change the way some agglomeration benefits are accessed. Matching is less costly when the size of the remote workforce increases. Working from home allows companies to access the global talent pool and decreases the need to have centralised workplaces. GitLab (2021), a technology company with a remote workforce of over 1300 workers around the world, cited the ability to access a global pool of highly motivated and talented workers as their principal reason for being ‘all remote’.

But the increased matching benefits of remote work are likely to be accompanied by an increased difficulty of generating knowledge spillovers between remote workers. The importance of learning in the knowledge industry may mean that a centralised office remains preferable for many businesses. Although knowledge spillovers may be achieved by a remote workforce through technological and cultural changes, it is likely that the cost of this adjustment will mean many businesses prefer to remain in city centres — where knowledge spillovers are maximised. These trade-offs lead to a push and pull of cities on businesses and people (figure 4.3).

**Figure 4.3 – Push and pull on economic activity in cities**  
**The effects of working from home on density in cities**



**Adjustment in commercial rents and suburban and regional land values will be a part of any transition**

More people working from home could reduce demand for central office space, though to what extent is hard to predict. Where demand does fall, price adjustments often work to mitigate these effects. For example, a shift in economic activity away from city centres would reduce the relative cost of locating a business there. Similarly, increased housing demand could drive up land values further away from cities (Delventhal, Kwon and Parkhomenko 2021). The longer-term adjustments in commercial rents could limit any overall fall in demand for office space in the city centres (box 4.2). Indeed, some new businesses might viably locate in city centres when it was previously too costly (Davis, Ghent and Gregory 2021).

- Australian modelling by Lennox (2020) found that, when working from home becomes more common, there are still agglomeration benefits of being located in the city and declining commercial rents make it cheaper to access them.
- Delventhal, Kwon and Parkhomenko (2021) similarly found that, once businesses can access labour remotely, the lowest-cost place to locate is in CBDs, to gain the remaining benefits of agglomeration. For businesses that maintain offices and require some in-person attendance — such as those employing a hybrid model — being located in city centres provides distantly-located employees with ease of access by public transport.

There is some evidence that vacancy rates for commercial real estate in CBDs are increasing (figure 4.4), reflecting declining demand for commercial real estate. While there are likely several pandemic-related factors contributing to the decline in demand, increased vacancies could also reflect the early signs of employers downsizing or closing offices in response to increased work from home.

### Box 4.2 – Rents and the market for commercial real estate

How many offices remain unoccupied depends on the price elasticity of the supply of office space. Decreased demand for office space suggests rental rates will begin to fall because the supply of commercial real estate in CBDs is relatively inelastic in the short run. In a survey of 42 US metropolitan areas, Tong and Marcato (2016) found that all the commercial real estate markets in those areas were supply inelastic because of the time and regulatory cost incurred to build or repurpose office buildings.

Consider the hypothetical examples below, where  $r$  denotes the cost of rental space and  $Q$  denotes workers per square metre of rental space. If the supply of office space (considering owners do not specify number of workers, but only square metres in contracts) is perfectly inelastic (figure 1), then a decrease in demand (from  $D$  to  $D'$ ) means that offices sit empty or rents fall until offices are leased at pre-pandemic occupancy levels. If, on the other hand, the supply of office space is only relatively inelastic (figure 2) then both rents and the amount of office space occupied will both fall to below pre-pandemic levels.

Figure 1: Perfectly inelastic supply

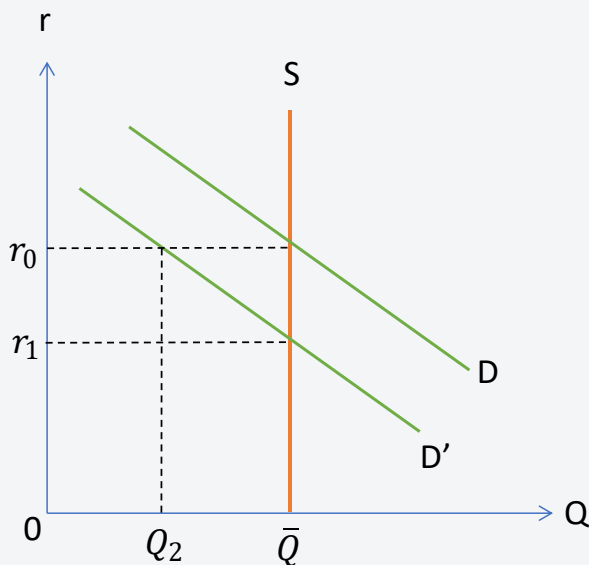
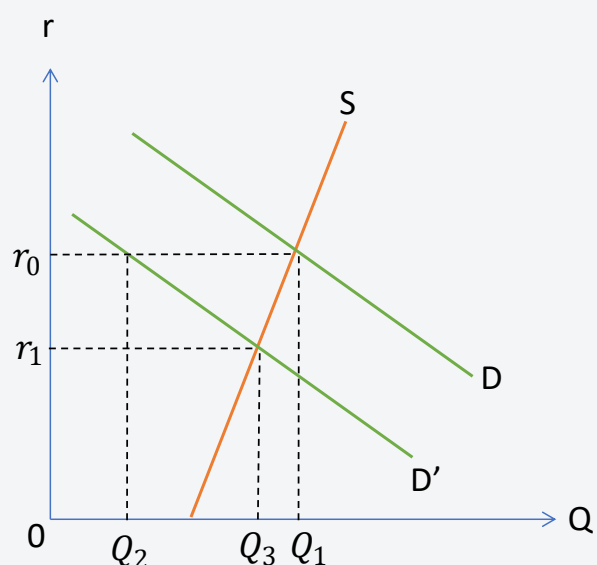


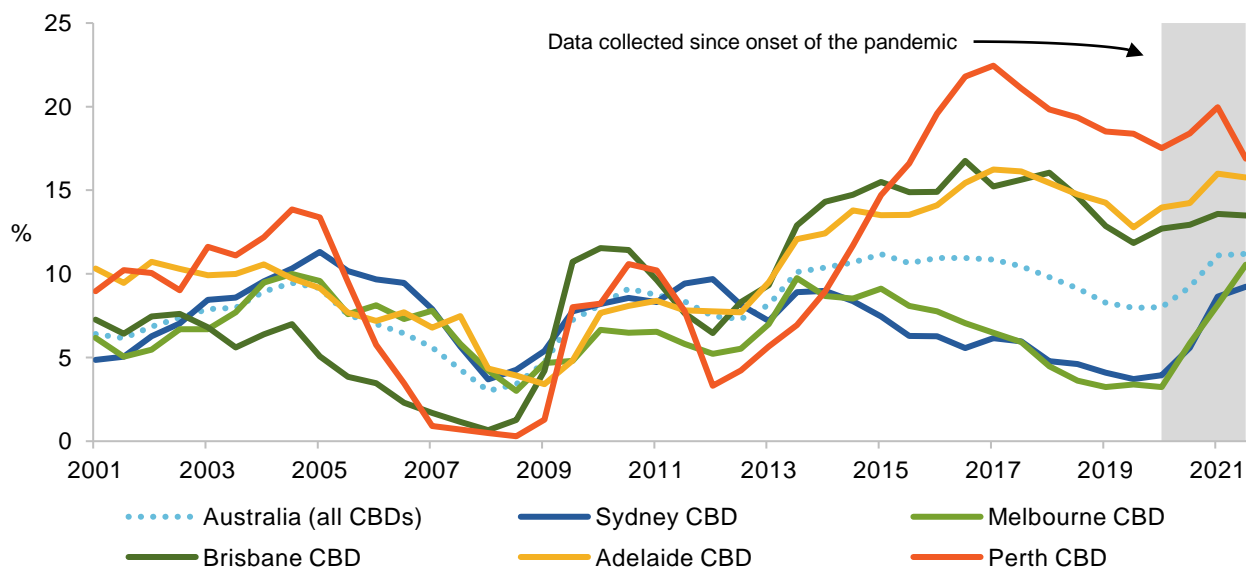
Figure 2: Inelastic supply



In the short run, rents are sticky because commercial office space leases typically last for 5–10 years. This means that following a negative demand shock rents will take time to adjust (that is, the rental rate  $r$  is fixed at  $r_0$  in the short run) and a negative shock will result in fewer people in offices in the short run (shown as a decrease in the quantity traded from  $\bar{Q}$  to  $Q_2$ ). The low opportunity cost of commercial office space (due to the high adjustment costs of repurposing office space for other uses) means that the marginal cost of office space is low, and rents are expected to fall when offices are vacant. This entails a movement along the demand curve  $D'$  until the quantity of office space traded has returned to pre-pandemic levels,  $\bar{Q}$ .

In contrast, figure 2 assumes that the supply of office space is inelastic relative to demand, but not perfectly inelastic. In this case, most of the adjustment occurs through a decrease in prices. In the long run, a lower quantity of office space ( $Q_3$ ) is traded than before the COVID-19 pandemic.

**Figure 4.4 – Vacancy rates in CBDs increased when the pandemic began**  
**Commercial real estate vacancy rates in Australian CBDs**



Source: Property Council of Australia (2021a).

Having employees work from home will mean that some businesses could have the option to downsize their office space or shed the office entirely. Many firms will be less willing to pay for larger offices in city centres, and may not renew leases at the same rate if their workforce is regularly working from home (box 4.2). But it is not just a matter of reduced demand for office space; the nature of office space will also change.

As many businesses experiment with the hybrid model (chapter 2), the function of offices will increasingly be to facilitate collaboration, and individual work will be done at home. This means office spaces will need to change to suit more ad-hoc, collaborative and social interactions. Moreover, offices may need to become more appealing to incentivise employees away from their homes. Office designs might need to be reconsidered to make them more attractive to employees, and to better — and more efficiently — foster the collaborative and creative benefits that come from in-person interaction.

### Commercial real estate could be repurposed, but that will take time

Higher vacancy rates and decreasing rents would also provide some incentive for office space to be repurposed. This would decrease the supply of commercial office space and curb the downward pressure on rents. But several factors make repurposing office space difficult.

- There are regulatory costs associated with repurposing. For example, apartments require plumbing and windows in bedrooms, and ceilings may need to be raised. The Property Council has estimated that it would cost 20–30% more to retrofit existing offices than to simply demolish buildings and build new apartments (Hall 2021).
- There is uncertainty about the future of work. It is not clear to what extent businesses will shed office space after the pandemic. Some owners of commercial office space in Australia are reticent to repurpose office space because they are waiting to see if the movement away from CBDs is a permanent or temporary shock (Hughes 2021).

- Demand for hotels and inner city apartments have declined due to the COVID-19 pandemic and the ensuing decrease in international movement of people. This dampens incentives for commercial real estate to be converted into these types of dwellings.

In the long term, the ability of commercial office space to be repurposed will be largely affected by planning and zoning regulations. Businesses' adjustment to the changes associated with increased work from home may also occur through innovations in how commercial real estate is structured, such as through combinations of residential and commercial properties. The Productivity Commission (2020) has argued previously that zoning arrangements should remain flexible, finding the right balance between regulation and market-based approaches, to allow innovative land use to adapt to changing economic circumstances.

Overall, this suggests that even if there is some shift of economic activity away from city centres, there are a number of factors that will mitigate the overall impact. These include the continued importance of the office under the hybrid work model and rent adjustments that could attract new entrants to the CBD in search of the agglomeration benefits still available. These effects provide city centres with a degree of natural resilience to increased working from home.

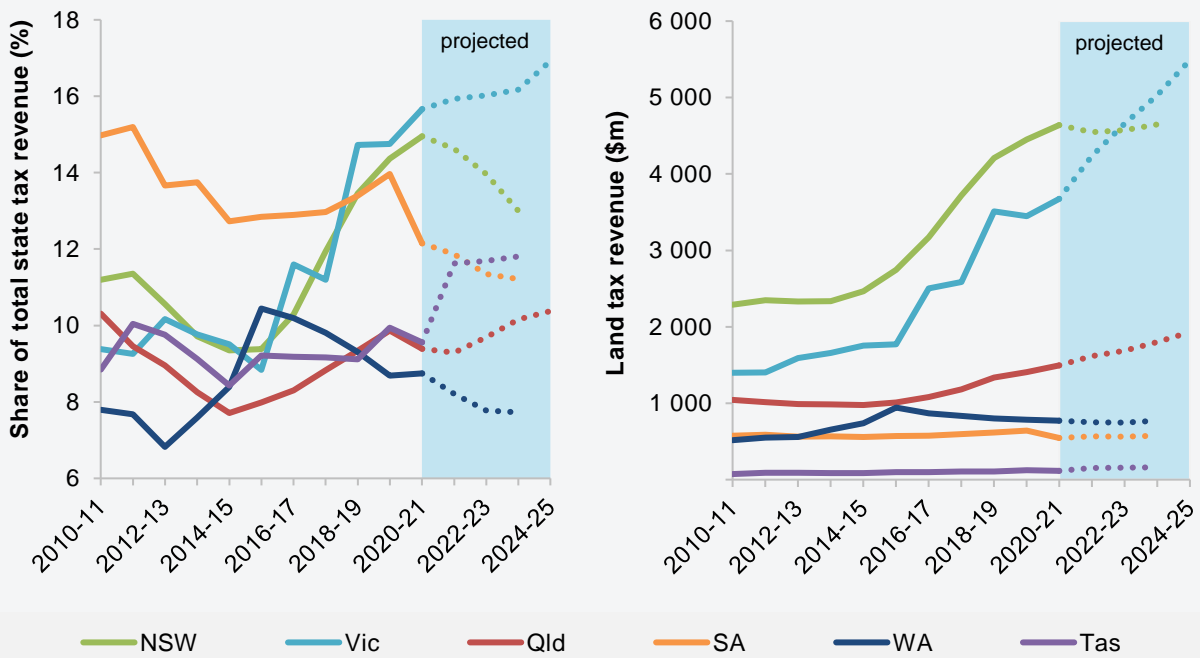
In theory, that resilience would be tested if the change to the location of work was more dramatic. If the decline in the number of people working and living in the city was too great, then the expected agglomeration benefits to individual firms could decline sufficiently to hit a 'tipping point'. Such a scenario could potentially lead to a downward spiral resulting in the CBD being 'hollowed out' of economic activity. Under that scenario, the reduction in rent could be large and enduring before any rebound in demand is observed. This could have adverse effects on land values in CBDs and subsequent government revenue (box 4.3). However, even if all people who could work from home did so for two days per week, it is unlikely that more than 13% of total work hours will be done in the home (chapter 2). This makes the 'tipping point' scenario unlikely without significant economic transformation.

**Box 4.3 – Changes in land values could affect state government revenues**

Any modest relocation of economic activity could have non-negligible effects on the value of land in cities; in turn suggesting a decrease in land tax revenue for state governments. Land taxes make up a substantial proportion of state government revenue. By 2023, all Australian state governments, with the exception of Western Australia, expect land taxes to comprise more than 10% of their tax revenue, with Victoria and Queensland projecting large nominal increases in land tax revenue. Although Property Council (2021b) data suggest that industry expectations about the future capital value of office property has been recovering steadily since June 2020, this is still placing a high reliance on an uncertain source of tax revenue. This creates some risk to revenue because more hours worked — and therefore more value added — could occur in untaxed premises, the family home, as distinct from taxed premises, the office or workplace.

**Some states plan to rely less on land tax revenues than others**

**Land tax revenue as share of total state tax revenue (left) and nominal land tax revenue in \$millions (right)<sup>a</sup>**



a. The Northern Territory does not levy land tax. The ACT was not included as the itemised projected revenue data was not available.

Source: ABS (*Taxation Revenue, Australia, April 2021*, Cat. no. 5506.0); New South Wales Government (2020); Queensland Government (2021); South Australian Government (2020); Tasmanian Government (2020); Victorian Government (2021); Western Australian Government (2020).



## 4.2 How could working from home change where people live?

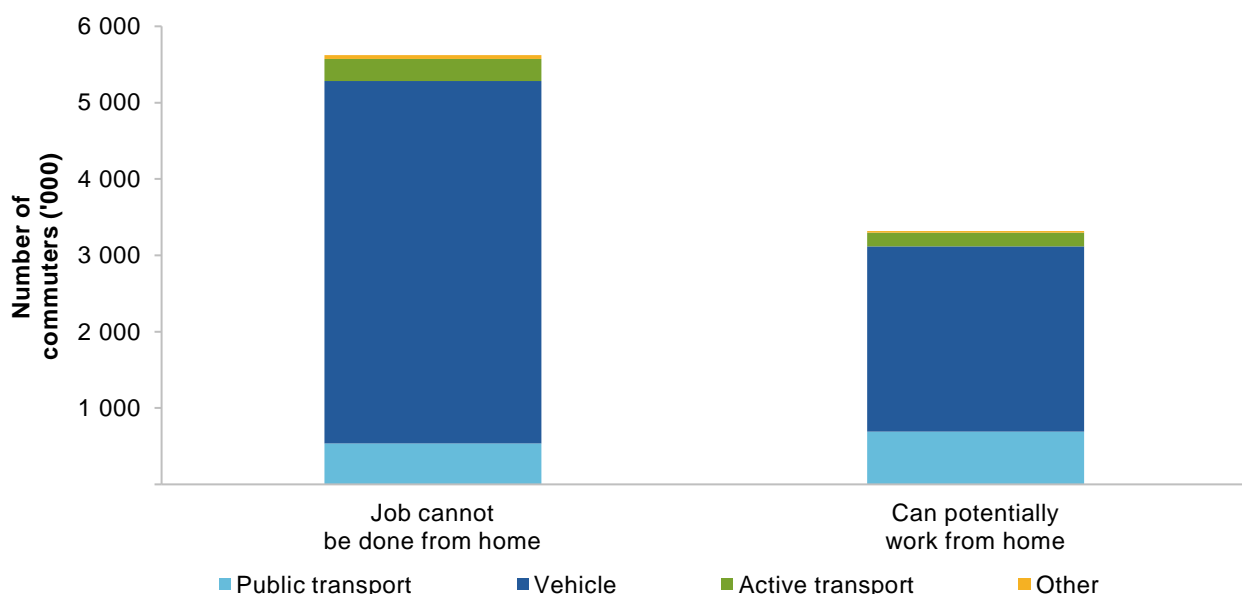
### Changes to peoples' commutes to work could reduce congestion ...

One of the main benefits of working from home is the ability for people to avoid the commute to work. A long-term increase in the number of people working from home would reduce the total number of people commuting into city centres and business hubs every day. This would potentially decrease commuter congestion in major cities (Mokhtarian 1991; Mokhtarian, Collantes and Gertz 2004; Mokhtarian, Handy and Salomon 1995; Nilles 1973, 1991).

The cost that congestion imposes on peoples' daily lives, in terms of the time and resources wasted, is substantial. In 2020, COVID-19 related reductions in car and public transport commutes in the Greater Sydney Metropolitan Area saved an estimated \$5.6 billion in annual travel time costs. Much of this saving can be attributed to decreases in congestion (Hensher et al. 2021).

The greatest potential for reduced congestion would be from the reduction in vehicle<sup>9</sup> commuting on roads. In Australia, around 2.4 million people are employed in jobs that can be done from home and commute to work by vehicle (figure 4.5). This represents approximately 27% of all commuters and is a substantial potential reduction in daily commutes. There is also the potential for public transport to become less congested, with nearly 700 000 public transport commuters employed in jobs that can be done from home. This comprises about 56% of all public transport users and approximately 8% of all commuters.

**Figure 4.5 – Many commuters can work from home**  
Transport mode by potential to work from home, 2016



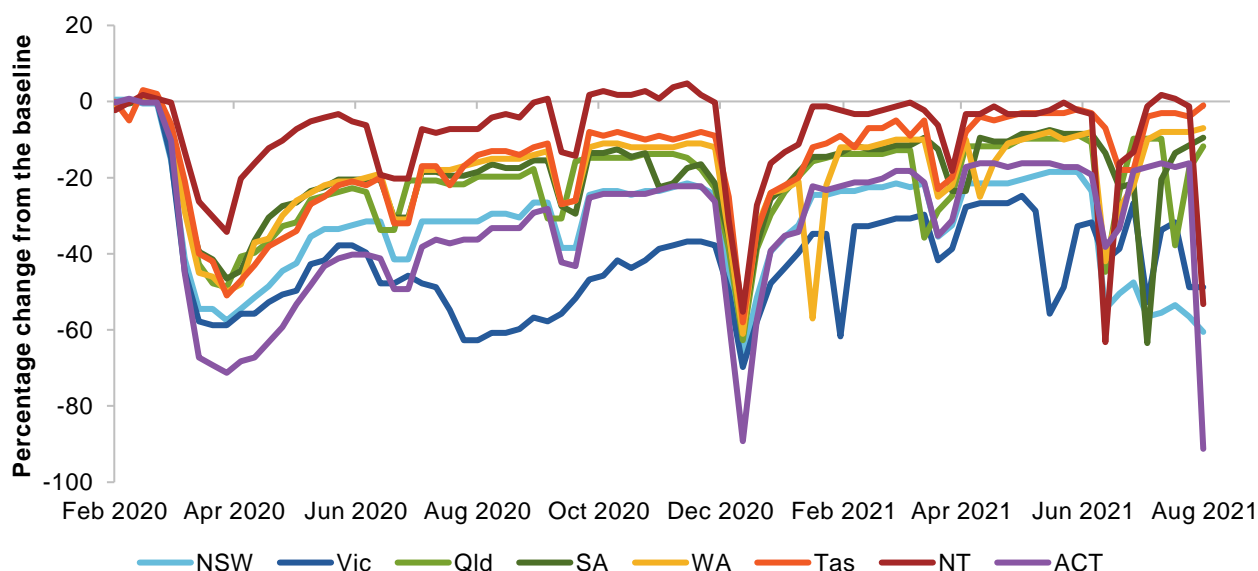
Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

<sup>9</sup> Vehicle commuting is predominantly by car, but also includes motorcycles, scooters and trucks.

Commuting levels have decreased since working from home has become common. From April 2020 to April 2021, Australians commuted into workplaces at a significantly lower frequency than prior to the COVID-19 pandemic (figure 4.6). The effects of the COVID-19 pandemic cannot yet be separated from a long-term trend towards more working from home. The effects of lockdowns can be seen clearly. Although there is a slight trend back to baseline in some states and territories, levels still remain low.

**Figure 4.6 – People are travelling into work less than they did before the COVID-19 pandemic**

**Workplace visits<sup>a</sup> relative to pre-pandemic baseline<sup>b</sup>**



- a. These data are an anonymised, aggregated dataset collected by Google using Google Account location services.
- b. Baseline adjusted to be average between mid-February and mid-March 2020.

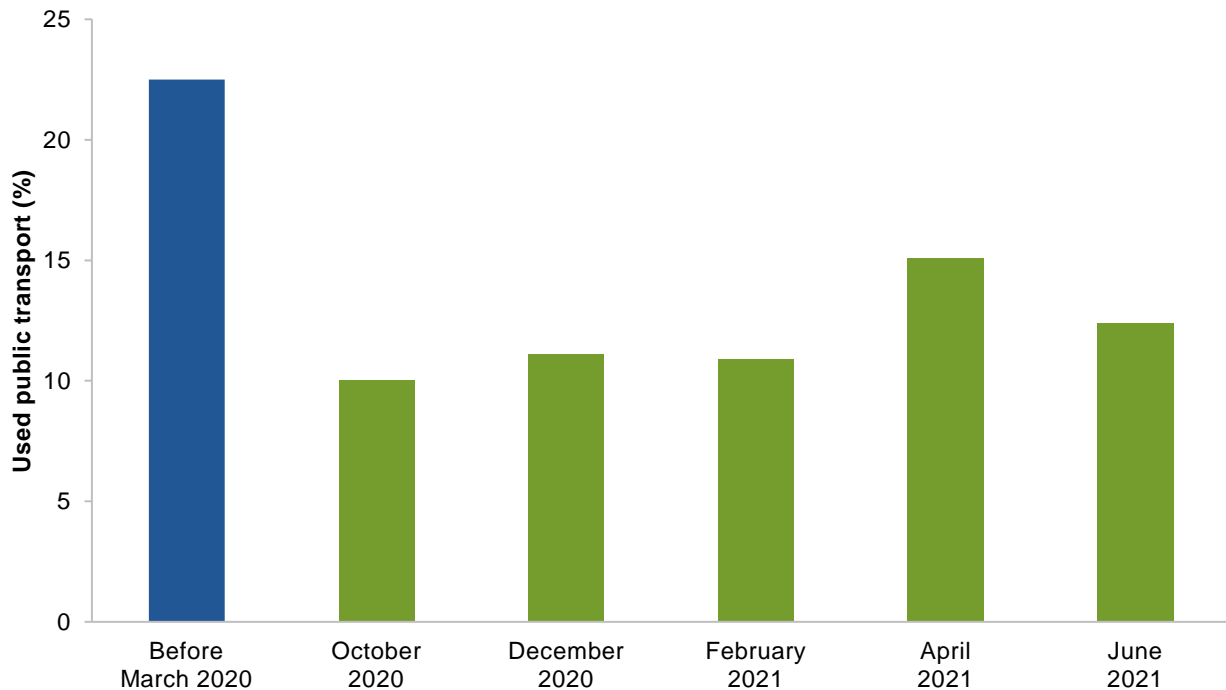
Source: Google (2021).

### ... but people could change their commuting and driving habits

However, a decrease in the number of commuters does not *necessarily* imply a decrease in congestion if people change their commuting habits. If commuters who used public transport pre-pandemic switch to using their cars, this could actually increase congestion on the roads (Beck and Hensher 2021).

Australian commuters were encouraged by governments to avoid public transport during the height of the COVID-19 pandemic (Beck, Hensher and Wei 2020), and this aversion has persisted even when there have been limited restrictions on movement (figure 4.7). Beck, Hensher and Wei (2020) have argued that commuters are switching from public transport to car commuting because of COVID-19 concerns. A survey of 2300 Australians conducted by the Tourism and Transport Forum Australia (2020) in November 2020 found that 86% of respondents believed public transport posed a moderate-to-high risk of COVID-19 transmission. Even after Australia emerges from the COVID-19 pandemic, 12% of Australians stated that they will no longer use public transport (ITLS 2021). Infrastructure Australia (2020) noted that at the end of 2020, despite low public transport use, road congestion was at near pre-COVID-19 levels. This suggests that a substitution from public transport towards road travel occurred.

**Figure 4.7 – People were still avoiding public transport in June 2021**  
**Proportion of people aged 18 years and over who used public transport in Australia, selected months<sup>a,b</sup>**



**a.** Persons aged 18 years and over who used public transport once or more a week during the stated month. **b.** Includes use of public transport ‘all or most days’ or ‘at least once a week’ in the last four weeks at the time of reporting. Data were not collected every month.

Source: ABS (*Household Impacts of COVID-19 Survey, March 2021*, Cat. no. 4940.0).

Australia compares poorly to American and European cities in terms of road commute times (Wu et al. 2021). A decrease in the use of public transport and corresponding increase in road use would exacerbate this problem. It is possible that as the COVID-19 pandemic subsides public transport use could recover, especially if public transport is less crowded than roads. But people may continue to avoid public transport for the reasons stated above. To address this issue, governments could combine public messaging on safe public transport commuting — when the risk of COVID-19 is sufficiently low — with road-pricing schemes to reduce road congestion (PC 2017).

If more people continue to work where they live, congestion may decrease in city centres. However, some evidence suggests that people who work from home take more frequent work and non-work trips via car (Zhu 2012). Increased non-work trips are especially likely when avoiding the commute frees up the household vehicle for non-work trips (Kim, Choo and Mokhtarian 2015). In that case, road use may increase in suburban and regional areas, which, depending on road capacity, may sometimes lead to suburban congestion.

The potential benefits of reduced congestion are uncertain. Firms and workers are still learning how best to organise working from home, and commuting habits will take some time to adjust after the pandemic, but ultimately, congestion pressures will re-occur as Australian cities expand.

## Less frequent commuting means people could be willing to live further away from city centres ...

In the longer term, working from home could change the geographical link between where people live and where they work, meaning that commuting distance, time and costs have less influence on where people seek work or where they choose to live (Doling and Arundel 2020).

In principle, households that work from home can live further away from their place of work (Brueckner, Kahn and Lin 2021; Doling and Arundel 2020; Lennox 2020; Liu and Su 2020; Ramani and Bloom 2021). This means that people who are able to work remotely could access large improvements in wellbeing by avoiding commuting and moving to more affordable neighbourhoods, further from the centre of cities (Delventhal, Kwon and Parkhomenko 2021).

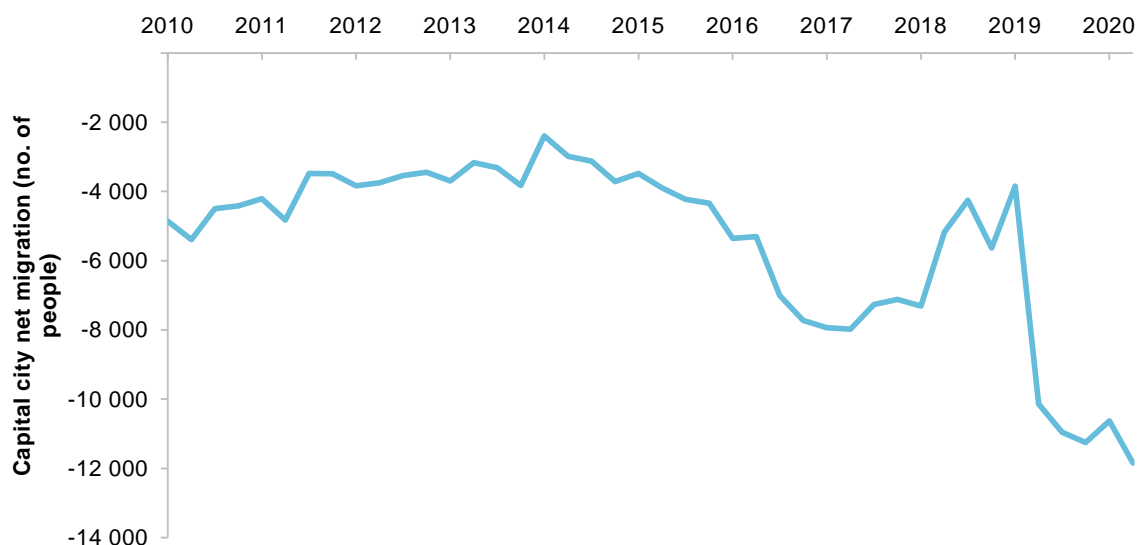
- De Vos et al. (2018) found evidence in Dutch data that working from home prompted people to accept a 5% longer commute on average.
- Lennox’s (2020) geospatial model of working from home in Australia indicated that a willingness to accept a longer commute meant that people were more likely to live further from city centres.
- Ramani and Bloom (2021) suggested that the observed ‘donut effect’ is attributable to the hybrid working model, where households are willing to accept longer commutes if they are less frequent.

Access to full-time work from home might be enough to persuade some households to leave cities entirely. But decisions to relocate are not made lightly, with migration limited by factors such as community, schooling, access to employment and stamp duty.

There is some evidence that, during 2020, Australian households moved from cities to regional areas at higher rates than before the pandemic (figure 4.8). Net internal migration away from capital cities increased from nearly 4000 people in the fourth quarter of 2019 to over 10 000 in the first quarter of 2020. This level appears to have remained relatively stable through to the first quarter of 2021, although it is unclear if this is an ongoing trend or a temporary response to the COVID-19 pandemic (Infrastructure Australia 2020).

**Figure 4.8 – Some people are leaving Australia’s capital cities**

**Quarterly net internal migration, greater capital cities combined<sup>a</sup>**



a. Negative values indicate that Australians are leaving capital cities and settling in non-capital cities.

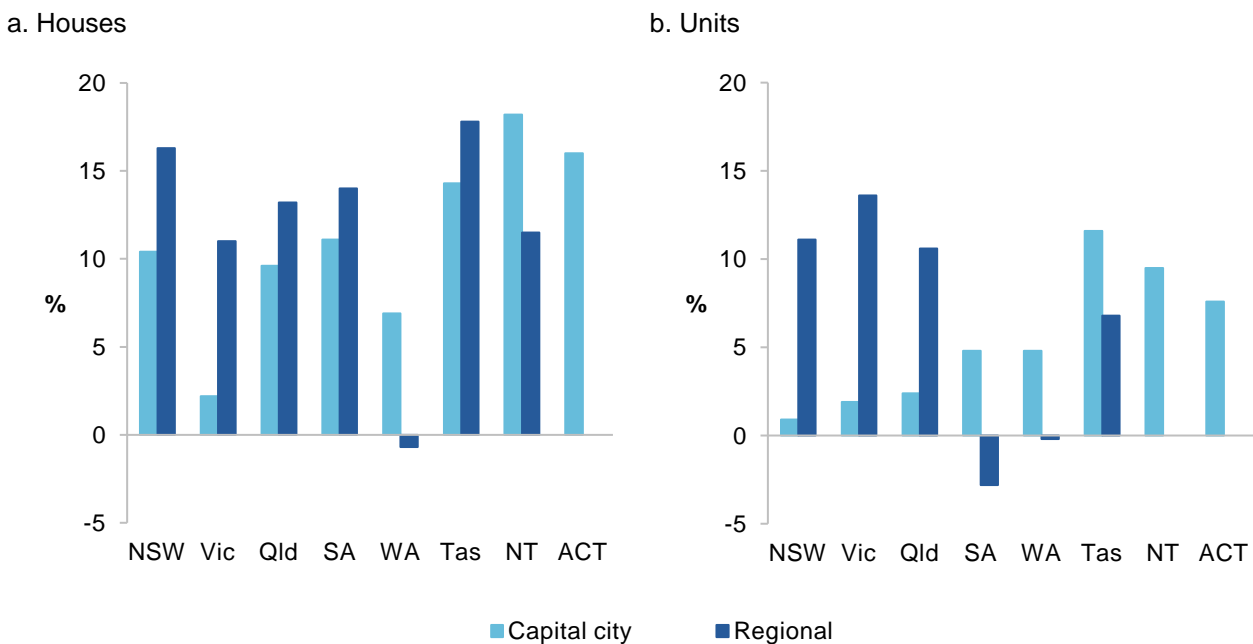
Source: ABS (*Regional internal migration estimates, provisional, May 2021*, Cat. no. 3412.0.55.005).

The effects on major cities are minimal — net migration from capital cities since March 2020 has been approximately 55 000 people, representing around 0.33% of people living in major cities across Australia.

Because regional areas have much smaller populations, the effects on local economies are likely to be more substantial. A population shift towards regional areas would increase demand for housing and infrastructure, such as roads and telecommunications, as well as services such as healthcare, education, childcare and community development.

This movement of population out to regional areas also has the potential to significantly affect regional property prices. Growth in prices for property in regional areas generally outstripped those in urban areas from March 2020 to March 2021 (figure 4.9). This is especially prevalent in states with the largest populations (New South Wales, Victoria and Queensland). Although there could be numerous factors contributing to this, the evidence is consistent with an increase in demand for regional housing over urban housing. However, longer-term trends will need to be monitored to disentangle this from other effects, such as the temporary effects of the COVID-19 pandemic.

**Figure 4.9 – Property values are generally increasing faster in regional areas than in cities**  
**Change in house and unit property values, 31 March 2020 to 31 March 2021<sup>a</sup>**



a. Regional house prices for the ACT and regional unit prices for the ACT and NT not available.

Source: CoreLogic (2021).

### ... people may demand different kinds of houses in the longer term

People who work from home require space to work. This means that their current houses and apartments may be insufficient to facilitate effective work from home. Some houses need dedicated office or meeting spaces and some may need the capacity to create, store and receive physical goods (Doling and Arundel 2020). Stanton and Tiwari (2021), examined US survey data, and found that before the pandemic remote working households spent 7% more on housing than households that did not undertake remote work. This higher expenditure was largely driven by owning larger houses and a higher price per room. This desire

for larger houses would also correspond to a movement away from the centre of cities to suburbs (Delventhal, Kwon and Parkhomenko 2021).

People who work from home are likely to want more rooms so that they do not have to share working space. One survey conducted in May 2020 found that, of those Americans who worked from home, 51% worked either in their own bedroom or in a shared room (Bloom 2020). A 2020 survey found that 26% of Australians reported working with someone else in the room when working from home (Beck and Hensher 2021).

There is some evidence that the COVID-19 pandemic has also seen an increase in demand among high- and middle-income earners for lower-density living now that working from home has become more common (Maclennan et al. 2021). This could be attributed, in part, to the fact that COVID-19 has motivated many people to avoid crowded areas (Liu and Su 2020). If this change in preferences endures, then the shift in demand is also likely to continue past the pandemic.

### **4.3 What does this all mean for cities?**

Working from home is likely to persist at higher rates than before the pandemic. Where the centralised workplace was once the sole focus of many peoples' working lives, the home now plays a new role. This will alter people's transport and commuting patterns, and potentially where they live and the types of housing that they want to live in. In the first instance, it will mean fewer people in CBDs and commercial centres, and changes to where people spend their money before work, at lunch time and after work.

These changes will prompt a range of reactions and second-round effects, which will also alter the makeup of cities. These include changes to where some businesses locate and where some people choose to live. For example, fewer hairdressers may be seen in Brisbane's CBD and more in Norman Park, fewer cafes in Perth's CBD and more in Inglewood. There may also be fewer people living in the inner suburbs of cities, with more people moving outwards, to larger houses with space for a home office. There will likely be fewer people on peak-hour trains, and more people walking to local shopping strips.

But just as people and businesses are adapting to the possibilities of widespread work from home, they will also adapt to the changes it brings. For example, any decrease in the cost of renting office space in cities — combined with the difficulty of repurposing office space in the short term — may enable some firms to take advantage of cheaper or better office space. And the convenience of operating a business with many others located close by, as well as the lifestyle of living closer to the bustling city, are both things that many people are likely to continue to value even when working from home becomes an option.

The aggregate effect on cities will be the sum of all adjustments and reactions on these various dimensions. While increased working from home may change how cities work to some extent, the economic benefits of people clustering together are expected to remain.

## 5. How will working from home affect wellbeing?

### Key points

- \* **While working from home can improve the lives of many Australians, some people have concerns about possible downsides, including loneliness, negative mental and physical health effects and a blurring of the boundaries between work and home.**
- \* **Evidence from before the pandemic about working from home and wellbeing suggests that:**
  - Experiences of loneliness and the mental health of people who worked from home were not substantially different from people who did not, but physical activity was lower among people who worked from home. Diminished physical activity may be a longer-term concern.
  - Working from home improved the work–life balance of some people, whereas others found it difficult to switch off and maintain work–life balance when working from home.
  - Working from home was not associated with a more even distribution of unpaid work in the home. Working men were often assessed as ‘doing less than their fair share’ by their partners, regardless of their work-from-home status.
- \* **The benefits of working from home will flow mainly to employees who are well paid and highly educated. However, it may also open up work opportunities for people who face barriers to labour force participation or full-time employment, such as people with disability or caring responsibilities.**

As noted in chapter 2, many employees have expressed a preference for working from home at least some of the time. That stated preference involves weighing up several factors: the cost of the commute; the flexibility of home-based work; the potential loss of social contact in the office; and a number of other considerations that might be relevant to an individual.

But we are at an early stage in the work-from-home experiment. Attitudes may change as people gain experience of the benefits and costs and learn more about the trade-offs. Some commentators argue that there could be hidden costs — to the individual or society more broadly (for example, Sander 2019).

It is important to ask: what do we know about the effects of working from home? This chapter draws on what we know about the wellbeing of employees who chose to work from home prior to the pandemic and of those who were instructed to do so during the pandemic. It also describes potential equity effects of working from home. Of course, with greater uptake of working from home, it is possible that different concerns could arise in the future.

## 5.1 How does working from home affect wellbeing?

Working from home has the potential to have both positive and negative effects on wellbeing. As chapter 2 indicated, working from home gives people extra time and flexibility to schedule non-work activities and to balance competing life priorities. But eliminating the line between home and work — a phenomenon referred to as ‘blurred boundaries’ — can prove challenging (Allen, Golden and Shockley 2015; Eurofound and ILO 2017; Karanikas and Cauchi 2020; Kniffin et al. 2021; Vohra 2020).

Working from home can affect various aspects of wellbeing, including:

- physical and mental health
- work–life balance
- the gendered distribution of labour.

### Physical and mental health

Working from home has the potential to influence people’s health in different ways. Working from home can improve physical and mental health as it gives people more time to exercise, sleep, cook nutritious food, or engage in other health enhancing activities. But it can also worsen physical and mental health due to decreased incidental exercise, isolation, and the elimination of the boundaries between home and work, which can lead workers to work longer than planned or at times that would otherwise be recreational.

### Employees working from home prior to the pandemic exercised less ...

Working from home has the potential to reduce physical activity due to a reduction in incidental exercise — even among those people who use passive transport modes, who make up the majority in Australia (figure 5.1). Research from the United Kingdom suggests that the average public transport commuter misses out on 21 minutes of incidental exercise for each day that they work from home (Patterson et al. 2019). A reduction in physical activity can lead to an increase in a range of diseases including obesity, heart disease, diabetes and osteoporosis (AIHW 2017).

Employees who worked from home before the pandemic were less likely to engage in high levels of physical activity than those working from a centralised workplace, particularly those who were aged 45 years and older (figure 5.2). This means that employees working from home exercised on fewer days per week or exercised less vigorously than those who did not work from home.

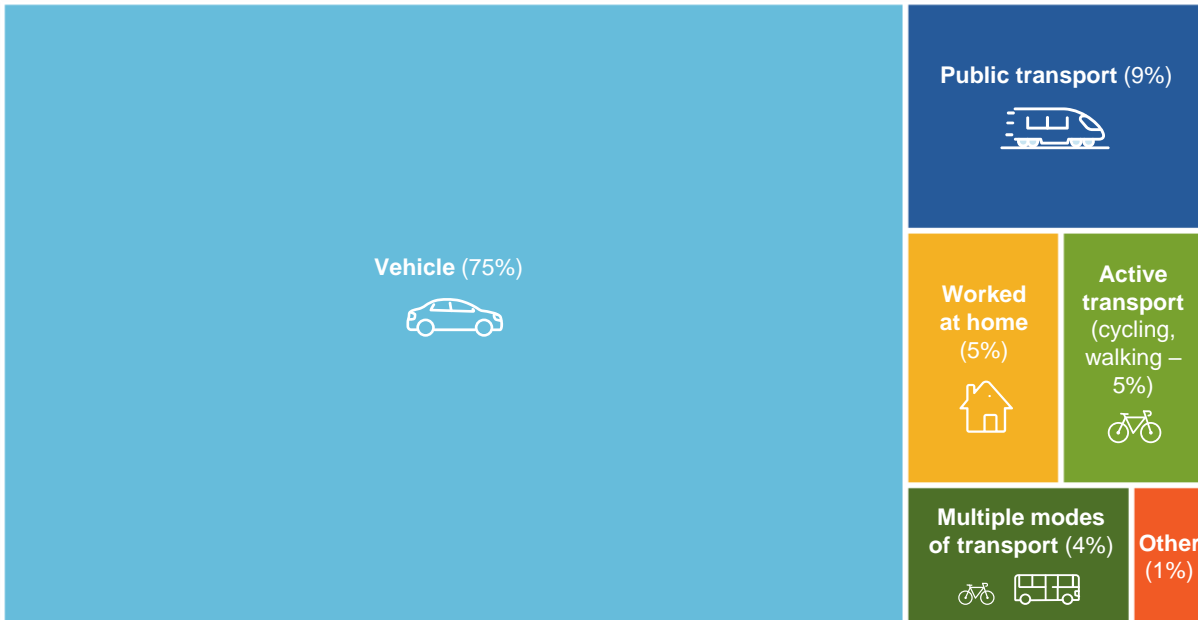
### ... but were equally likely to experience loneliness or mental ill-health

The pathways through which working from home can affect mental health are multiple and often heavily interconnected. Two key mechanisms are the lack of a clear demarcation between home and work, and loneliness due to changes in professional (and personal) relationships (Eurofound and ILO 2017; Harvey et al. 2014; PC 2020; Rohde et al. 2016; Terhaag et al. 2020).



**Figure 5.1 – Most people go to work by car**

Share of workers who took different modes of transport to work, 2016<sup>a</sup>

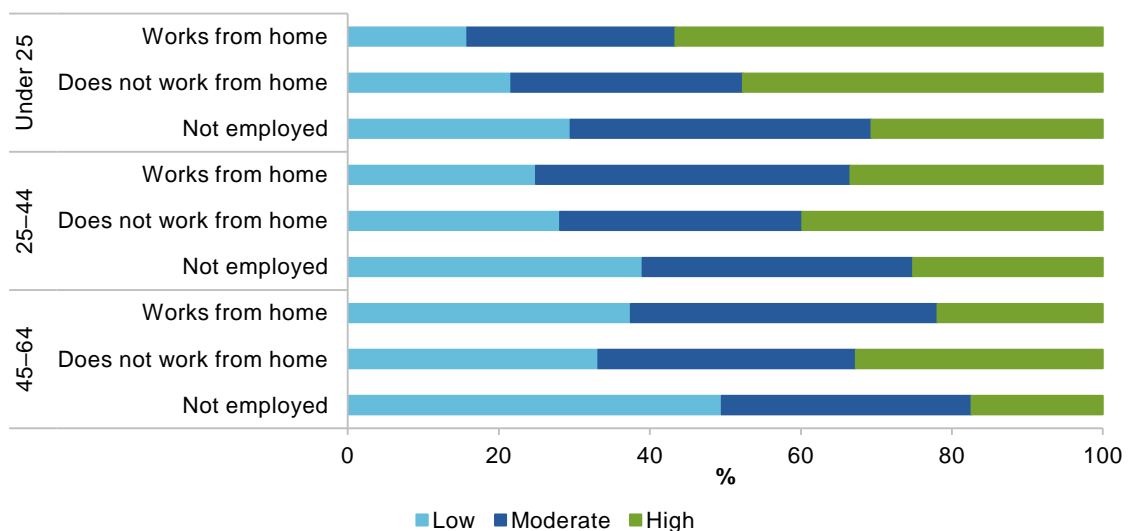


a. Percentages do not add up due to rounding.

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016, Cat. no. 2037.0.30.001*).

**Figure 5.2 – Employees 45 years and older who worked from home were less prone to engage in high levels of physical activity**

Proportion of the population who engage in high, moderate and low levels of physical activity by employment and work-from-home status, 2019<sup>a</sup>



a. Responses denote the overall physical activity level of each individual, categorised as low, medium and high activity. Individuals are assigned to these categories based on the total activity done in a week measured in metabolic equivalent of task minutes. Figures are population weighted.

Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

Avoiding the commute takes away many of the physical cues that come with working from the office, which can lead employees to feel less able to mentally ‘switch off’ (Asana 2021, p. 15; Culture Amp 2021). This, in turn, can result in long workdays and, eventually, burnout.<sup>10</sup> This is likely to be exacerbated for workers who feel compelled to respond to colleagues outside of standard work hours.

[W]orkers often unintentionally make it hard for their supervisors, colleagues, and employees to maintain boundaries. One way they do so is by sending work emails outside office hours. In five studies involving more than 2000 working adults, we found that senders of after-hours work emails underestimate how compelled receivers feel to respond right away, even when such emails are not urgent. (Giurge and Bohns 2020)

This underscores the importance of being able to ‘disconnect’ from one’s job (Sonnentag 2012; VonBergen and Bressler 2019). Australian unions have recently proposed a ‘right to disconnect’ as part of employment agreements (chapter 3).

Evidence from pre-pandemic survey data indicates that work hours were similar for employees working from home and those working in a centralised workplace (figure 5.3).

Working from home can improve family relationships but may also lead to feelings of isolation from colleagues if it leads to fewer opportunities for interaction and relationship building (Eurofound and ILO 2017; Fell 2020; Holland et al. 2016; de Vries, Tummers and Bekkers 2019) This can increase loneliness and the risk of mental ill health. As Robert Waldinger, the director of one of the world’s longest studies of adult life which has tracked participants for over 80 years, explained:

[o]ur relationships and how happy we are in our relationships has a powerful influence on our health ... Taking care of your body is important, but tending to your relationships is a form of self-care too. (Mineo 2017)

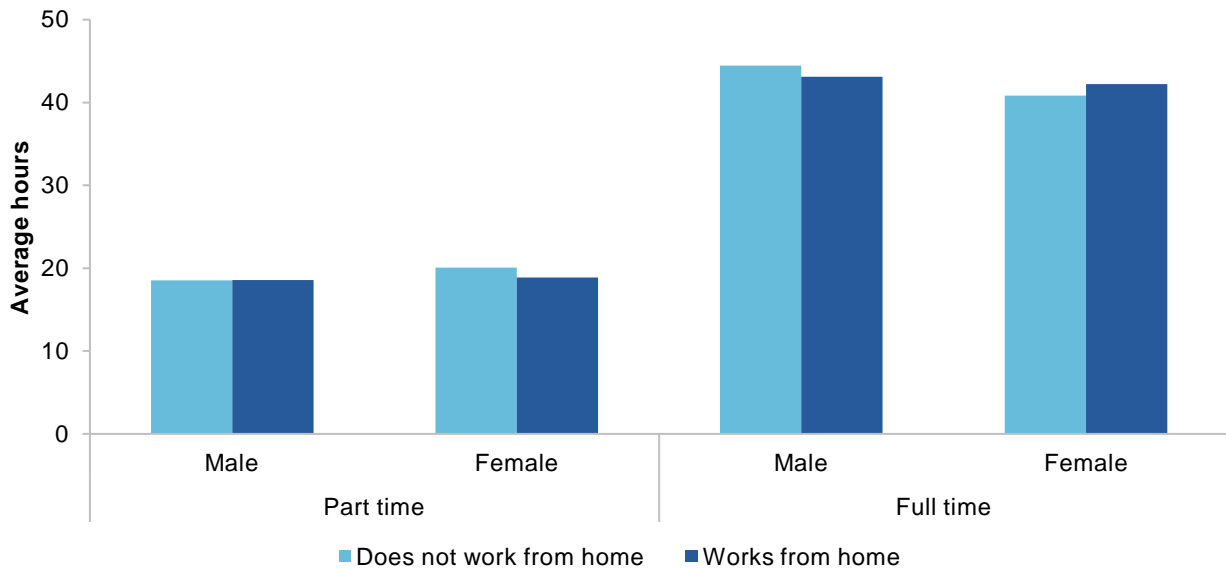
Family functioning, loneliness and mental ill-health were similar among those who did and did not work from home, with employment in general being associated with better outcomes (figures 5.4, 5.5 and 5.6).

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<sup>10</sup> Burnout refers to a non-medical syndrome resulting from chronic workplace stress that has not been successfully managed. It includes three dimensions: feelings of energy depletion or exhaustion; increased mental distance from one’s job, or feelings of negativism or cynicism related to one’s job; and reduced professional efficacy (WHO 2021).

**Figure 5.3 – Hours worked were not materially different between employees who worked from home and those who did not**

**Average hours worked by employment and work-from-home status, 2019<sup>a</sup>**

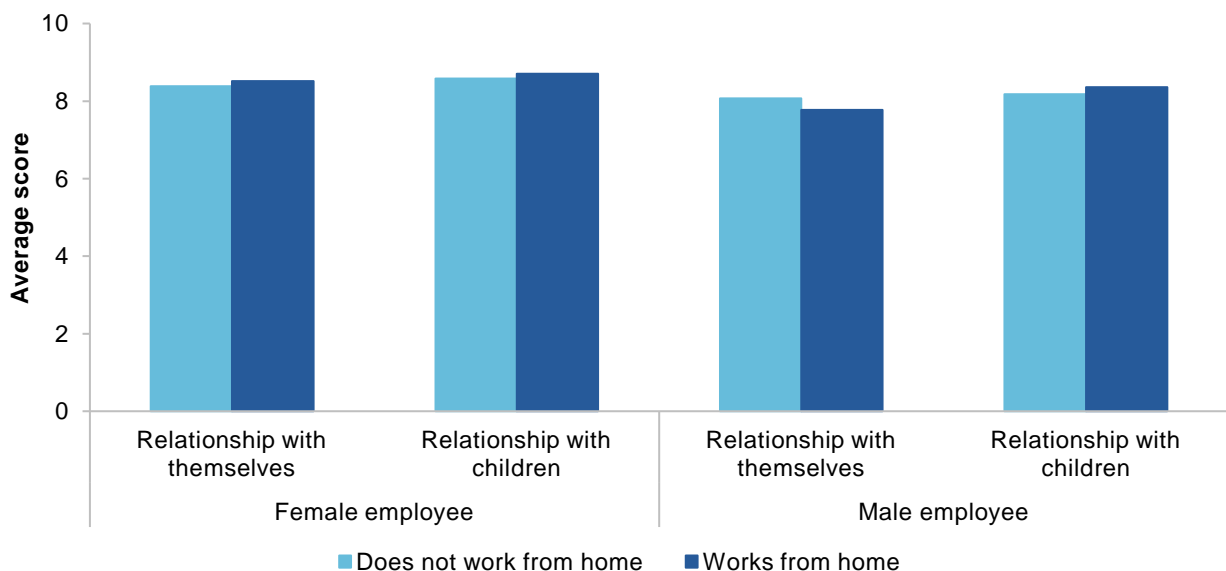


a. Figures are population weighted.

Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

**Figure 5.4 – Working from home did not seem to affect family functioning**

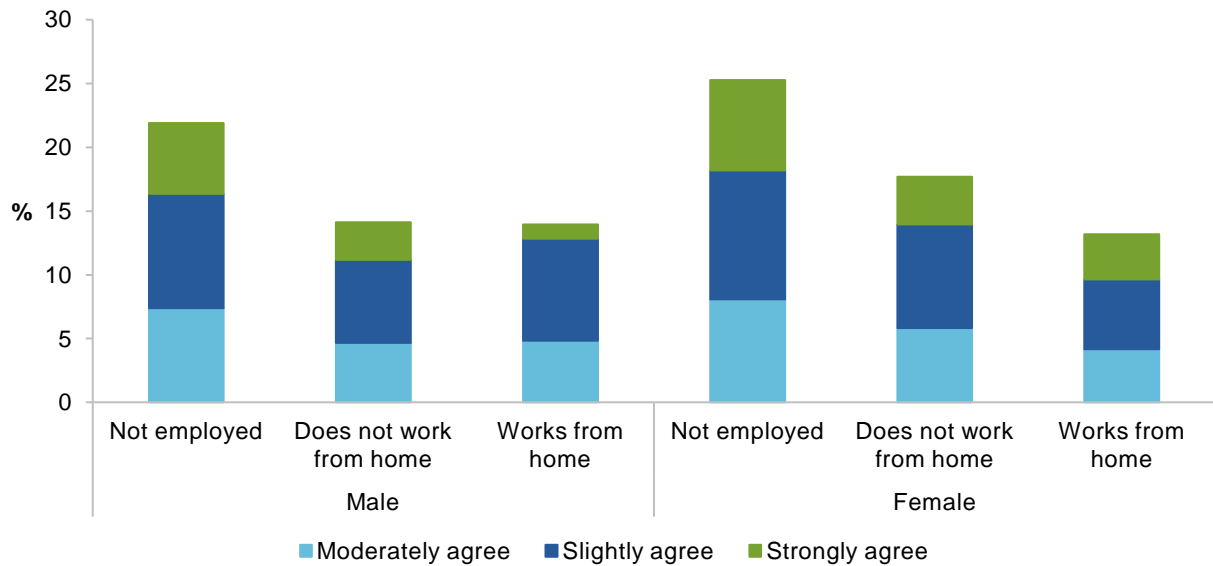
**Partner’s assessment of employee’s relationships on a scale from 0 to 10, 2019<sup>a</sup>**



a. Family functioning indicators of satisfaction with the quality of relationships, according to the employee’s partner. Satisfaction is measured on a scale ranging from 0 (completely dissatisfied) to 10 (completely satisfied). Whether an employee works from home is defined by whether they have a formal work-from-home agreement. Differences between employees who worked and did not work from home are not statistically significant. Figures are population weighted.

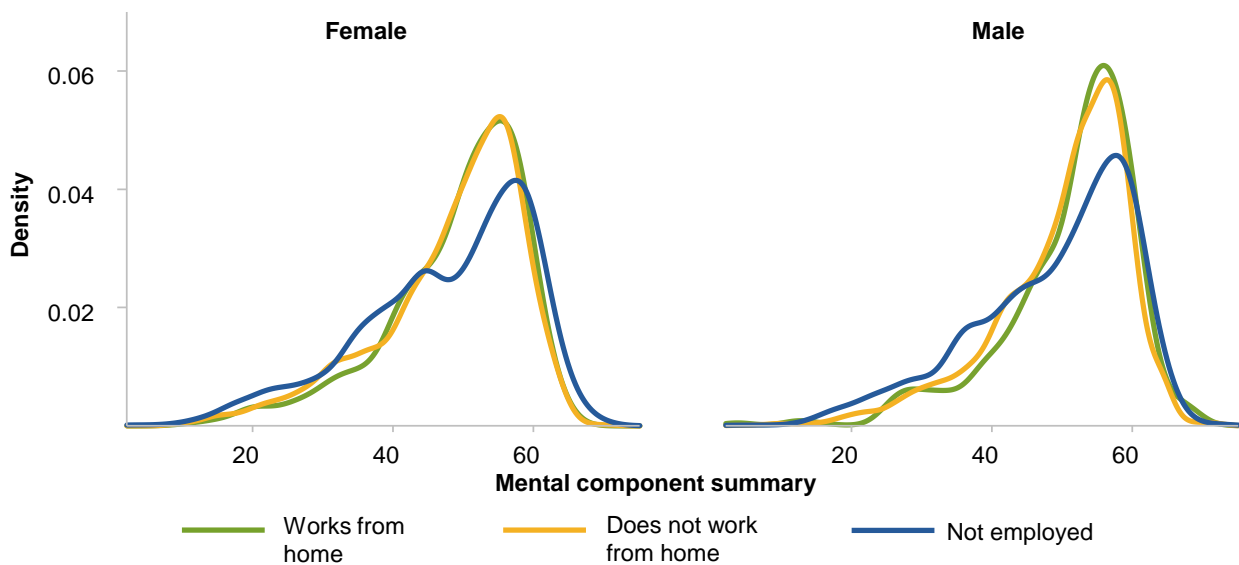
Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

**Figure 5.5 – People who worked from home did not experience more loneliness**  
**Self-reported loneliness by gender and work-from-home status, 2019<sup>a</sup>**



a. Survey respondents were asked to rate on a scale between 1 and 7 the extent to which they agreed or disagreed with the statement 'I often feel lonely'. A score of 1 indicates strong disagreement with the statement and a score of 7 indicates strong agreement. Responses are population weighted. The 'not employed' category refers to people not in the labour force or unemployed. Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

**Figure 5.6 – There was no difference in the mental health of people who did and did not work from home**  
**SF-36 Mental Component Summary by work-from-home status, 2019<sup>a</sup>**



a. Higher scores indicate better mental health. The mental health score presented is the 'mental health component summary', and is derived from responses to the Short Form 36 (SF-36) questionnaire, and transformed into a range from 0 to 100, with a mean of 50 and standard deviation of 10 (Ware and Kosinski 2001). The category 'not employed' refers to people unemployed or not in the labour force.

Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

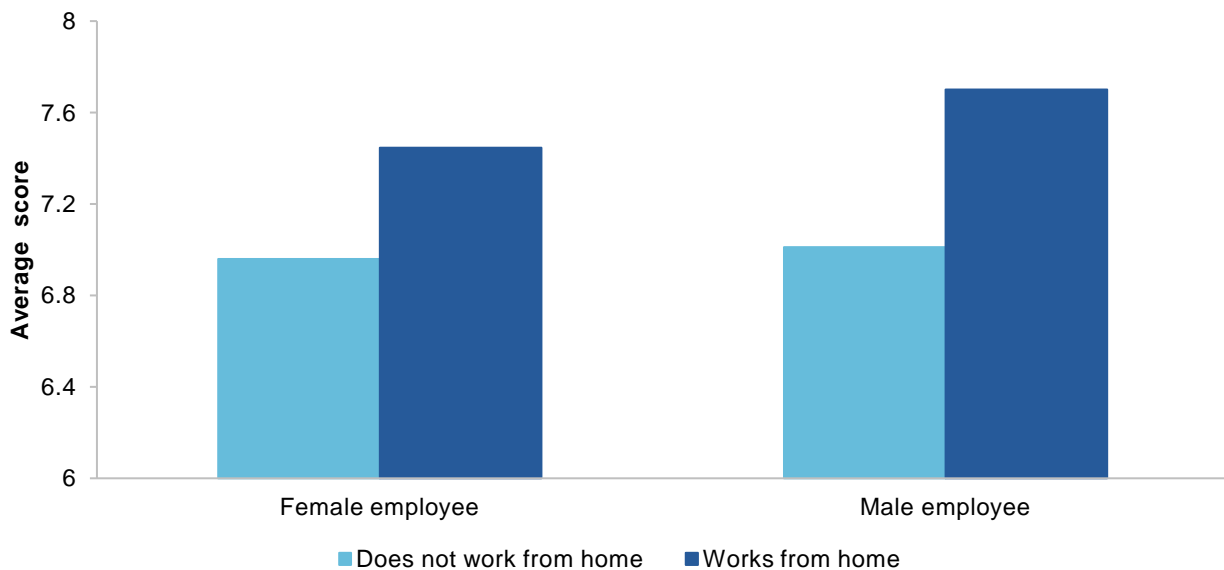
## Work-life balance

Work-life balance refers to an individual’s perception that work and non-work activities are compatible and promote growth in accordance with an individual’s current life priorities (Kalliath and Brough 2008). The extra time gained by avoiding the commute to an office may allow employees to improve their work-life balance. But, as noted above, removing the physical demarcation between work and home can make it harder for some workers to mentally ‘switch off’, and may lead them to work longer hours than planned (ACTU 2020; Li et al. 2020; Oakman et al. 2020) or work outside usual working hours (Nahum 2020).

### Working from home before the pandemic was associated with diverse perceptions of work-life balance

Survey evidence suggests that working from home is associated with improved satisfaction with work-life balance (figure 5.7). However, employee’s perceptions are diverse. While for many people, working from home improves their work-life balance (Masterson 2020; NSW IPC 2020), others find that maintaining a work-life balance is the most significant difficulty they experience when working from home (McCrindle Research 2018).

**Figure 5.7 – Working from home was associated with higher work-life balance satisfaction**  
**Work-life balance satisfaction on a scale from 0 to 10, 2019<sup>a</sup>**



a. Survey respondents were asked to rate on a scale between 0 and 10 the extent to which they were satisfied with the flexibility to balance work and non-work commitments. A score of 0 indicates total dissatisfaction and a score of 10 indicates total satisfaction. Figures are population weighted.

Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia*, wave 19.

Similarly, the evidence on the effects of working from home on work-family balance, a component of work-life balance, is mixed (Allen, Golden and Shockley 2015; Gajendran and Harrison 2007). Households struggle more when working from home is forced rather than offered as a possible work arrangement (Karanikas and Cauchi 2020). There are also differences in how work-family conflict is experienced. For example, women experience greater work-family conflict due to their ‘inability to disengage from work’ whereas men often struggle with the ‘integration of work into the family domain’ (Oakman et al. 2020).

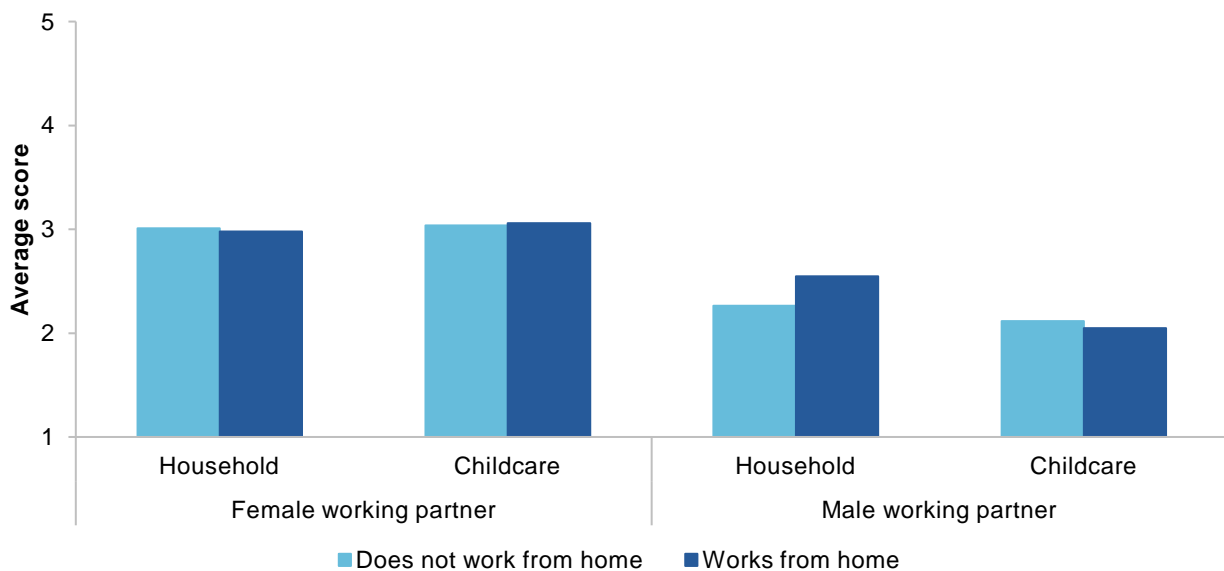
## The gendered distribution of unpaid work

When working from home, individuals may take on a larger share of housework and caring tasks, which could reinforce the gendered division of labour.

One identified family-related disadvantage that may result from working from home is that the telecommuter may be expected to shoulder greater household responsibility because that person “is home all day.” Domestic partners may fail to appreciate the boundary between work and home. This may be especially true for female telecommuters ... Thus, telecommuting on the part of women may reinforce the gendered division of [labour].(Allen, Golden and Shockley 2015, p. 54)

One study has suggested that working from home before the pandemic provided a means of achieving a more equitable distribution of responsibilities associated with childcare, but did not affect the division of household tasks (Dockery and Bawa 2018). However, analysis based on Housing, Income and Labour Dynamics of Australia (HILDA) data from 2019 indicates that working from home was not associated with a fairer or more even distribution of unpaid work. Respondents indicated that their employed female partners, regardless of their work-from-home status, did a fair share of unpaid work. In contrast, working men are likely to be rated as doing less than their fair share of household and childcare tasks by their partners, regardless of whether they work from home (figure 5.8).

**Figure 5.8 – Working from home is not associated with a fairer distribution of unpaid work**  
**Assessment of whether the respondent’s working partner does a fair share of household and childcare work, 2019<sup>a</sup>**



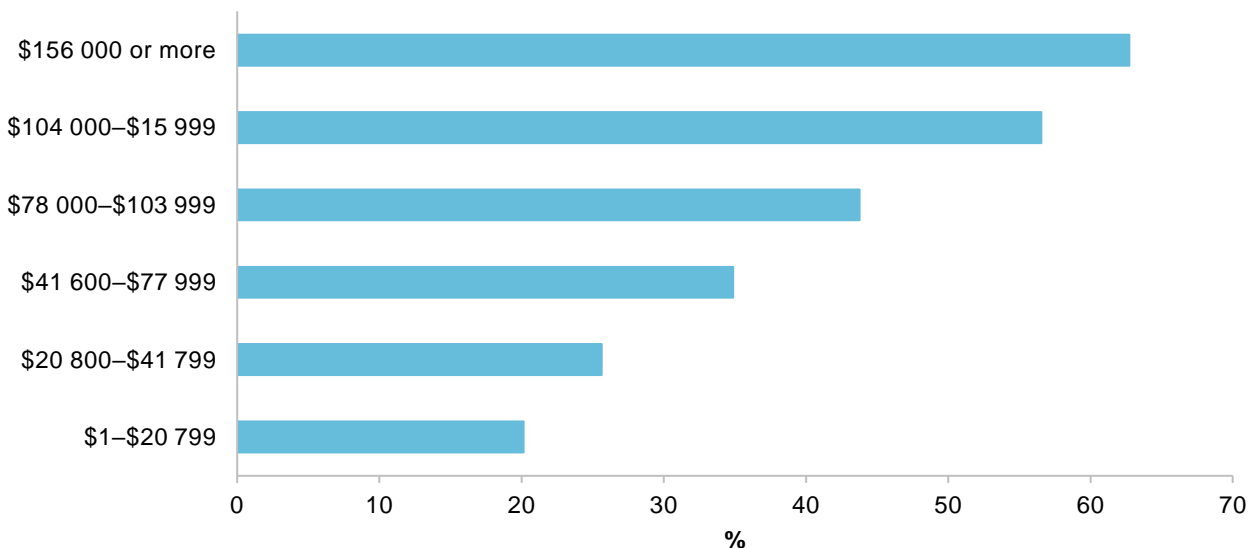
a. Respondents’ assessments of whether their working partner does a fair share of household and childcare tasks are measured on a 5-point scale ranging from 1 (the working partner does much less than a fair share) to 5 (the working partner does much more than a fair share). Differences between partners who did and did not work from home are not statistically significant. Figures are population weighted.

Source: Productivity Commission estimates using *Housing, Income and Labour Dynamics of Australia* (2019), wave 19.

## 5.2 Is working from home equitable?

Working from home has the potential to be a significant gain in wellbeing for many sections of the community. International evidence suggests that employees in high income jobs are more likely to work from home (Bonacini, Gallo and Scicchitano 2020; Irlacher, Koch, and et al. 2021). In Australia, the potential to work from home increases for people with higher income and educational attainment (figures 5.9 and 5.10). In the United States, while people across the workforce value the ability to work from home, it is the highly educated and high-income workers who have jobs with a higher potential to be done from home. They are also more likely to be employed by an organisation that plans to implement work-from-home arrangements post-pandemic (Barrero, Bloom and Davis 2021). At least in the first instance, the benefits of the shift to working from home are likely to flow mainly to higher-income and more educated workers.

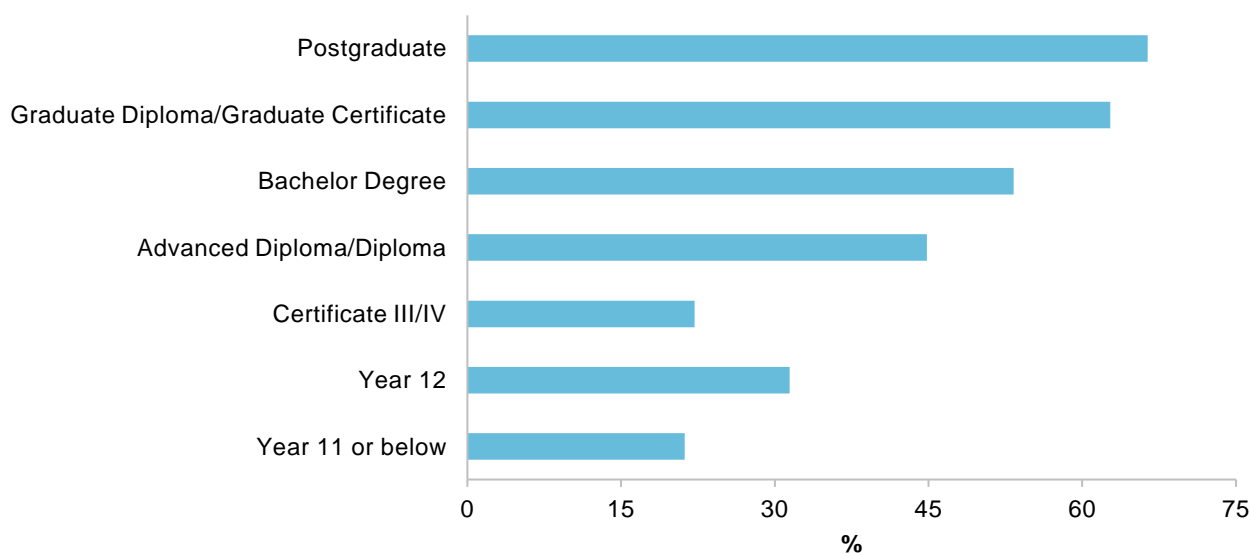
**Figure 5.9 – As income increases, the potential to work from home increases<sup>a</sup>**  
**Percentage of workers who had the potential to work from home, by income range, 2016**



a. The potential to work from home estimation follows Dingel and Neiman (2020) — details in chapter 1.

Source: Productivity Commission estimates using ABS data (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

**Figure 5.10 – The potential to work from home increases with education<sup>a</sup>**  
**Percentage of workers who had the potential to work from home, by highest educational attainment, 2016**



a. Details on the method for estimating the potential to work from home are in chapter 1.

Source: Productivity Commission estimates using ABS data (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

## Working from home could improve access to work ...

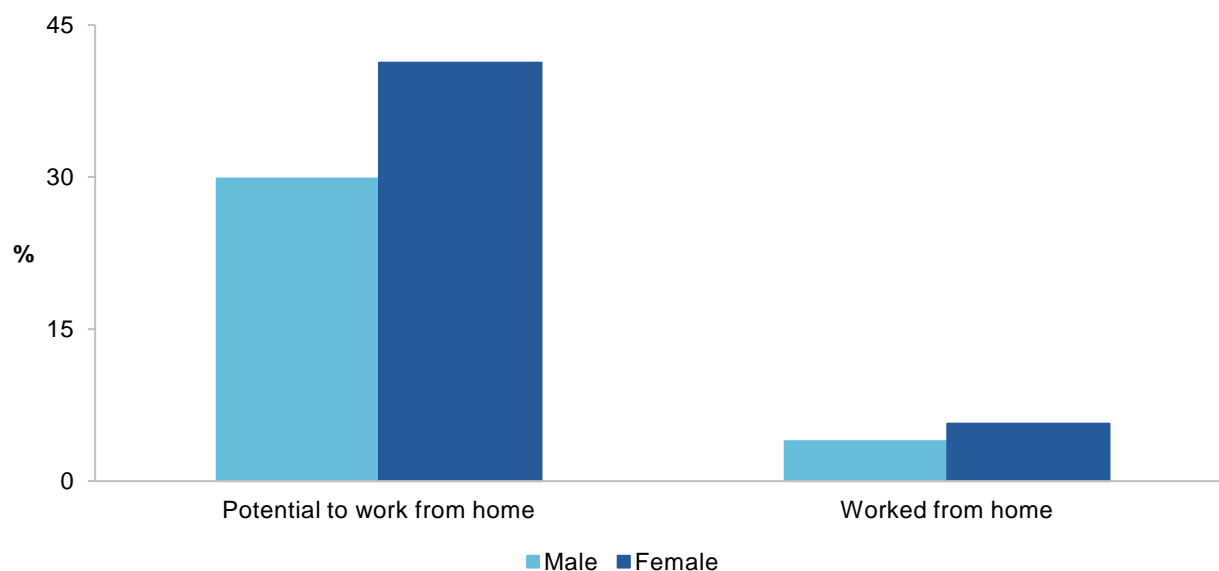
A widespread increase in the adoption of work-from-home practices — particularly fully remote arrangements — could open up work opportunities for people typically less able to work outside the home or in some types of centralised workplaces (chapter 2). This includes carers, parents of young children (who can have difficulties finding alternative childcare options), and some people with disability (Schur, Ameri and Kruse 2020), as well as people living in remote or regional areas where there are often fewer job opportunities in close physical proximity (Victorian Government 2014).<sup>11</sup>

More broadly, work-from-home policies can promote a more gender-balanced workforce. More women than men are in jobs that can be done remotely (figure 5.11). Additionally, since women in Australia still carry most of the responsibility for raising children, and are also more likely than men to care for others (Nous Group 2018, p. 5), the option to work from home may allow them to access employment. This is supported by evidence from the United States, which has found that the option to work from home increases female (but not male) employment — due to reductions in commuting times (Black, Kolesnikova and Taylor 2014). Partners' commuting times also increase female labour force participation, but mainly among couples where the wage gap between partners is large or those with children under five years of age (Carta and Philippis 2018).

<sup>11</sup> Allen, Golden and Shockley (2015, p. 57) even theorised that, in the United States, remote-only jobs could help 'reverse the trend of outsourcing jobs overseas ... Rural outsourcing sends jobs from high-wage urban areas to rural areas in which salaries are lower, enabling individuals to remain in geographic locations that provide a low cost of living'. However, such 'outsourcing' is unlikely to be a possibility in Australia, where the costs of living in remote (and even some regional) areas can far exceed those in urban or suburban areas (HRATSIAC 2009).



**Figure 5.11 – Women could — and did — work from home more than men**  
**Percentage of workers who had the potential to and did work from home, 2016<sup>a</sup>**



a. People are identified as working from home if they worked from home on the day of the Census. Details about the method for estimating the potential to work from home are in chapter 1.

Source: Productivity Commission estimates using ABS data (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

Pre-pandemic, these groups were less likely to be in work than the overall Australian population.

- In 2018, people with disability (who were not living in care accommodation) were much less likely to be in the labour force than those without disability (53% compare to 84%). Carers were also less likely to be in the labour force than non-carers (71% compared to 82%) or be employed (67% of carers compared to 77% of non-carers) (ABS 2019a).
- In 2019, about 37% of single-parent families with children under the age of 15 years were jobless (unemployed or not in the labour force), compared to 4% of couple families with similar aged children (ABS 2019b).
- In 2018, unemployment for the working-age population was substantially higher in outer regional areas (at 7%) than for the total Australian population (at 5%) (AIHW 2019). Long-term unemployment is also more prevalent in regional areas than in capital cities (Cassidy et al. 2020).
- In 2019-20, about two-thirds of women (68%) participated in the labour force compared to more than three-quarters of men aged 20-74 years. For parents aged 20-74 years whose youngest child was under 6 years, only 66% of women compared to 94% of men participated in the labour force (ABS 2020).

An expansion of job opportunities accessible to these groups, driven by an increase in working from home, would therefore improve equity in economic security, and have broader societal benefits. Flexible working arrangements (including remote work, part-time work and amended hours of work) have been held up as a key mechanism by which these groups can engage more fully and successfully in the labour force (box 5.1).

### **Box 5.1 – Flexible work arrangements can increase labour force participation**

Labour force participation is affected by a number of factors, including educational attainment, real wages, and cultural expectations (such as the role of women in raising children) (PC 2016).

The lack of flexible work arrangements, including working from home, can act as a barrier to employment for people with caring responsibilities, people with disability and other workers. Evidence from a survey conducted by the NSW Public Service Association found that a quarter of respondents were aware of an older worker, person with disability or carer who was forced out of a job because they could not access flexible working arrangements (NSW Public Service Association 2015). Data from 2012 showed that around 70-75% of people with caring commitments or a disability would take up employment if working from home most of the week was offered (Colmar Brunton Research and Deloitte Access Economics 2012).

Working from home, along with other flexible work arrangements, is often cited as a way of increasing opportunities for workers who have traditionally found labour market participation difficult. Diversity Council Australia explained in their submission to the Australian Human Rights Commission's inquiry, *Willing to Work: National Inquiry into Employment Discrimination against Older Australians and Australians with Disability*, that:

As knowledge based work increases, and the technologies enabling home-based work improve, there is ever increasing opportunity for employers to tap into the currently untapped market of talented people with disability and other employees who wish to work flexibly. (2015, p. 10)

This was echoed by the Hon Susan Ryan AO, Human Rights Age and Disability Discrimination Commissioner.

It is clear that more access to flexible working arrangements would help keep people with caring responsibilities connected to the workforce. (AHRC 2016)

The Workplace Gender Equality Agency (WGEA) also advocates for flexible working arrangements, including working from home, as a key enabler of a more equal gender balance in the workforce — access to flexible remote working arrangements is a key requirement of the WGEA's 'Employer of Choice for Gender Equality' award (WGEA 2021). As noted in chapter 3, the WGEA compiles data on private sector firms' flexible working policies and strategies (as well as whether employers have set specific targets for men's engagement with flexible working) as part of its reporting role under the *Workplace Gender Equality Act 2012* (Cth).

### **... but may also exacerbate inequality in other ways**

The ability to work from home not only provides certain groups with more options for entering the workforce, it is also associated with improved job satisfaction (Gajendran and Harrison 2007), though the relationship depends on the amount of worked carried from the home (Allen, Golden and Shockley 2015). This is mainly due to a greater sense of autonomy over task selection, and/or control over one's schedule (Gajendran and Harrison 2007; Golden, Veiga and Simsek 2006). Conversely, excessive monitoring of working from home can raise privacy concerns and decrease organisational attachment (Jeske and Santuzzi 2013).

However, working from home has some potential to limit career progress. Research from before the pandemic from employees in call centres found that the promotion rate of home-based employees fell despite them being more productive than employees working from a common location (Bloom et al. 2015; Emanuel and Harrington 2021). Factors contributing to the disadvantage experienced by people working from home included:

- missing out on unplanned face-to-face interactions with decision makers (Beauregard, Basile and Canonico 2019; Booker 2021; Taylor 2021), particularly when people worked from home intensively (more than 2.5 days per week) (Gajendran and Harrison 2007)
- being 'out of sight, out of mind' (McCloskey and Igbaria 2003; Weinert, Maier and Laumer 2015)
- the stigmatised view that working from home is a form of shirking. This view may have abated with the widespread adoption of working from home during the pandemic (Barrero, Bloom and Davis 2021; Taneja, Mizen and Bloom 2021).

Given that, prior to the pandemic, women in Australia tended to work from home slightly more than men, and that they have greater potential to work from home, this could counter the ability of working from home to promote gender equality in the workforce.

Men and women ... need to have equal access and equal success in working flexibly, without negative judgements or repercussions for their career progression. (Sanders et al. 2016)

Employers who want to adopt work-from-home models may take a proactive approach to address cultural biases within their existing workforce. Businesses that *enable* working from home, but *prioritise* a physical presence in the centralised workplace, could risk disadvantaging people who choose to work from home in terms of training, career development and access to promotion opportunities. Employers wishing to avoid this may consider consciously implementing a 'remote first' approach to work systems, such that physical presence in the centralised workplace does not confer significant additional benefits (Murph, Reeder and Bula 2021). A culture of trust between managers and employees increases employees' confidence that their career opportunities will not diminish (Nakrošienė, Bučiūnienė and Goštautaitė 2019) and will encourage workers to perform well when working from home (Beauregard, Basile and Canonico 2019). Employers may also need to adapt management approaches that have traditionally relied on having employees in a centralised location (chapter 2).

### 5.3 What does this all mean for wellbeing?

On balance, there is no strong indication of an increased risk to wellbeing for employees who chose to work from home before the pandemic. But people's experiences were diverse, with evidence of different effects for males and females and across age groups.

Survey evidence suggests that many people who worked from home during the pandemic had a positive experience (Beck and Hensher 2021). They learned to value the flexibility and time savings associated with working from home, although wellbeing was offset by decreases in in-office sociability. On the other hand, some stakeholders and commentators have pointed to downsides, such as:

- employees working longer than planned (ACTU 2020; Nahum 2020)
- employees working at times that would usually be recreational (Li et al. 2020; Oakman et al. 2020), leading to longer workdays. According to an international analysis of workers' digital communication

patterns during 2020 lockdowns, the length of the average workday increased by around 8.2%, or almost 49 minutes, relative to pre-pandemic levels (DeFilippis et al. 2020)<sup>12</sup>

- Loneliness, anxiety and depression (Mattey et al. 2020a).

Some of this evidence is from a period when people were working from home under stay-at-home orders, meaning that employees had limited opportunities to socialise and children could not physically attend school and, in some instances, childcare. These circumstances imposed substantial additional demands on people than would normally be the case, with implications for their wellbeing. As the second wave of experimentation unfolds, some of these downside effects of working from home could be mitigated by the following factors.

- **Learning.** The diversity of home-based arrangements in the second wave of experimentation, ranging from one to five days per week, occurring simultaneously across many firms will accelerate learning for employees and employers. Part of that learning involves how to overcome some of the risks to wellbeing which can come from remote work.
- **Frequency.** Some of that learning is already reflected in employees preferences for hybrid arrangements, which allows them to balance the benefits of working from home with any potential downsides concerning their family life, health and career. A study summarising the experiences of working from home prior to the pandemic indicates that the presence and intensity of various effects is contingent on the proportion of work done from home (Gajendran and Harrison 2007).
- **Choice.** Employees who eventually conclude that their current working from home arrangements are unsuitable may negotiate an adjustment in the number of days in the office with their existing employer, or otherwise switch jobs. There is evidence to suggest that being able to exercise choice and autonomy over their working arrangements drives most of the benefits of working from home (Eurofound and ILO 2017; Karanikas and Cauchi 2020) including on increased productivity and improved job satisfaction (Allen, Golden and Shockley 2015; Bloom et al. 2015; Gajendran and Harrison 2007).

The relevance of these three elements in determining the success of working from home is highlighted in the research by Bloom et al. (2015), who led a randomised control trial of call-centre employees in a Chinese travel company. At the end of the experiment, in which workers had worked from home most of the week over many months, over half the workers chose to return to the office, in part because they were lonely.

In the longer term, more workers are expected to work from home than prior to the pandemic. These workers may be different to those who worked from home before the pandemic across a number of dimensions such as age, marital status, caring responsibilities and hours worked (chapter 1). Some may simultaneously experience both positive and negative effects due to working from home, reflecting the diversity of circumstances, preferences and coping mechanisms across the working population.

Hence it will be important for firms, employees and governments to monitor these issues, particularly if working from home continues to grow. On the whole, the nature of economic progress suggests that we will continue to capture the benefits of working from home while finding new ways to mitigate the costs.

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<sup>12</sup> The workday is defined as the span of time between the first and last email sent or meeting attended in a 24-hour period. It does not account for time spent not working within that span.

# Appendices



# A. Conduct of this research

## A.1 Consultations

The Commission held meetings and a roundtable with a range of individuals, firms, industry bodies, and government agencies (tables A.1 and A.2). The Commission is grateful to those organisations and people, as well as a number of people within the Commission, for their time and their willingness to share their knowledge and experiences in support of this work.

**Table A.1 Consultations**

### Participants

Australian Chamber of Commerce and Industry

Australian Government Department of Treasury

Australian Public Service Commission

Ai Group

Atlassian

Bardoel, Anne (Swinburne University of Technology)

Barrero, Jose Maria (Instituto Tecnológico Autónomo de México (ITAM), Stanford)

Borland, Jeff (University of Melbourne)

Comcare

Fair Work Commission

Gitlab

NSW Innovation and Productivity Council

NSW Treasury

Telstra

Victorian Aboriginal Child Care Agency

Victorian Public Sector Commission

**Table A.2 Roundtable participants**

Organisation	Participant
Australian Chamber of Commerce and Industry	Ross Lambie
Australian Council of Trade Unions	Geoff Derrick
Australian Human Resources Institute; PwC	Ben Hamer
Australian Institute of Family Studies	Jennifer Baxter
Centre for Future Work (Australia Institute)	Jim Stanford
Curtin University	Mike Dockery
Fair Work Ombudsman	Anthony Fogarty
Grattan Institute	Danielle Wood
Innovation and Productivity Council (NSW Treasury)	Brendan Elliot
Melbourne Institute of Applied Economic and Social Research	Jordy Meekes
Swinburne University	Anne Bardoel
Swinburne University	John Hopkins
Safe Work Australia	River Paul
Safe Work Australia	Katherine Taylor
University of Sydney	Matthew Beck

## A.2 Data use

The study uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this study, however, are those of the Commission and should not be attributed to either DSS or the Melbourne Institute.



## B. A simple model of working from home

An illustrative working-from-home model provides insights into how access to work from home might change people's labour supply decisions and what factors will influence the extent of those changes. The model is necessarily an imperfect representation of a complex interaction between employers and employees, but yields useful insights. This appendix briefly outlines the model (section B.1). The model is then used as the basis of a simulation exercise (section B.2) which explores its implications.

These implications are summarised into three key insights which are discussed in section B.3.

1. Increased access to work from home would be expected to increase labour supply. The increase is likely to be larger for individuals with longer relative commutes, as the time saved from commuting can be distributed between work and non-work activities, based on the preferences of the individual. The labour supply increase would be expected to be largest among those people who have a stronger preference for work from home (for example, people with caring responsibilities, secondary earners in family households, and people with disabilities). If the productivity of home-based work increases (relative to office-based work), proportion of hours worked at home would also likely increase.
2. The commute is a time cost that could be better allocated to other activities. Because working from home allows individuals to avoid the commute it constitutes a weak Pareto improvement. Time otherwise spent commuting can be distributed between paid and unpaid activities, meaning that access to work from home unambiguously increases individual utility. Because some of the reclaimed commuting time is devoted to work, the firm is at least as well off as before. This makes working from home beneficial for employers and employees.
3. Flexible wages yield better outcomes for everyone. If wages can adjust to reflect the location of work — that is, wages are allowed to differ according to whether work is done at home or in a common location— then this allows for an optimal outcome for a wider range of individuals and firms.

### B.1 The basic model

The model is a single period, two-sided (individual and firm) problem that assumes the location of work is important to decisions made by individuals and firms. Work can be done in one of two locations: in the 'office', which represents typical centralised workplaces, or at 'home'. There are two agents in the model representing typical decision makers in the economy:

1. the individual (employee), who is assumed to maximise utility and supply labour
2. the firm (employer), who is assumed to maximise profit and demand labour.

The agents are a stylised representation of the aggregation of heterogenous employers and employees in the market. The model extends the standard consumption vs unpaid hours decision faced by individuals to include individual preferences for working from home ('flexibility') or in the office ('social interaction').

When individuals work from home they save the time that would otherwise be spent commuting. It is assumed that employers only have preferences for one work location over another if the location of work affects productivity, and ultimately profits.

Both agents are price takers, accepting the market wage for labour. As a starting point, it is assumed that different wages can be paid for each type of labour. However, the discussion in section B.3 addresses what happens when wages for work performed at home and in the office are constrained to be equal.

## The firm's problem

The employer is assumed to maximise profit (total revenue minus total cost). Output is a function of two kinds of productive hours of work, work supplied from the home and work supplied from the office. This makes the profit function of the firm:

$$\pi = p \cdot f(L_h, L_o) - w^h L_h - w^o L_o$$

Where:

1.  $\pi$  is profit
2.  $p$  is the unit price of the output good
3.  $L_h$  is hours worked at home per week
4.  $L_o$  is hours worked at the office per week
5.  $w^h$  is the wage paid to labour supplied from the home
6.  $w^o$  is the wage paid to labour supplied from the office.

If we specify a constant elasticity of substitution production function we get the following maximisation problem:

$$\max_{L_h, L_o} \pi = p(\beta_{L_h} L_h^\rho + \beta_{L_o} L_o^\rho)^{\frac{1}{\rho}} - w^h L_h - w^o L_o \text{ s.t. } L_h \geq 0, L_o \geq 0$$

Where:

1.  $\beta_{L_h} \in (0,1)$  is the output parameter for hours worked at home
2.  $\beta_{L_o} \in (0,1)$  is the output parameter for hours worked at the office
3.  $\beta_{L_h} + \beta_{L_o} = 1$
4.  $\rho \in (-\infty, 1)$  is the substitution parameter, where  $\sigma = \frac{1}{1-\rho}$  is the elasticity of substitution (that is,  $\rho = \frac{\sigma-1}{\sigma}$ )
5. The production function exhibits constant returns to scale.

Which yields the Lagrangian:

$$\mathcal{L} = p(\beta_{L_h} L_h^\rho + \beta_{L_o} L_o^\rho)^{\frac{1}{\rho}} - w^h L_h - w^o L_o + \lambda_{L_h} L_h + \lambda_{L_o} L_o$$

With the following first order conditions:

$$\frac{\partial \mathcal{L}}{\partial L_h} = p\beta_{L_h} L_h^{\rho-1} (\beta_{L_h} L_h^\rho + \beta_{L_o} L_o^\rho)^{\frac{1}{\rho}-1} - w^h + \lambda_{L_h} = 0 \quad (1)$$

$$\frac{\partial \mathcal{L}}{\partial L_o} = p\beta_{L_o} L_o^{\rho-1} (\beta_{L_h} L_h^\rho + \beta_{L_o} L_o^\rho)^{\frac{1}{\rho}-1} - w^o + \lambda_{L_o} = 0 \quad (2)$$

$$\lambda_{L_h} L_h = 0$$

$$\lambda_{L_o} L_o = 0$$

If we assume that the firm is using labour from both the home and the office, and combine equations (1) and (2):

$$\frac{\beta_{L_h} L_h^{\rho-1}}{\beta_{L_o} L_o^{\rho-1}} = \frac{w^h}{w^o}$$

$$\frac{L_h}{L_o} = \left( \frac{\beta_{L_o} w^h}{\beta_{L_h} w^o} \right)^{\frac{1}{\rho-1}} \quad (a)$$

This implies that the firm's labour demand will be determined by the wage ratio, the relative productivity of home labour to office labour, and the substitutability of home and office labour.

If wages are fixed to be equal regardless of where work is performed, then the wage ratio will be 1. In this case, the distribution of labour across the two locations will be determined only by the relative marginal profit from using employees in the two locations (as determined by  $\beta_{L_o}$  and  $\beta_{L_h}$ ) and how readily the firm can substitute between them.

## The individual's problem

The individual enjoys consumption, unpaid activities, and has a preference affecting where they want to work. The preference for the location of work simply means that hours worked in the home are valued differently to hours worked in the office. Preferences for a particular location of work reflects the value of social interaction when working at the office and the value of flexibility when working at home. The individual then faces the following utility function:

$$U(C, H, L_h, L_o)$$

Where:

1.  $C$  is consumption of the individual, which includes the benefits of savings
2.  $H$  is the unpaid hours of the individual — these hours can be used for leisure, house work, extra sleep etc.
3.  $L_h$  is the hours worked at home, here it reflects a direct preference for the location of work to be the home. We assume that  $\frac{\partial U}{\partial L_h} > 0$ ,  $\frac{\partial^2 U}{\partial L_h^2} < 0$
4.  $L_o$  is the hours worked in the office, here it reflects a direct preference for the location of work to be the office. We assume that  $\frac{\partial U}{\partial L_o} > 0$ ,  $\frac{\partial^2 U}{\partial L_o^2} < 0$ .

The individual's constraints are time and consumption. The individual's time is strictly bounded, with time divided up between paid activities (work) and unpaid activities. The individual's consumption is bounded by their earnings from labour.

This set up breaks from convention as labour hours enter directly into the utility function instead of only through consumption and unpaid time. This implies that there is a positive marginal utility of labour in this model. The aim of this feature is to capture the benefits of the location of work separate to the typical trade-off between consumption and unpaid time.

Wanting more work in the office (captured by the fourth term in the utility function) is intended to represent people who get satisfaction from socialising with colleagues. Wanting more work at home (captured by the third term in the utility function) represents people who enjoy working in familiar surroundings, comfortable clothes, and being able to do home activities in between work tasks.

We impose the restriction that  $\frac{\partial U}{\partial H} > \frac{\partial U}{\partial L_o}$  and  $\frac{\partial U}{\partial H} > \frac{\partial U}{\partial L_h}$  for all values of  $L_o$  and  $L_h$  below  $\bar{T}$ , so that the preference for a certain type of work is not so strong that the worker would agree to work for free (or a negative wage).

The unpaid hours constraint is:

$$H = \bar{T} - L_h - (1 + t)L_o$$

Where:

1.  $\bar{T}$  is the total work week time endowment
2.  $t$  is the fixed length of commute expressed as a fraction of hours spent at the office.

For the individual income constraint, we assume no savings, so income ( $Y$ ) is equal to consumption ( $C$ ):

$$Y = C = w^h L_h + w^o L_o$$

This gives the following maximisation problem:

$$\begin{aligned} & \max_{C, H, L_h, L_o} U(C, H, L_h, L_o) \\ & s. t. \quad H + L_h + L_o + tL_o \leq \bar{T} \\ & \quad C \leq w^h L_h + w^o L_o \\ & \quad L_h \geq 0, L_o \geq 0 \end{aligned}$$

Substituting the constraints into the utility function yields:

$$\mathcal{L} = U(w^h L_h + w^o L_o, \bar{T} - L_h - (1 + t)L_o, L_h, L_o) + \lambda_{L_h} L_h + \lambda_{L_o} L_o$$

We assume that an interior solution exists in which the individual wants to work a positive number of hours, and have some positive number of unpaid hours, which holds if  $\lim_{C \rightarrow 0} \frac{\partial U}{\partial C} = \infty$  and  $\lim_{H \rightarrow 0} \frac{\partial U}{\partial H} = \infty$ .

This formulation allows for the possibility that the employee could choose to work almost all of their hours at the office, or almost all of their hours at home. If a positive number of hours are worked at home, then the parameter  $\lambda_{L_h} = 0$ , and if a positive number of hours are worked at the office, then the parameter  $\lambda_{L_o} = 0$ .

Taking first order conditions (assuming an interior solution) with respect to  $L_h$  and  $L_o$  yields:

$$\frac{\partial \mathcal{L}}{\partial L_h} = \frac{\partial U}{\partial C} w^h - \frac{\partial U}{\partial H} + \frac{\partial U}{\partial L_h} + \lambda_{L_h} = 0 \quad (3)$$

$$\frac{\partial \mathcal{L}}{\partial L_o} = \frac{\partial U}{\partial C} w^o - \frac{\partial U}{\partial H} \cdot (1 + t) + \frac{\partial U}{\partial L_o} + \lambda_{L_o} = 0 \quad (4)$$

$$\lambda_{L_h} L_h = 0, \quad L_h \geq 0$$

$$\lambda_{L_o} L_o = 0, \quad L_o \geq 0$$

Equations (3) and (4) imply that as the marginal utility of consumption  $\left(\frac{\partial U}{\partial C}\right)$  increases, the labour supplied from both home and office will increase, assuming  $L_o > 0$  and  $L_h > 0$ . Conversely, as the marginal utility of unpaid hours  $\left(\frac{\partial U}{\partial H}\right)$  increases, labour supplied from the home and office will decrease.

Equations (3) and (4) also show that the longer it takes for employees to commute to and from the office — that is, as  $t$  increases — the larger is  $\frac{\partial U}{\partial L_o}$  (holding other things constant) and the smaller is  $\frac{\partial U}{\partial L_h}$ , meaning more time will be spent at home.<sup>13</sup> Even if the wages for home and office work are identical, there could be an interior solution, depending on the values of social interaction and avoiding the commute.

<sup>13</sup> Remembering that a low marginal utility of labour reflects a high level of labour.

If we specify a constant elasticity of substitution utility function (without substituting the constraints into the utility function), the maximisation problem becomes:

$$\mathcal{L} = (\alpha_C C^r + \alpha_H H^r + \alpha_{L_h} L_h^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}} + \lambda_H (-H - L_h - L_o - tL_o + \bar{T}) + \lambda_C (w^h L_h + w^o L_o - C) + \lambda_{L_h} L_h + \lambda_{L_o} L_o$$

Where:

1.  $\alpha_C \in (0,1)$  is the preference parameter for consumption
2.  $\alpha_H \in (0,1)$  is the preference parameter for unpaid hours
3.  $\alpha_{L_h} \in (0,1)$  is the preference parameter for hours worked at home
4.  $\alpha_{L_o} \in (0,1)$  is the preference parameter for hours worked at the office
5.  $\alpha_C + \alpha_H + \alpha_{L_h} + \alpha_{L_o} = 1$
6.  $r \in (-\infty, 1)$  is the substitution parameter, where  $s = \frac{1}{1-r}$  is the elasticity of substitution
7. The utility function exhibits constant returns to scale.

Which yields the following first order conditions:

$$\frac{\partial \mathcal{L}}{\partial C} = \alpha_C C^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_h} L_h^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_C = 0 \quad (5)$$

$$\frac{\partial \mathcal{L}}{\partial H} = \alpha_H H^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_h} L_h^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_H = 0 \quad (6)$$

$$\frac{\partial \mathcal{L}}{\partial L_h} = \alpha_{L_h} L_h^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_h} L_h^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_H + \lambda_C w^h + \lambda_{L_h} = 0 \quad (7)$$

$$\frac{\partial \mathcal{L}}{\partial L_o} = \alpha_{L_o} L_o^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_h} L_h^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_H (1+t) + \lambda_C w^o + \lambda_{L_o} = 0 \quad (8)$$

$$\frac{\partial \mathcal{L}}{\partial \lambda_H} = H + L_h + L_o + tL_o - \bar{T} = 0$$

$$\frac{\partial \mathcal{L}}{\partial \lambda_C} = w^h L_h + w^o L_o - C = 0$$

$$\lambda_H \geq 0, \quad \lambda_C \geq 0, \quad \lambda_{L_h} \geq 0, \quad \lambda_{L_o} \geq 0$$

$$\lambda_H (H + L_h + L_o + tL_o - \bar{T}) = 0, \quad \lambda_C (w^h L_h + w^o L_o - C) = 0,$$

$$\lambda_{L_h} L_h = 0, \quad \lambda_{L_o} L_o = 0$$

The section below considers these first order conditions when the individual can and cannot work from home. When the individual does not have the option to work from home, the maximisation problem for the firm and individual would need to be modified so that the firm and individual do not have the option to choose  $L_h$ . These maximisation problems have not been written out for the sake of brevity.

### Equilibrium conditions when working from home is permitted ('work from home')

The first order conditions of the individual's maximisation problem help us understand how parameters of the model affect equilibrium levels of paid and unpaid hours when individuals can and cannot work from home. Focusing on the range of values for which workers want to work a positive amount from home and from the office ( $\lambda_{L_h} = 0, \lambda_{L_o} = 0$ ), we use (5) and (6) to substitute  $\lambda_H$  and  $\lambda_C$  out of equations (7) and (8):

$$\alpha_{L_h} L_h^{r-1} - \alpha_H H^{r-1} + w^h \alpha_C C^{r-1} = 0 \quad (7')$$

$$\alpha_{L_o} L_o^{r-1} - (1+t) \alpha_H H^{r-1} + w^o \alpha_C C^{r-1} = 0 \quad (8')$$

Combining (7') and (8') to eliminate  $H$  yields:

$$\begin{aligned}\alpha_{L_o} L_o^{r-1} - (1+t)\alpha_{L_h} L_h^{r-1} + w^o \alpha_C C^{r-1} - (1+t)w^h \alpha_C C^{r-1} &= 0 \\ \alpha_{L_o} L_o^{r-1} - (1+t)\alpha_{L_h} L_h^{r-1} &= ((1+t)w^h - w^o)\alpha_C C^{r-1}\end{aligned}$$

Replacing  $C$  with its value in terms of  $L_o$  and  $L_h$  from the income equation yields:

$$\begin{aligned}\alpha_{L_o} L_o^{r-1} - (1+t)\alpha_{L_h} L_h^{r-1} &= ((1+t)w^h - w^o)\alpha_C (w^h L_h + w^o L_o)^{r-1} \\ \alpha_{L_o} - (1+t)\alpha_{L_h} \left(\frac{L_h}{L_o}\right)^{r-1} &= ((1+t)w^h - w^o)\alpha_C \left(w^h \frac{L_h}{L_o} + w^o\right)^{r-1}\end{aligned}\quad (b)$$

This (b) function implicitly defines the  $\frac{L_h}{L_o}$  ratio. In particular:

- if  $w^o = (1+t)w^h$  (i.e. the office wage and the home wage are identical, after adjusting for the cost of travel), then  $L_h = L_o \left(\frac{(1+t)\alpha_{L_h}}{\alpha_{L_o}}\right)^{\frac{1}{1-r}}$  and the utility of consumption  $\alpha_C$  does not affect the relative proportions of home and office work. Increasing the fixed commute length will shift work towards the home
- $w^o > (1+t)w^h$  (i.e. the office wage is higher), then  $L_h < L_o \left(\frac{(1+t)\alpha_{L_h}}{\alpha_{L_o}}\right)^{\frac{1}{1-r}}$  and  $L_h$  is a smaller share as the utility of consumption  $\alpha_C$  is larger.  $L_h$  becomes a smaller share of labour as the utility of consumption increases because  $L_o$  will grow faster than  $L_h$  (because of the relatively higher returns to  $L_o$ ).
- $w^o < (1+t)w^h$  (i.e. the office wage is lower), then  $L_h > L_o \left(\frac{(1+t)\alpha_{L_h}}{\alpha_{L_o}}\right)^{\frac{1}{1-r}}$  and  $L_h$  is larger as the utility of consumption  $\alpha_C$  is larger.
- Intuitively,  $\frac{L_h}{L_o}$  increases with  $\alpha_{L_h}$  and decreases with  $\alpha_{L_o}$ .

## Equilibrium conditions when working from home is not permitted ('no work from home')

Before 2020, most offices did not allow many workers the option of regularly working from home. In that state of the world, which we will describe as 'no work from home', if  $L_h = 0$  and  $L_o > 0$ , the optimisation conditions are:

$$\frac{\partial \mathcal{L}}{\partial C} = \alpha_C C^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_C = 0 \quad (9)$$

$$\frac{\partial \mathcal{L}}{\partial H} = \alpha_H H^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_H = 0 \quad (10)$$

$$\frac{\partial \mathcal{L}}{\partial L_o} = \alpha_{L_o} L_o^{r-1} (\alpha_C C^r + \alpha_H H^r + \alpha_{L_o} L_o^r)^{\frac{1}{r}-1} - \lambda_H (1+t) + \lambda_C w^o = 0 \quad (11)$$

$$\frac{\partial \mathcal{L}}{\partial \lambda_H} = H + L_o + tL_o - \bar{T} = 0 \quad (12)$$

$$\frac{\partial \mathcal{L}}{\partial \lambda_C} = w^o L_o - C = 0 \quad (13)$$

Using (9) and (10) to substitute  $\lambda_H$  and  $\lambda_C$  out of equation (11) yields:

$$\alpha_{L_o} L_o^{r-1} - (1+t)\alpha_H H^{r-1} + w^o \alpha_C C^{r-1} = 0$$

Using (12) and (13) to substitute out  $H$  and  $C$  and solve for  $L_o$  yields:

$$\alpha_{L_o} L_o^{r-1} - (1+t)\alpha_H (\bar{T} - (1+t)L_o)^{r-1} + w^{or} \alpha_C L_o^{r-1} = 0$$

Re-arranging:

$$\left( \frac{(1+t)\alpha_H}{\alpha_{L_o} + w^{o^r}\alpha_C} \right)^{\frac{1}{1-r}} + (1+t) = \frac{\bar{T}}{L_o}$$

Solving for  $L_o$  yields:

$$L_o = \frac{\bar{T}}{\left( \frac{(1+t)\alpha_H}{\alpha_{L_o} + w^{o^r}\alpha_C} \right)^{\frac{1}{1-r}} + (1+t)}$$

Intuitively, labour supply to the office is high when  $\alpha_C$  is high, when  $\alpha_{L_o}$  is high, when the wage is high, when  $\alpha_H$  is low, or  $t$  is low.

## B.2 Simulation setup

To explore the implications of a range of equilibrium outcomes given specific parameter values of the model, simulations were run using the General Algebraic Modelling System (GAMS) software. GAMS was used to program and solve the optimisation problem for a range of parameter values.

The simulations were done using the first order conditions in equations (1), (2), (5), (6), (7), (8) and their respective constraints (unless otherwise stated).

The default set of parameters used in simulations are described in table B.1. A slightly higher preference for unpaid hours than consumption is chosen because of the specification of the utility function. The direct entry of labour into the utility function will otherwise skew preferences towards more work creating unintuitive patterns of substitution. The fixed commute length of  $t = 0.125$  was chosen as it represents a 1 hour total commute for an 8 hour work day. Labour was set to be equally productive in both locations by default. Substitution parameters were chosen so that the degree of substitutability between inputs is higher than the degree of complementarity. Total time endowment was set to  $\bar{T} = 80$  as this represents the total number of hours in the 5 work week days (assuming individuals sleep for 8 hours per night).

**Table B.3** Default parameter settings for simulations

$\alpha_C$	0.47
$\alpha_H$	0.49
$\alpha_{L_h}$	0.02
$\alpha_{L_o}$	0.02
$t$	0.125
$\beta_{L_h}$	0.5
$\beta_{L_o}$	0.5
$s$ (individual)	2
$\sigma$ (firm)	2
$\bar{T}$	80

## B.3 Model results

### Working from home leads to increased labour supply

A number of factors influence how much people would choose to work at home or in the office if the choice was entirely theirs. Broadly, these can be summarised as:

- the trade off between the time people have for themselves, family and friends
- the consumption they get from the income earned through work
- any additional wellbeing benefits (such as social interaction) or costs (such as stress or effort) associated with that work.

Ultimately, individuals must decide how to allocate their finite weekly hours between different activities.

When work is constrained to the office, people's labour supply decisions are more straightforward but less flexible. For those who would work, travel time is a necessary cost of getting to the workplace and an unavoidable ingredient to obtaining income for consumption. But the commute is time spent neither working nor on leisure/home production, and is lost.

Figure B.1 shows a simulation where only the individual's maximisation problem was considered. It shows the number of hours the individual is willing to work for a given wage and set of preference parameters when the commute length is varied. The parameters are set as shown in section B.2 and both wages set to 1 — that is,  $w^o = w^h = 1$ . Then the value for  $t$  is varied, indicating how a change in the individual's fixed commute length will, holding all other variables constant, affect their labour supply.

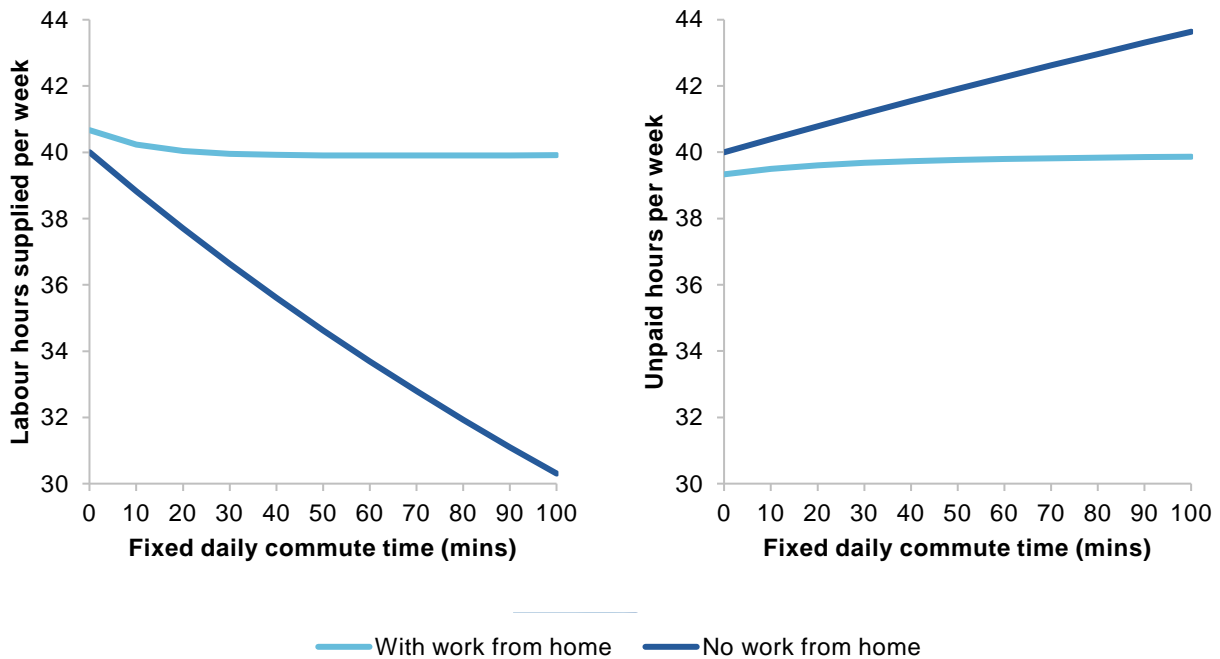
The dark blue line shows the outcome when working from home is not available. This is imposed using an additional constraint (not included in the first order conditions and formulation above, for simplicity). That additional constraint will have its own Lagrange multiplier. The individual would like to choose to work from home, but the additional constraint prevents it. The light blue line shows when this constraint is removed and working from home is made possible.

The small difference between the two curves at zero commute is due to the small degree of complementarity between home and office work in the utility function. Intuitively, the complementarity between home and office labour implies that an individual would get a higher payoff from devoting 15 hours to home labour and 15 hours to office labour than they would get from devoting all 30 hours to either one. This complementarity could be thought of as reflecting a preference for hybrid working arrangements.

As the fixed length of the commute increases, it becomes more costly to go into the office. Individuals who can work from home substitute more labour hours into home-based work and their overall labour supply changes very little. However, individuals without the option to work from home substitute work hours for unpaid hours and overall labour supply decreases. Because wages are fixed in this scenario, the utility of the individual who cannot work from home decreases as the commute gets longer, whereas the utility for the home-based worker does not change.



**Figure B.12 – Allowing home-based work increases the supply of labour — especially with longer commute times<sup>a</sup>**



a. The values on the horizontal axis represent  $t = \{0, 0.02, 0.04, \dots, 0.18\}$ , noting that  $t$  is the fixed length of the commute per hour worked, but is only incurred when the person works in the office. So if we assume that a person who works in the office does so for 8 hours, then a commute length of  $t = 0.02$  represents a fixed commute length of 9.6 minutes (rounded to 10).

### Labour supply increases are largest for those with the strongest attachment to the home

People's preferences are an important factor influencing their attitude toward work. In this model the individual trades off between consumption and unpaid hours as well as between office-based and home-based work.

In determining labour supply, people consider the importance of time spent not working compared to consumption and paid work. These preferences are reflected in their utility weights on unpaid hours and consumption,  $\alpha_H$  and  $\alpha_C$ , respectively. For example, people with a relative preference for more non-work time ( $\alpha_H > \alpha_C$ ) even if it means lower income, might have carer responsibilities.

At the same time, the individual will consider how much they want to work at home relative to the office. People with a higher utility weight for home labour than office labour ( $\alpha_{L_h} > \alpha_{L_o}$ ), are people who would prefer more of their work time to be at home. This could include people with disabilities that make workplace attendance challenging, or people who appreciate the flexibility to substitute between unpaid home production and paid work.

Figure B.2 is similar to figure B.1 in that it shows only the individual's optimal conditions without considering the demand for labour (wages are once again fixed to be equal to 1). It shows how much an individual's labour supply increases when work from home is made available for people with varying relative preferences for home labour versus office labour.

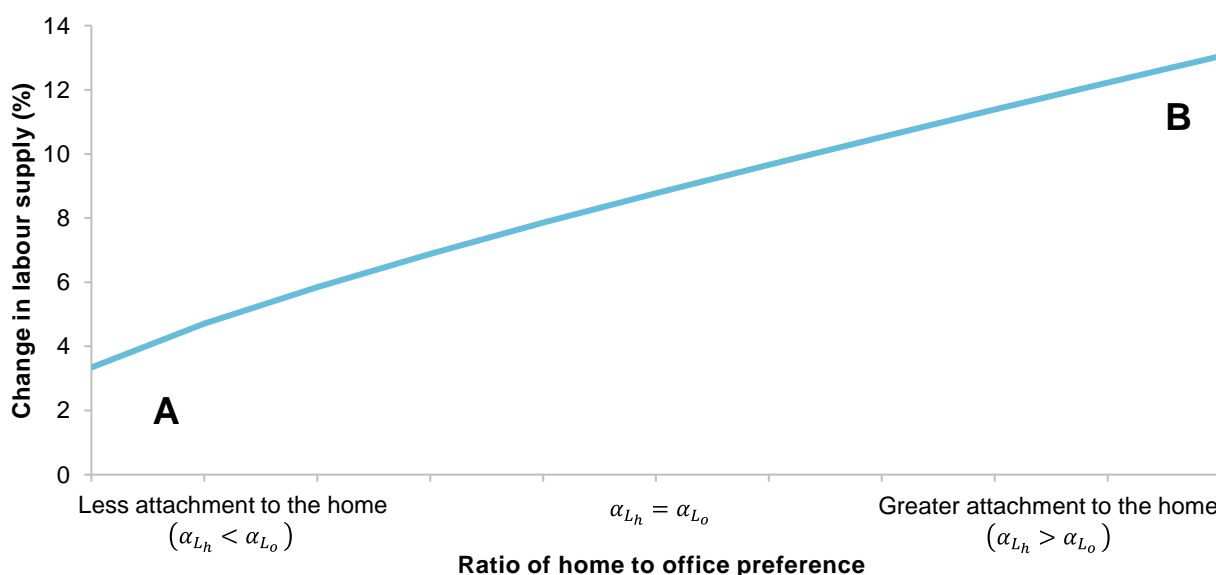
People who prefer office-based work (or actively dislike work from home) will not substantially change their work location decision when home-based work is made available (point A on figure B.2). This means that the

option to work from home will not increase their labour supply by very much for a given wage. This also limits their welfare gain as they do not save much time from avoiding the commute.

However, as people’s relative preference for home-based work increases, the effect of being able to work from home increases their labour supply response. They increase their number of hours worked by a greater percentage (as shown in figure B.2 comparing the curve at point A to point B). This also means people with these preferences receive the greatest increase in their welfare.

**Figure B.13 – Those with the strongest attachment to the home will have the biggest labour supply response**

**Comparing labour supply with working from home to no working from home<sup>a</sup>, at different levels of preference for home work<sup>b</sup>**



a. This measures the difference in total labour supply when there is no working from home to when there is working from home b. This measures the relative direct preference of home to office work, i.e.  $\alpha_{L_h}/\alpha_{L_o}$ . Specifically, the horizontal axis shows the relative preference for location of labour, where ‘less attachment to the home’ indicates  $\alpha_{L_h} < \alpha_{L_o}$  and strong attachment to the home indicates  $\alpha_{L_o} < \alpha_{L_h}$ .

This higher level of labour supply for people with a larger  $\frac{\alpha_{L_h}}{\alpha_{L_o}}$  is the result of a greater desire to work at home, rather than a desire to work more to get more consumption.

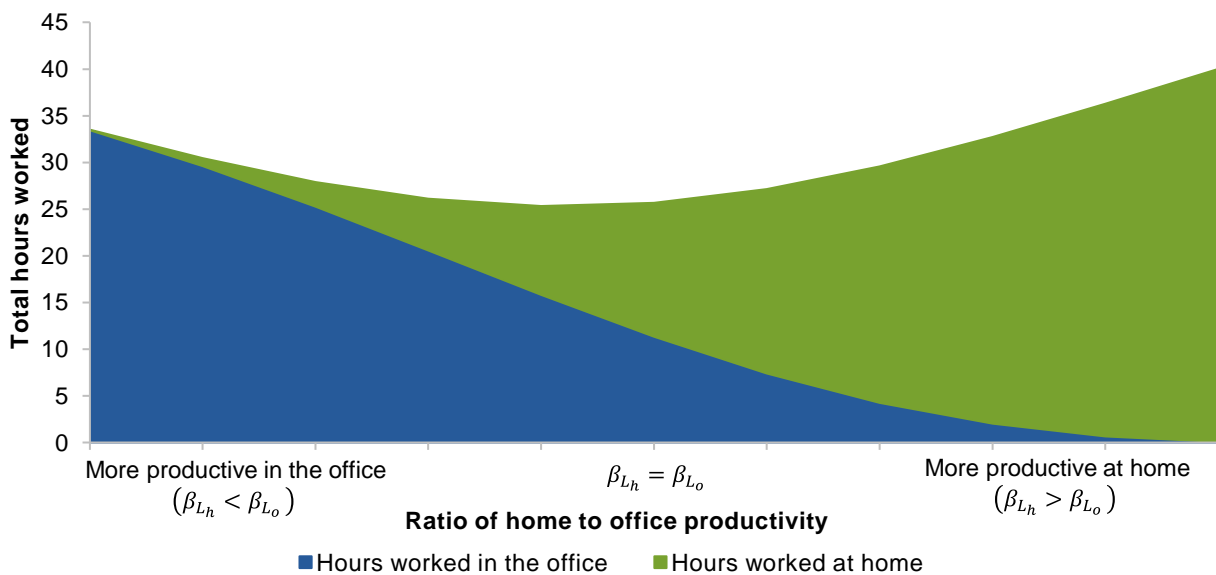
**Improved productivity of home-based work will increase demand for home-based labour**

If we consider the firm and the individual together, then the total amount of labour traded in the market will also be determined by the marginal productivity of labour. As the relative productivity of home-based work increases, employers will have a greater willingness to make use of it, with flow-on implications for individuals.

Figure B.3 shows how changes in the productivity of working from home relative to working in the office relates to the total number of hours worked. It shows that, if firms observe increased productivity in home-based work, they will be more willing to scale up the share of work hours that are from the home, even when home-based work remains less productive than office-based work.

The largest amount of labour is traded in the market when home-based production is much more productive than office-based production. However, when the firm’s office productivity is similar to the productivity of home-based labour there is a lower level of labour traded than when the firm specialises in either home or office-based technology. This is because the relative increase in wages paid to home labour does not entice the individual to work more at home than they work less in the office. Instead, they substitute much of their saved time to unpaid hours.

**Figure B.14 – Firms will adopt more home-based work as its relative productivity improves<sup>a</sup>**



a. The horizontal axis shows the relative weights on home and office labour in the production function.

In the figure above, the values on the horizontal axis indicate various ratios of home to office productivity (i.e.  $\frac{\beta_{L_h}}{\beta_{L_o}}$ ). How this ratio affects the firm’s labour demand can be seen in equation (a), reproduced below.

$$\frac{L_h}{L_o} = \left( \frac{\beta_{L_o} w^h}{\beta_{L_h} w^o} \right)^{\frac{1}{\rho-1}}$$

Remembering again that  $\rho \in (-\infty, 1)$ , this shows that, holding all other variables constant, an increase in the ratio of home to office productivity  $\left(\frac{\beta_{L_h}}{\beta_{L_o}}\right)$  will lead to an increase in the ratio of home-based to office-based work. When home-based work is substantially more productive, overall labour traded is higher. This is because the commute is being avoided by the individual and they have more time overall.

There are a number of factors which could influence the equilibrium outcome between employees and employers, which are not captured in the stylised model framework used to produce figure B.3. For example, the unconstrained version of the model implies that the equilibrium ratio of office to home labour hours will be jointly determined by the preferences of the individual and the production and cost functions of the firm. In reality, equilibrium working arrangements are more likely to be determined by relative bargaining power — often with the firm setting a ‘work from home’ policy for employees to follow. This is discussed in the last section of this appendix titled ‘Flexible wages produce a better range of outcomes’.

## The commute can be seen as a cost

Overall labour supply increases when work from home becomes an option because the commute can be avoided. In this model, the commute does not benefit individuals or firms, except by enabling office-based work. It is simply lost time for the individual. This may not be the case for all people — some people may get exercise from riding to work or get pleasure from reading on the train — but it is a reasonable assumption that the opportunity cost of the commute time is higher than any incidental benefit gained from it. Put another way: most people would not commute if they did not have to — they have other things they would rather do.

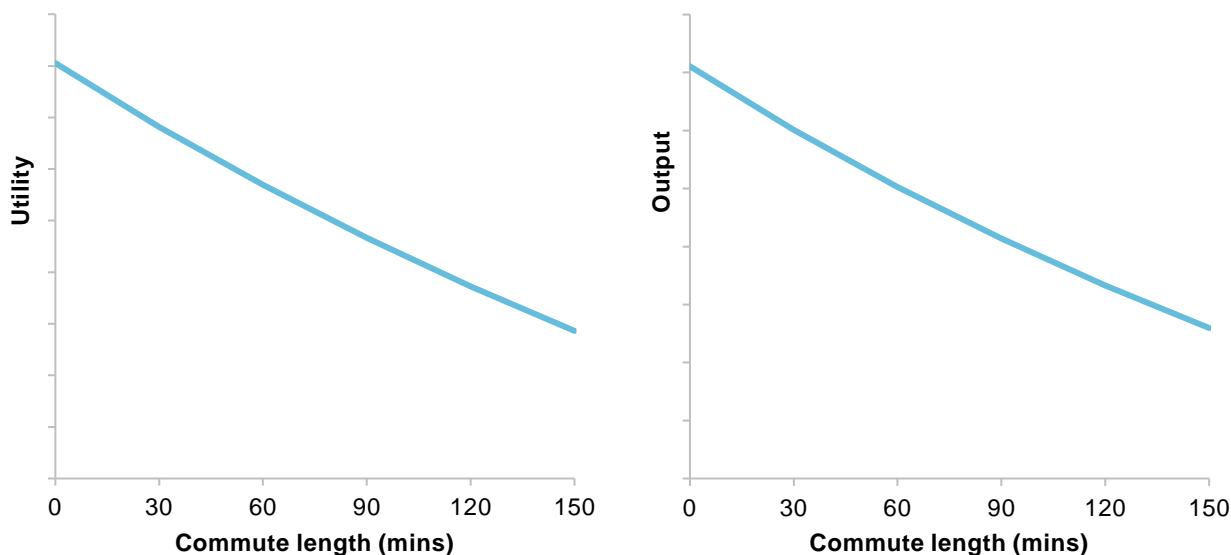
From the point of view of the individual, this is time that can be spent in paid work or unpaid activities. This division of time between these two activities is determined by the preferences of the individual as set out in the utility function.

The benefit to the firm is not explicitly captured in this model in so far as the firm is a profit maximiser with constant returns to scale technology — profits are zero in equilibrium. Allowing work from home means the individual has more time, some of which they might spend working. This means that firm output can increase through the purchase of additional labour. So, although profit remains zero, the firm expands. In terms of overall welfare, this is a weak Pareto improvement — when some of the commute is avoided, the firm is at least as well off as they were before and the individual is either the same or better off.

Figure B.4 shows that as the fixed length of the commute increases, overall utility and output both decrease.

### Figure B.15 – Increases in the commute make everyone worse off

#### Utility and output both decline as commute length increases



We can see the effect of the commute on the individual's utility from the first order conditions if we consider equation (8), reproduced below.

$$\frac{\alpha_{L_o} L_o^{r-1}}{U^*} - \lambda_H(1+t) + \lambda_C w^o + \lambda_{L_o} = 0$$

$$U^* = \frac{\alpha_{L_o} L_o^{r-1}}{\lambda_H(1+t) - \lambda_C w^o - \lambda_{L_o}}$$

This shows that as the fixed length of the commute increases (the  $t$  in the denominator of the second equation), holding all else constant, utility (the left-hand side of the equation) will decrease.

A similar logic implies that higher travel times will, in all likelihood, reduce firm output. Re-expressing the equation above to have  $L_o$  on the left-hand side shows that increased travel times will reduce  $L_o$ , holding other variables constant. The corresponding re-expression of equation (7) does not contain  $t$  at all, except implicitly via the other variables. Substituting the identity for  $L_o$  and  $L_h$  into the firm's output function, it can be seen that firm output is a negative function, *ceteris paribus*, of  $t$  as well.

The corollary of the above point, is that enabling working from home makes everyone better off as the time saved from avoiding commute can be channelled into work. This effect is larger for people with longer commutes.

## Flexible wages produce a better range of outcomes

Without wages to determine the level of labour traded in the market, employers and employees must either agree how much home and office work will be done through bargaining, or the firm must set a rule and the worker must decide to take it or leave it.

In the case of bargaining, the outcome will reflect the relative level of bargaining power between employer and employee and the mechanism by which an agreement is reached. This is a complex scenario as it would either require individual bargaining, implying employees would have lower bargaining power on average, or group bargaining, which would make it hard to reflect the diverse preferences of employees.

If the firm sets the rule, then we can show that its optimal ratio of hours are unlikely to be optimal for the individual.

Consider the firm's profit maximisation problem:

$$\pi = p(\beta_{L_h} L_h^\rho + \beta_{L_o} L_o^\rho)^{\frac{1}{\rho}} - w^h L_h - w^o L_o$$

The firm is substituting between the two inputs  $L_h$  and  $L_o$ . Assume for the moment that the firm believes people are exactly as productive at home as they are in the office and intends to weight the inputs to production equally. This implies that  $\beta_{L_h} = \beta_{L_o}$ . Because the production function exhibits constant returns to scale, if the wages are forced to be equal then output would only be maximised if  $L_h = L_o$ .

We can see this if we set  $w^h = w^o$  in the firm's first order conditions. Equation (a) becomes:

$$\frac{L_h}{L_o} = \left( \frac{\beta_{L_o}}{\beta_{L_h}} \right)^{\frac{1}{\rho-1}}$$

Setting the right-hand side of the equation to 1 ( $\beta_{L_h} = \beta_{L_o}$ ) will reduce to  $L_h = L_o$ .

In practice, it is possible that, because home-based labour is a new technology, the firm believes work from home is less productive than work in the office (i.e.  $\beta_{L_h} < \beta_{L_o}$ ). In this case the firm will demand more labour hours from the office than from the home. This means the firm and employee get locked into a low work-from-home scenario.

Once the firm sets the rule, for example  $L_h = L_o$ , then the individual must supply equal amounts of office and home labour or choose to move to another firm (which in our model means exiting the labour market). Because the individual faces a more complicated maximisation problem this situation will only be utility maximising for the individual under very restrictive conditions.

If we constrain wages to be equal in the case where  $L_h = L_o$ , then there will be an implied set of parameters ( $\alpha$ 's,  $t$  and  $r$ ) that are consistent with equal labour in equilibrium. Consider the individual's utility function when we substitute the constraints into it and set wages to be equal:

$$U = (\alpha_c(wL_h + wL_o)^r + \alpha_H(\bar{T} - L_h - (1+t)L_o)^r + \alpha_{L_h}L_h^r + \alpha_{L_o}L_o^r)^{\frac{1}{r}}$$

There would be a unique set of parameters that would maximise individual utility. For example, if we compared two individuals with the same substitution parameter who differ in that one has a longer commute, they would need to have a different set of  $\alpha$ 's to achieve the same level of utility. The individual with the longer commute (i.e. larger  $t$ ) would have a ratio of  $\alpha$ 's that are shifted more towards favouring home labour, but the principle would remain the same as with the firm.

This would also be true for any different ratio of  $L_h$  and  $L_o$ . The firm would determine the ratio  $\frac{L_h}{L_o}$  given a particular set of parameters. For each ratio there will be a unique value of  $\alpha$ 's,  $t$  and  $r$  that can maximise the objective function of the individual. Considering that (certainly in the short run) the parameters are exogenous to the individual and firm, it is very unlikely that individuals and firms in the economy have the corresponding set of parameters that will maximise their respective objective functions without a price mechanism. This implies that it is unlikely that fixed wages would lead to optimal outcomes.

### ... but parameters are not fixed in the long-run

Although fixed wages may create a short-run mismatch between firms and individuals, it is possible that in practice, the  $\alpha$ 's and  $\beta$ 's may evolve over time for various reasons.

- In instances where work from home is not as productive as work done in the office (i.e. when  $\beta_{L_h} < \beta_{L_o}$ ), firms are likely to invest in order to improve home-based productivity.
- Firms that want more labour supplied from the office can also offer non-wage inducements to employees to try and increase their relative enjoyment of the office (that is increasing,  $\alpha_{L_o}$  relative to  $\alpha_{L_h}$ ). This could include investing in better office space, lunches and social events.
- Individuals who place a great value on the ability to work from home also have an incentive to increase their marginal product of home-based labour to ensure the firm demands more labour from the home. This could be achieved by undergoing training, developing good communication with managers, and minimising distractions at home.

Even with price adjustments, these changes are likely to happen over time as firms and workers experiment with working from home and develop their understanding of what works best for them. The model specified here also does not capture the sorting between heterogenous firms and individuals that we know will happen in the real world to resolve mismatches.

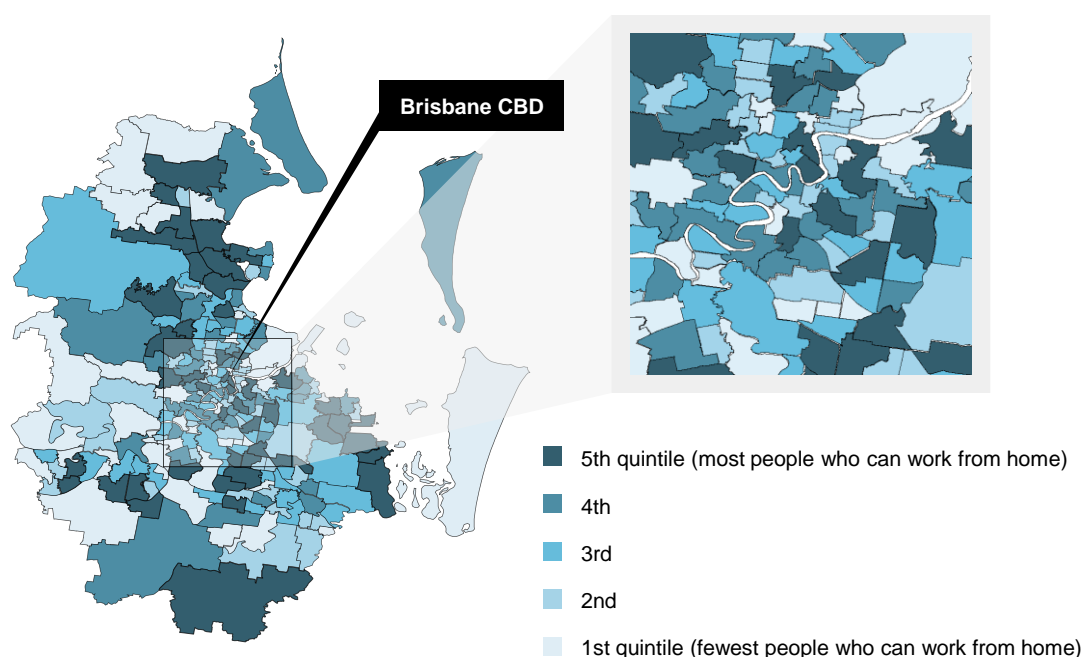
## C. Additional maps

Chapter 4 includes figures that set out the geographical distribution of people in capital cities who can work from home (figure 4.1) and the potential change in the population of different areas that may result from an increase in work from home (figure 4.2). This appendix includes figures for the capital cities not included in the chapter.

### C.1 Distribution of people who can potentially work from home in capital cities

**Figure C.16 – Brisbane<sup>a</sup>**

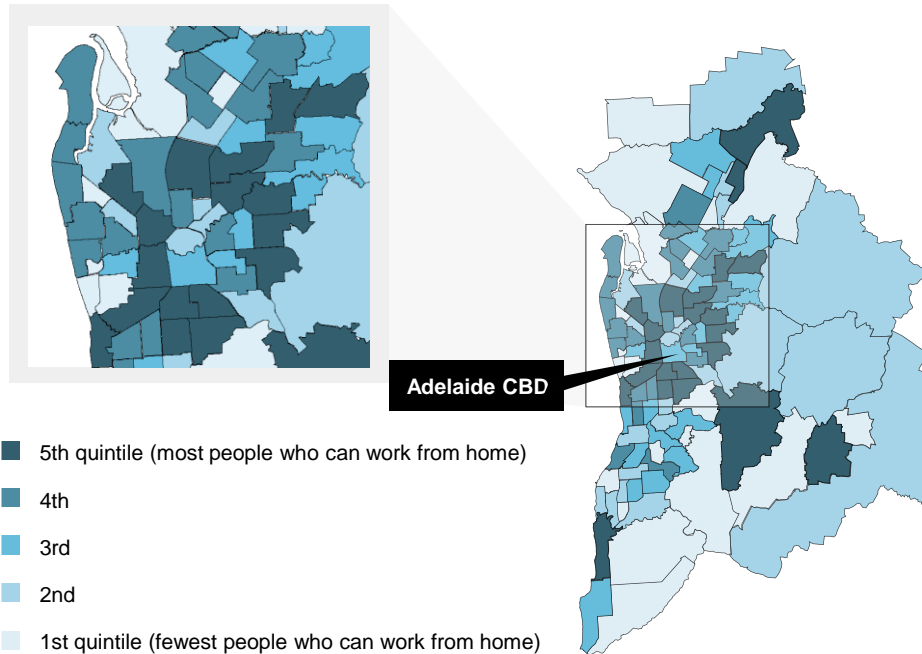
**Potential to work from home, by place of usual residence, 2016**



a. Areas are categorised into quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

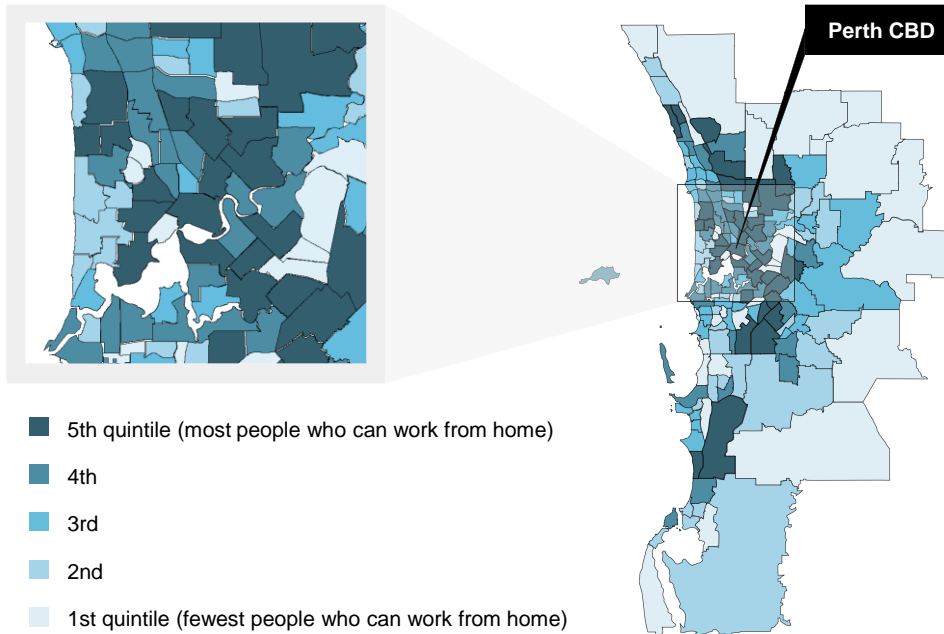
**Figure C.17 – Adelaide<sup>a</sup>**  
**Potential to work from home, by place of usual residence, 2016**



a. Areas are categorised into quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).



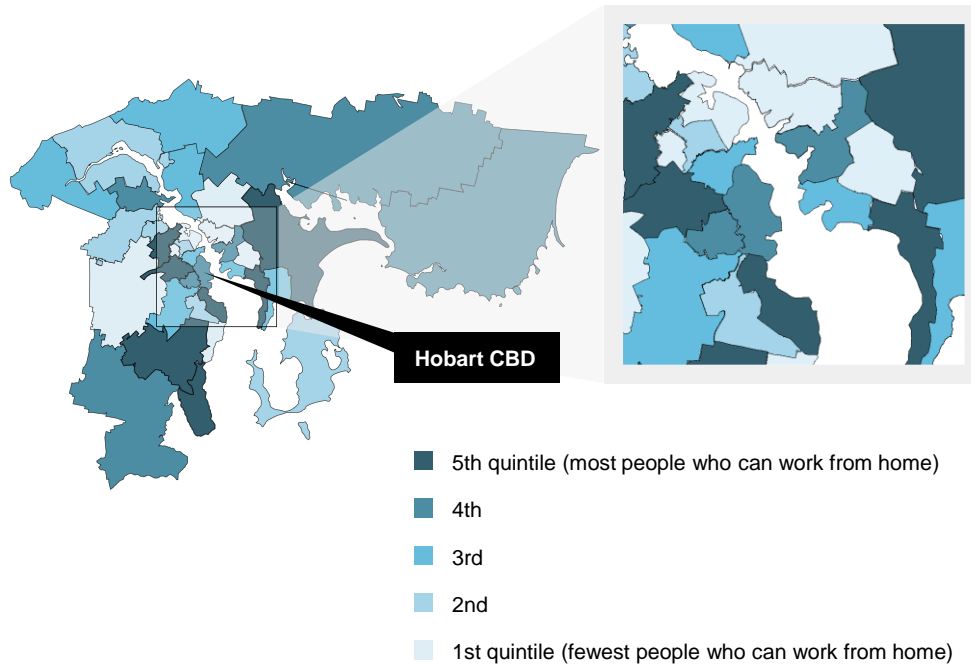
**Figure C.18 – Perth<sup>a</sup>****Potential to work from home, by place of usual residence, 2016**

**a.** Areas are categorised into quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

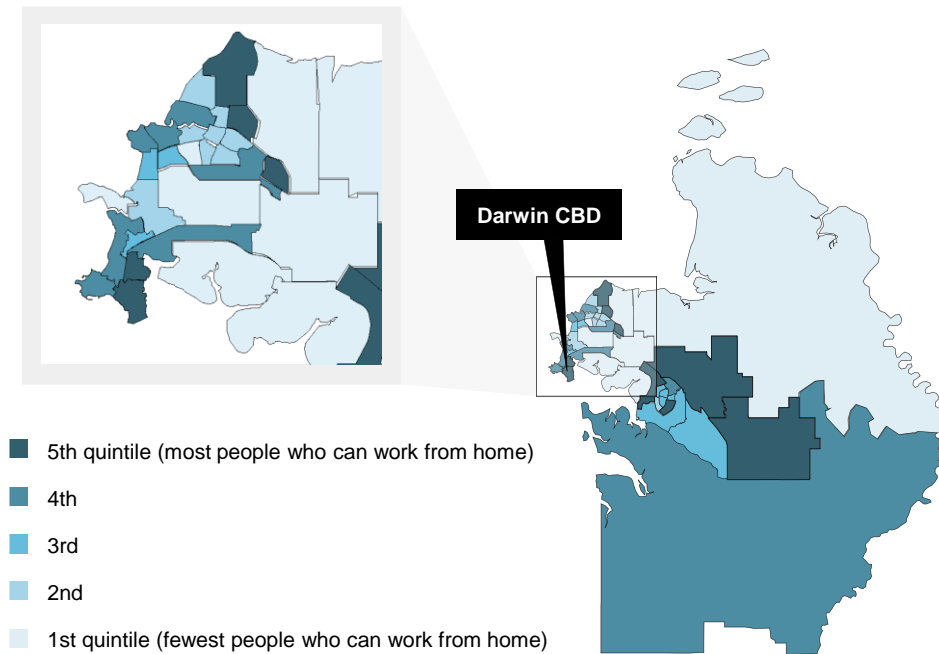
**Figure C.19 – Hobart<sup>a</sup>**

**Potential to work from home, by place of usual residence, 2016**



a. Areas are categorised into quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

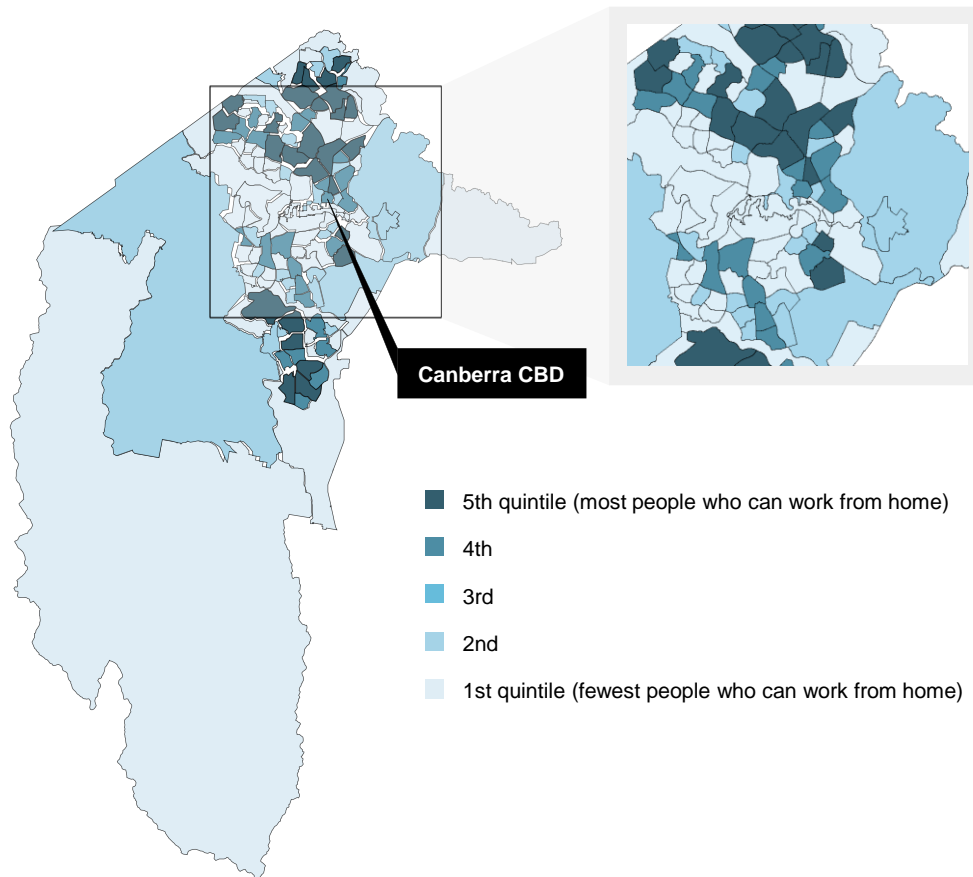
Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

**Figure C.20 – Darwin<sup>a</sup>****Potential to work from home, by place of usual residence, 2016**

a. Areas are categorised into quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

**Figure C.21 – Canberra<sup>a</sup>**  
**Potential to work from home, by place of usual residence, 2016**



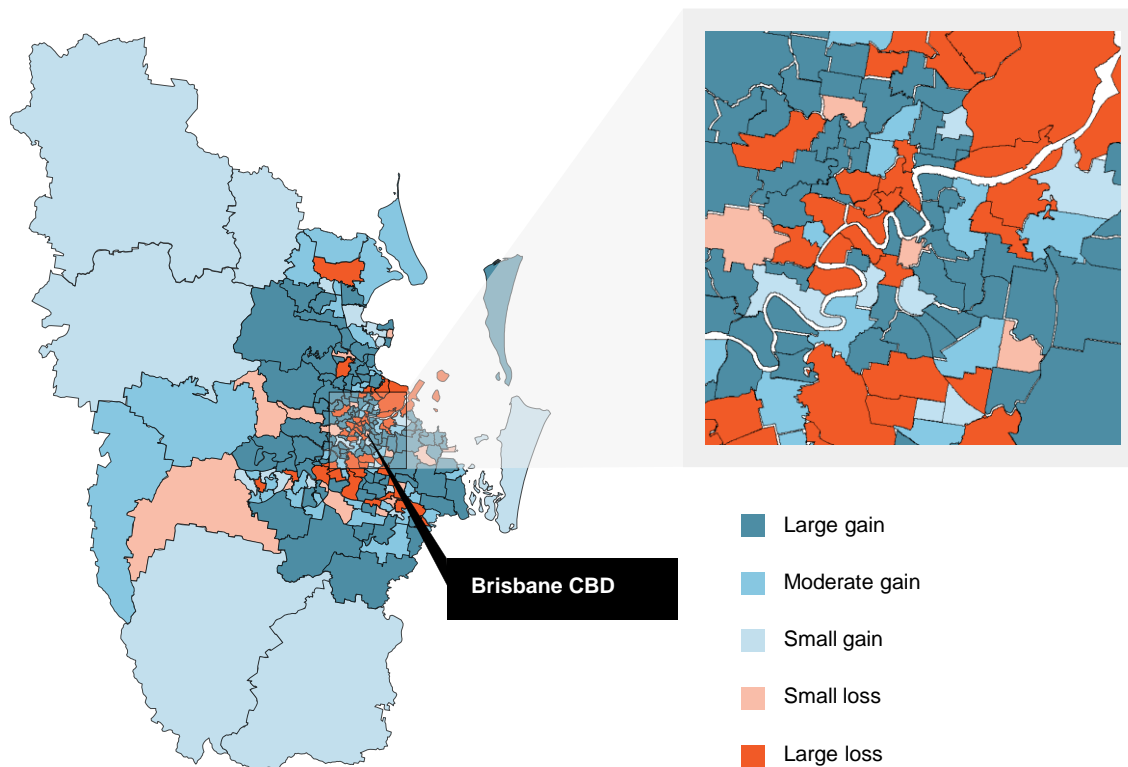
a. Areas are categorised into quintiles according to the number of people living in that area who can potentially work from home. Quintiles are calculated at the city level. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

## C.2 Distribution of potential change in the working populations of capital cities

**Figure C.22 – Brisbane<sup>a</sup>**

**Change in population if all people who can work from home do work from home, 2016**

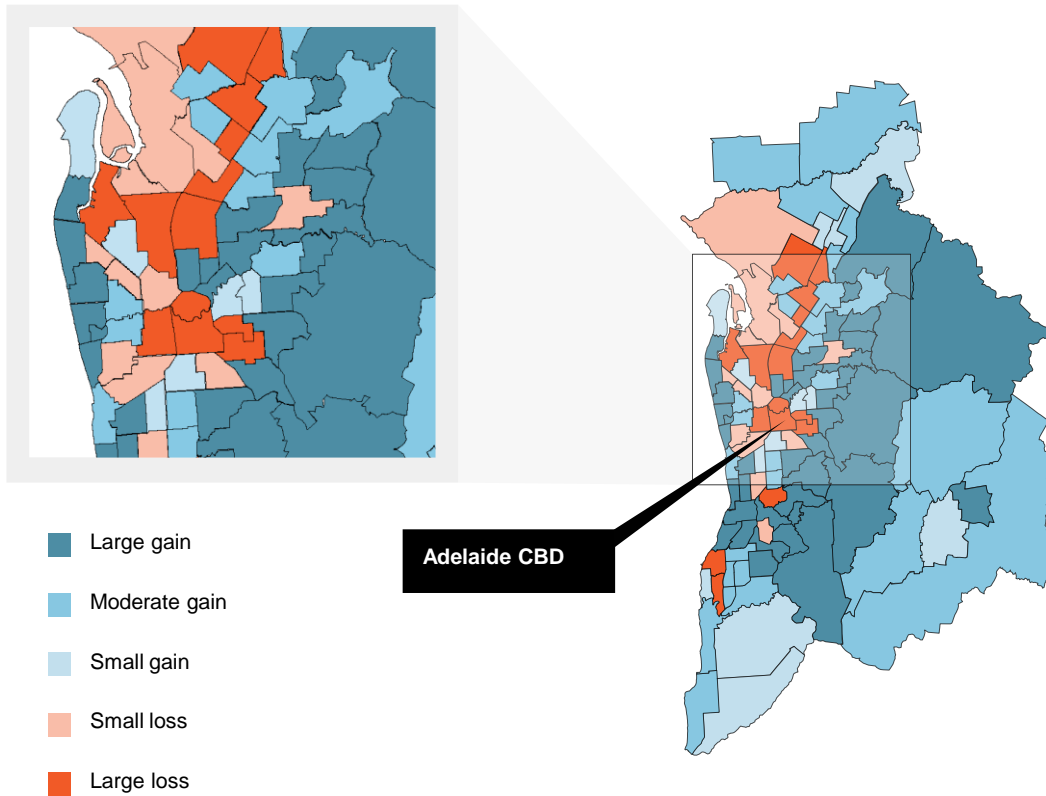


a. The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

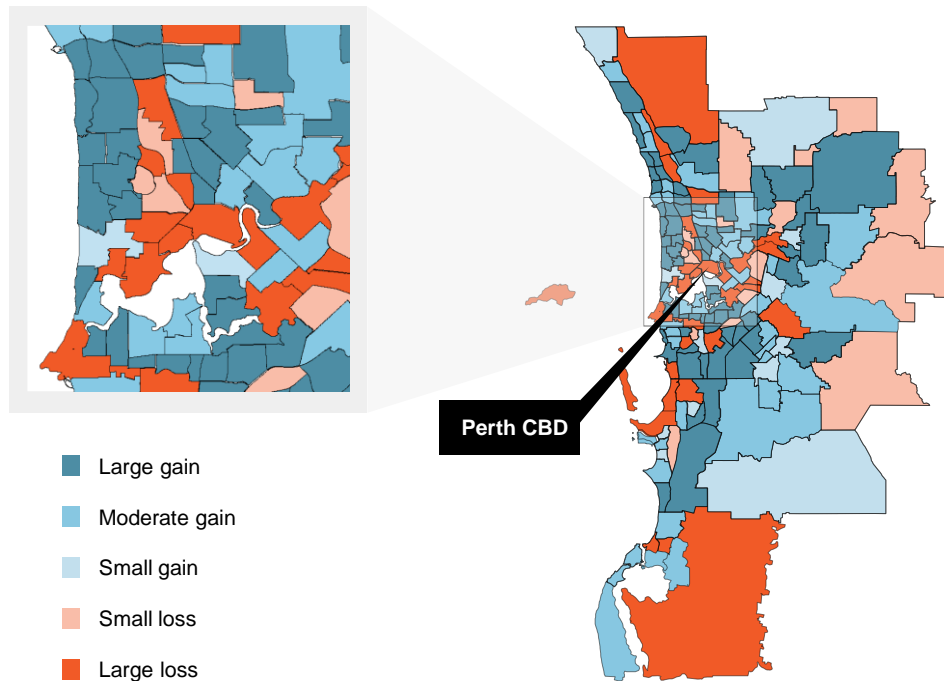
**Figure C.23 – Adelaide<sup>a</sup>**

**Change in population if all people who can work from home do work from home, 2016**



a. The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

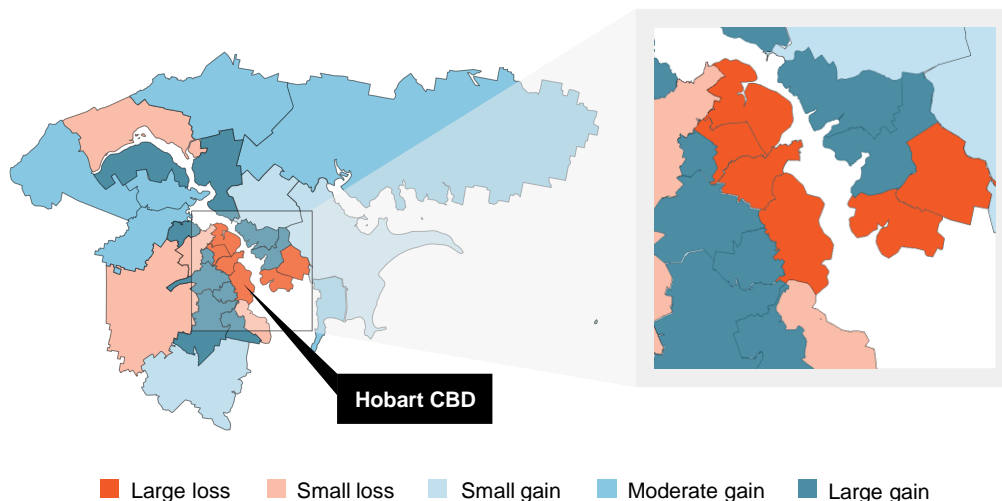
**Figure C.24 – Perth<sup>a</sup>****Change in population if all people who can work from home do work from home, 2016**

**a.** The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

**Figure C.25 – Hobart<sup>a</sup>**

**Change in population if all people who can work from home do work from home, 2016**

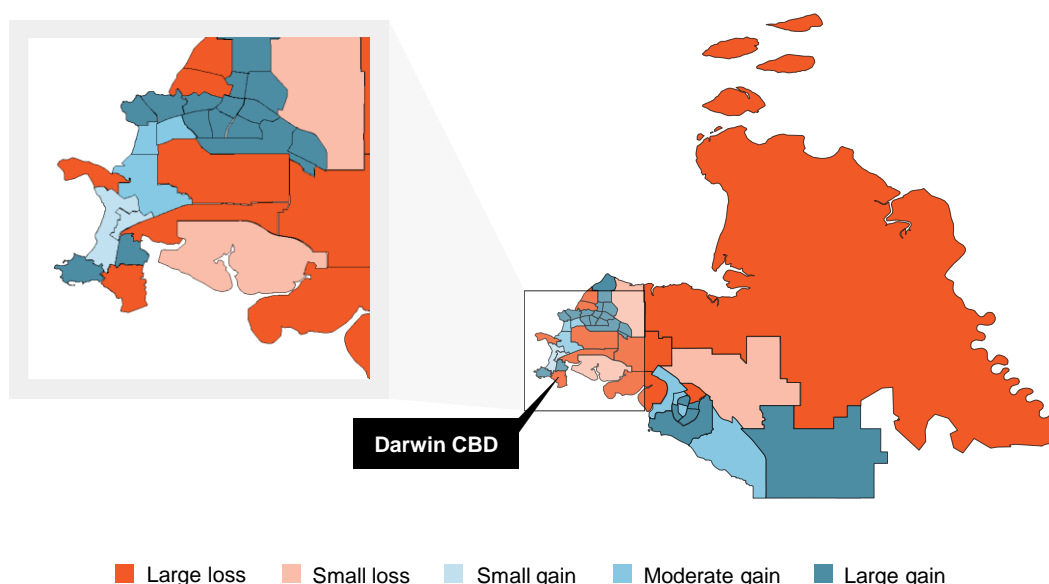


a. The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).

**Figure C.26 – Darwin<sup>a</sup>**

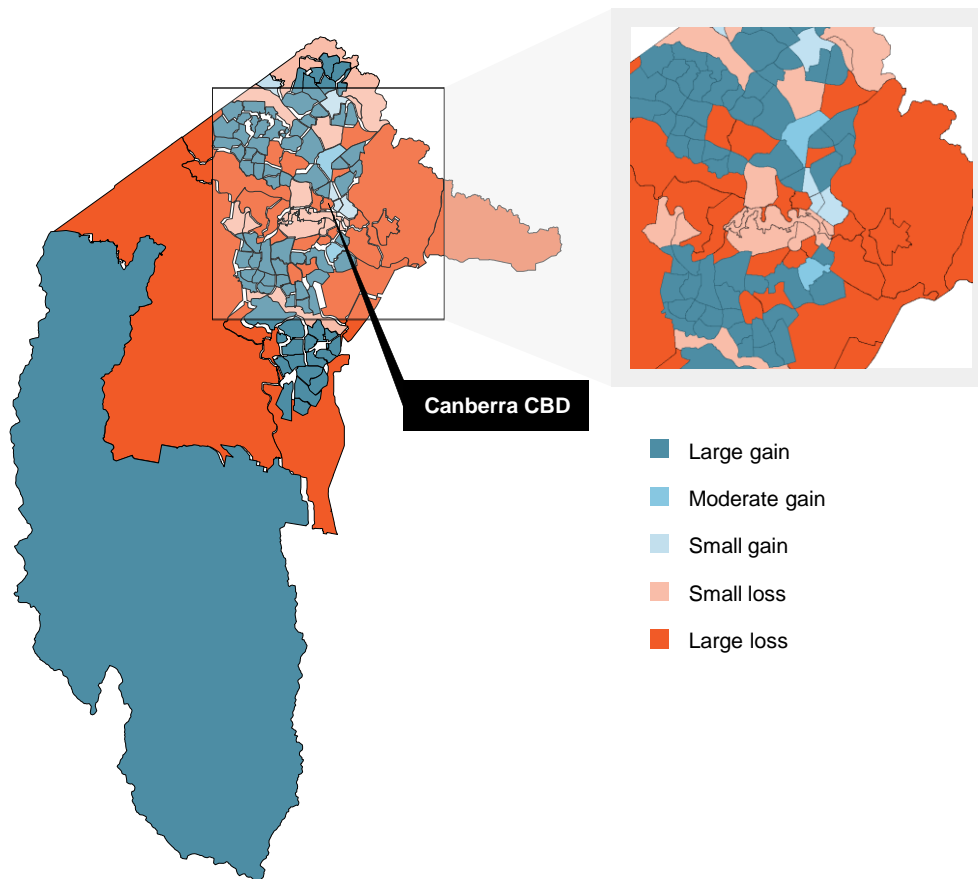
**Change in population if all people who can work from home do work from home, 2016**



a. The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).



**Figure C.27 – Canberra<sup>a</sup>****Change in population if all people who can work from home do work from home, 2016**

**a.** The figure shows the potential net change in the number of people working in an area if all the people who can work from home do work from home. Employment in an area may increase by the number of people who **live** in an area, can work from home, and typically work in a different area. It can decrease by the number who **work** in that area, can work from home, and currently live in a different area. Areas used for the analysis are at the Australian Statistical Geography Standard Statistical Area level 2 (SA2).

Source: Productivity Commission estimates using ABS (*Microdata: Census of Population and Housing, 2016*, Cat. no. 2037.0.30.001).



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