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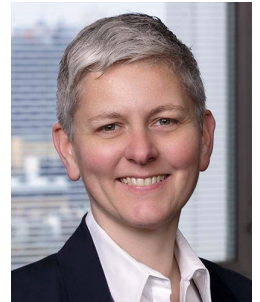
Innovation and Dynamism in the Post-pandemic World

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Thanks very much to the Committee for the Economic Development of Australia for the invitation to give this talk. I would very much have liked to be able to travel to Perth to do so in person, as was originally planned, but it was not to be. Our nation is opening up, but mindful of the ongoing health risks, this is taking place in stages. The remaining restrictions on travel remind us that the pandemic is not over. The world is still facing a major public health challenge. The transition from pandemic to endemic is not straightforward. Even so, we are far enough along that transition that it is worth asking what the post-pandemic future might look like, even if the answer is not yet clearly in view.

After any major global event such as this, it's natural to want things to go back to 'normal' – to restore everything to the way it was before. At the same time, there's a countervailing tendency to believe that nothing will ever be the same again. As is often the case, the truth is likely to be somewhere in the middle.

As I touched on in another talk earlier in the year, in the face of a big shock, people and organisations adapt (Ellis 2021). In some cases, adapting to events sets your future on a different path. This is the topic of my talk today – adaptation, innovation and dynamism, and how the experience of the pandemic might have changed things. This is a central question for the shape of the post-pandemic future. Dynamism – the drive to innovate, adapt and evolve – helps underpin a society's living standards.

Before the pandemic

This question is especially salient at the current juncture. In the decade or so leading up to the pandemic, there was a nagging sense that these engines of prosperity were running out of steam. Investment was low; productivity growth was lagging; and many of the behaviours we associate with

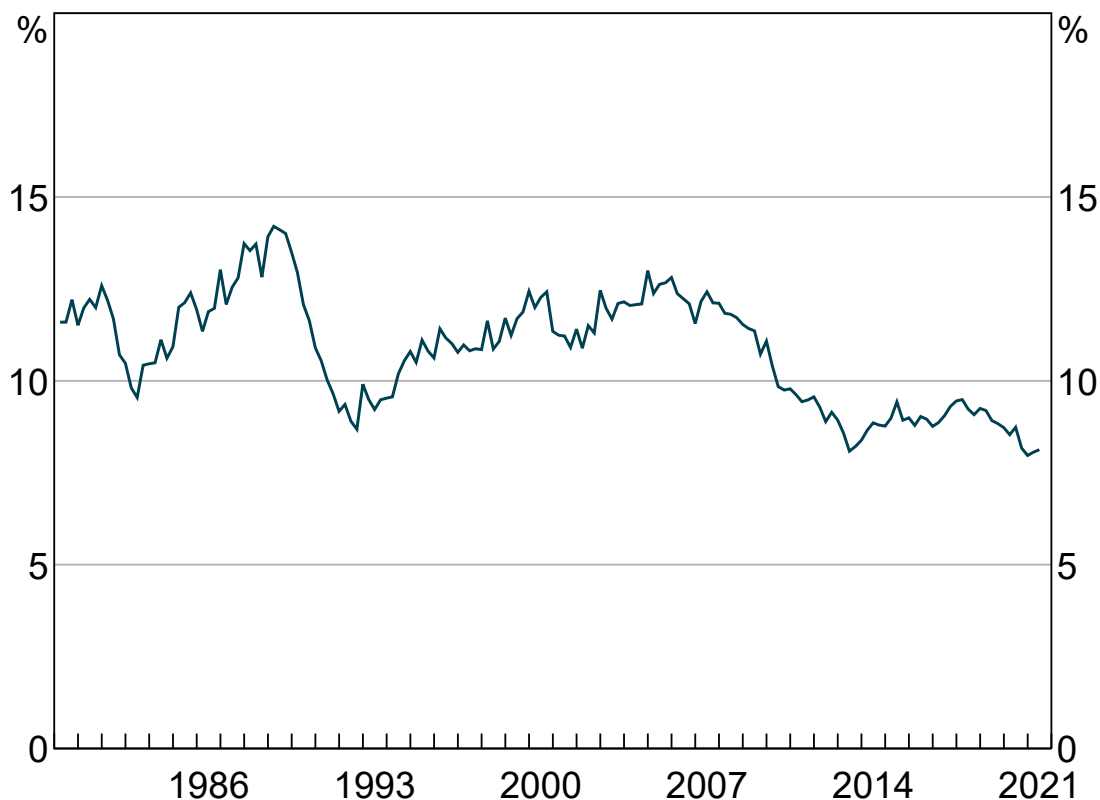
business dynamism were on the decline. These trends were evident across many advanced economies and spurred a debate about so-called 'secular stagnation' (Summers 2014).

Australia was not immune to these trends. We did see a once-in-a-century boom in mining investment. Outside of mining, though, business investment declined as a share of the economy, especially after the global financial crisis (GFC) (Graph 1). Even after the mining investment boom ended, non-mining business investment showed little sign of coming back. Instead, firms increasingly held onto cash – a trend that was also apparent globally, but especially the case in Australia (La Cava and Windsor 2016). Productivity growth is measured with a fair amount of noise, making the underlying trends hard to see. But there, too, the trends in the post-GFC period were disappointing (Graph 2).

Graph 1

Private Non-mining Business Investment*

Share of nominal GDP



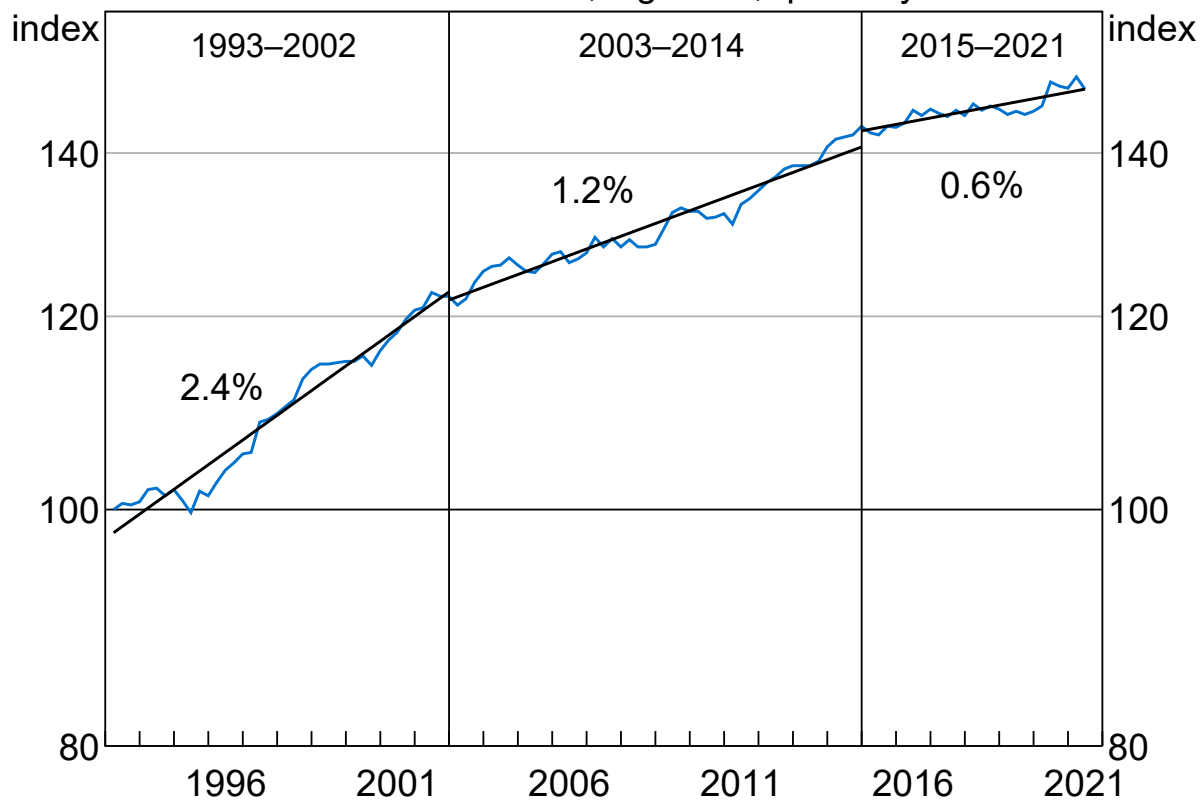
* Net of second-hand asset transfers; RBA estimates

Sources: ABS; RBA

Graph 2

Labour Productivity*

March 1993 = 100, log scale, quarterly

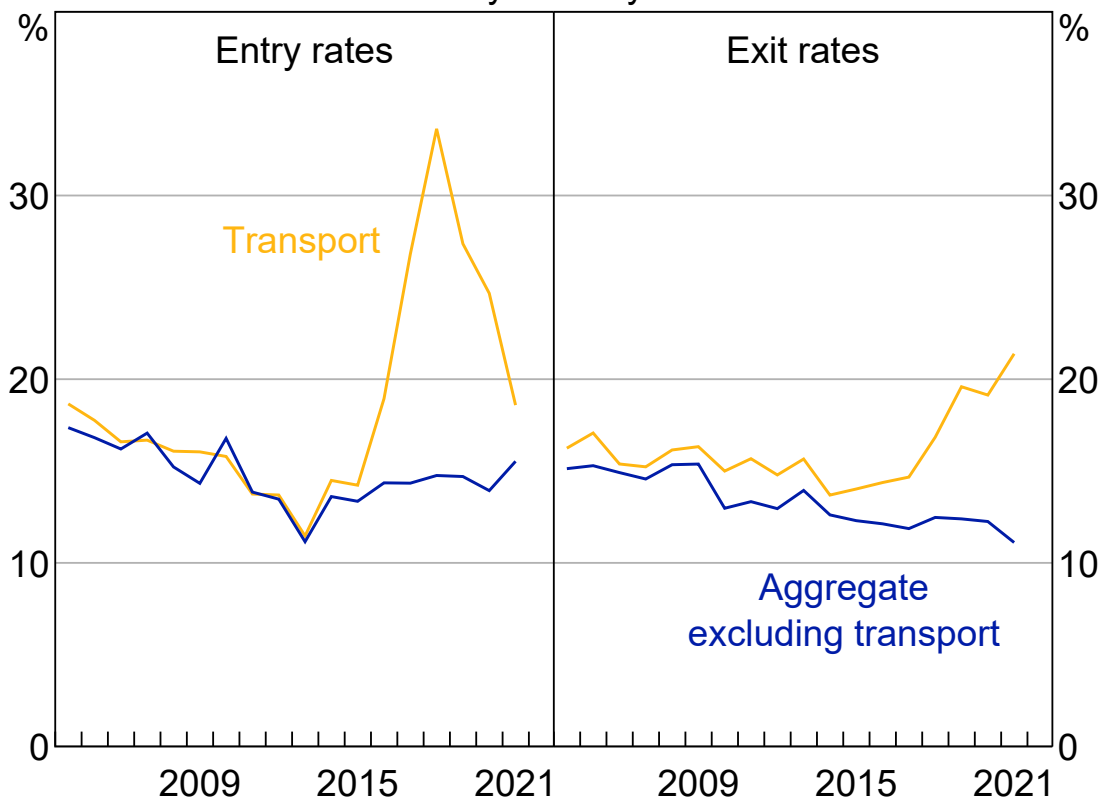


* GDP per hour worked; black lines denote linear trend; labels show average annual growth

Sources: ABS; RBA

Perhaps related to this, measures of dynamism in the economy were also mostly below their historical trends. Entry rates for employing businesses were trending down, and so were exit rates. Abstracting from the effect of Uber and other self-employed drivers in the ride-share and other transport industries, business formation and exits were both lower post-crisis than they had been earlier this century (Graph 3).

Graph 3
Business Entry and Exit Rates
 By industry



Source: ABS

Business entry is an important part of dynamism because new firms are often innovators. Start-ups are seen as the firms with new ideas, new products and new investment. Often new firms are small firms, and we know smaller firms account for an outsized share of business investment. In Australia, the top 1 per cent of firms account for nearly 70 per cent of production, but only half of all investment.

That is not to say that existing firms don't innovate. Survey evidence shows that a significant and increasing fraction of firms engage in innovative activity and change their business models in any given year. Certainly more firms are taking orders online, especially since the pandemic and associated lockdowns started. But for all the talk of 'disruption', the overall sense one gets from the data is of a bit less dynamism or inclination to shake things up.

The labour market shows a similar pattern. Job-switching has trended down over several decades (Graph 4). This need not be a bad thing: some job changes aren't voluntary, as the spike during the early 1990s recession shows. But Australian Bureau of Statistics (ABS) surveys also show a trend decline in the share of workers who say they plan to leave their job to get a better job. This decreasing tendency to leave a job occurred at the same time that workers became increasingly fearful that they would lose a job. Our own research has shown that, on average, workers systematically overestimate the chances they will lose their job over the coming year (Penrose and La Cava 2021). That overestimation increases when economic conditions are weak, and took a step up following the GFC. One can't help but suspect that when people feel less secure, they are more

inclined to hold onto what they have, rather than take the risk of making the leap to something new and possibly better. [\[1\]](#)

Graph 4

Job Mobility*



* Data are interpolated between surveys, which are conducted annually in February

Source: ABS

Possible causes

These observations – less investment, less job and firm turnover and less productivity growth – all suggest less adaptation, and so a bit less dynamism. In combination, these shifts lend weight to the concerns about secular stagnation. They also might connect to some of the other patterns in the economy in the lead-up to the pandemic – low inflation, slow growth in wages and a sense that very low interest rates were needed to stimulate demand, in order to attain decent rates of economic growth. What could be causing this apparent lack of dynamism? And should we therefore be concerned about future growth potential and living standards?

As always with complex phenomena emerging from the decisions and actions of many, the cause never boils down to just one thing, or even a couple of things. We can help our understanding, though, by ruling a few things out and by establishing that some things could only ever be a partial explanation.

First, we should consider timing. Some of the trends I've mentioned have been relatively smooth over a number of decades, but quite a few saw a step change in the aftermath of the GFC. This

suggests that we can't explain these outcomes entirely with longer-run trends such as demographic change. There's some evidence that it might be one contributing factor, but it's unlikely to be the whole story.

Second, Australia is not alone in seeing these trends. So we should not seek the causes entirely in Australian-specific developments, such as regulatory change. There might be something Australian-specific going on: for example, wages growth was particularly weak relative to history in Australia, compared with some other advanced economies. It's possible that some Australian-specific factor raised feelings of job insecurity, reduced job turnover, and thus dampened factors that might otherwise support growth in wages. The psychology literature tells us that Australians are a bit more risk-averse on average than residents of some other English-speaking countries. [\[2\]](#) But again, country-specific factors are unlikely to be the whole story.

Explanations of the decline in these indicators of dynamism, such as investment or firm turnover, also need to be consistent with those other developments – low inflation and wages growth. It's difficult to explain reduced dynamism with a hypothesis that regulation increased labour costs, for example. If labour were too expensive, why wouldn't firms invest in labour-saving innovation? And if costs were rising for all firms, why weren't prices rising faster? You could instead speculate about a misplaced perception that costs are too high, leading to downward pressure on growth in labour costs. If, as a result, labour becomes cheap relative to productivity, firms would have less need to invest, because the payoff to labour-saving technology is lower. Even that hypothesis is a bit unsatisfying, though, because it doesn't explain the lack of disruption. Why aren't more new firms coming in, willing to attract workers by paying higher wages, and investing their way to higher productivity of that labour?

So after all the digressions of what probably *doesn't* explain the situation we found ourselves in on the eve of the pandemic, I'd like to step through some possible explanations that look more fruitful. They boil down to technology, incumbency and risk.

The exclusivity of the new technology

It sometimes seems hard to square observations of reduced dynamism and productivity growth with all the talk about disruption and the wave of amazing new technologies such as machine learning and related innovations. (And they are pretty amazing!) A parallel with the 1990s could be drawn. At that time, the economics profession was puzzling over the fact that 'you could see the computer age everywhere but in the productivity statistics' (Solow 1987). It turns out that we just had to give them a bit more time. By the late 1990s, productivity was booming across many economies, including Australia (Oliner and Sichel 2000). Personal computers and the internet did indeed hold a lot of promise. It simply took firms a while to work out how best to leverage them, and to reorganise their processes and business models to reap the benefits (Brynjolfsson and Hitt 2000).

In the face of unfamiliar technology, investment and productivity growth could well lag. And perhaps business formation does, too, if people have to learn more about a technology before they start a business that uses it. The timing and cross-country nature of such a trend also fits the facts. So there is some merit to this explanation.

If we were simply facing a repeat of the 1990s, that would not be a bad thing. We would just need to wait a while until everyone works out how to adapt to these new technologies. But I'm not convinced that the situation is quite so self-correcting this time. As I've noted before, the AI/machine learning revolution is the first time that an apparent general-purpose technology is actually harder to use, and requires a higher – and rarer – set of skills to operate, than the technologies it seeks to replace (Ellis 2018). This is not just an issue of having enough people with PhD-level skills in designing the algorithms; even scarcer is the wisdom and judgement to know when your algorithm has embedded an undesirable bias, or has gone awry altogether.

The temptations of incumbency

To the firms that do work out how to leverage new technologies go the spoils. This is the message of an important strand of research on so-called 'superstar' firms (Autor *et al* 2020). By leveraging new technology and optimising their structures, including across borders, these firms attract the most-skilled workers and even more of the profits. The laggard firms, according to this hypothesis, survive by remaining low cost. So they get locked into a low-wage, low-investment groove. And because it's hard to know if you'll be the superstar – and convince investors that you will be – business entry rates also fall.

But this doesn't seem to be a benign story of the most productive firms winning out. Many industries are becoming more concentrated (Hambur and La Cava 2018). At first glance, this might seem to be the result of productive firms out-competing rivals. But a story of increasing competition is hard to square with other evidence of rising margins (Hambur 2021). And if the most productive firms were increasingly dominating markets, productivity growth overall should be strong. In fact productivity growth has, as I've mentioned, been slowing down, and not just in Australia. The same patterns of declining business and job dynamism but rising concentration and profits are evident in the United States (Akcigit and Ates 2021) and elsewhere (Calvino, Criscuolo and Verlhac 2020).

It might not be that the superstar firms were inherently the most productive. It could instead be that barriers to entry have increased. This would line up with reduced rates of business entry, obviously. It would also help explain the decline in business exits, because firms will only clear those barriers and enter if they have a good chance of survival and success. Facing less of a challenge from entrants, the incumbent firms would see less need to invest, to raise productivity, or to compete for workers by paying attractive salaries.

One possible explanation of barriers to entry, declining dynamism and rising concentration might be that the rate of knowledge diffusion has slowed (Akcigit and Ates 2021). This could perhaps be because firm-specific know-how or organisational culture have become more important (Andrews, Criscuolo and Gal 2015). But I can't help wondering if the complexity of new technologies such as machine learning itself helps create the barrier to entry. The few firms that manage to harness these innovations gain an advantage that other firms can't overcome. The result is a winner-takes-most world of increasing concentration. The question is how much incentive those winners have to keep innovating to forestall future rivals.

The disincentive of risk

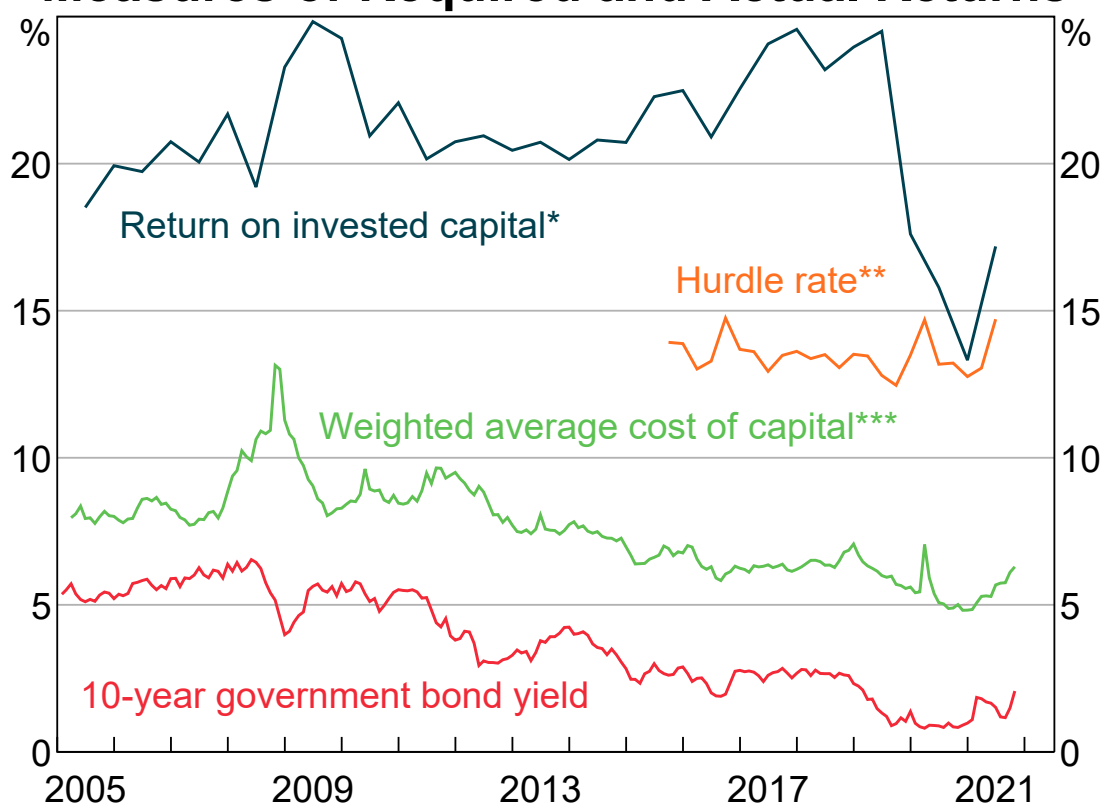
There's another possible explanation for these barriers to entry – and both it and the technology-based explanation could be true. It might be that barriers to entry have arisen, and dynamism declined, because of people's own preferences and decisions.

Remember that some of these trends shifted in the aftermath of the GFC. Experience of a crisis can shift perceptions of risk, and so reduce people's appetite to take risk. As my colleague Brad Jones pointed out a few months ago, the experience of the financial crisis increased the perception of risk and the desire for safety (Jones 2021). Some of that desire for safety was a necessary counterbalancing after a period of excessive risk-taking in the global financial sector. But it's entirely plausible that the change in financial behaviour influenced risk perceptions and decisions in the corporate sector more generally.

And if perceptions of risk increase, people will want payoffs on investment projects to be further above the cost of finance. And that is exactly what has happened. Hurdle rates on investment projects have remained high even as interest rates and the cost of capital have fallen (Graph 5). ^[3]

Graph 5

Measures of Required and Actual Returns



* Annual after-tax operating income divided by the sum of fixed assets and net working capital minus cash holdings; excludes financials and resources companies

** Average rate across industries

*** Market-value weighted average of the cost of equity and the after-tax cost of debt for a BBB-rated non-financial corporation

Sources: ABS; Bloomberg; Morningstar; NAB; RBA

This stickiness in hurdle rates is apparent both in Australia and overseas. And again, there are plenty of possible explanations, and more than one of them could be true (Lane and Rosewall 2015). Firms might keep their hurdle rates high because they are uncertain what the right hurdle rate should be, or because individual managers don't want to be associated with a failed project. Or perhaps it's because firms only have so much management capacity. So they don't want to commit to a marginal project in case a better one should come along.

Another strand of research suggests, again, a role for rising market power and concentration – this time in combination with increased perception of risk (Farhi and Gourio 2019). According to this story, hurdle rates have stayed high – and investment low – partly because existing firms require these returns because they perceive higher risk. And because everyone perceives risk to be higher, potential rivals don't enter. So the market power of the incumbent firms is preserved.

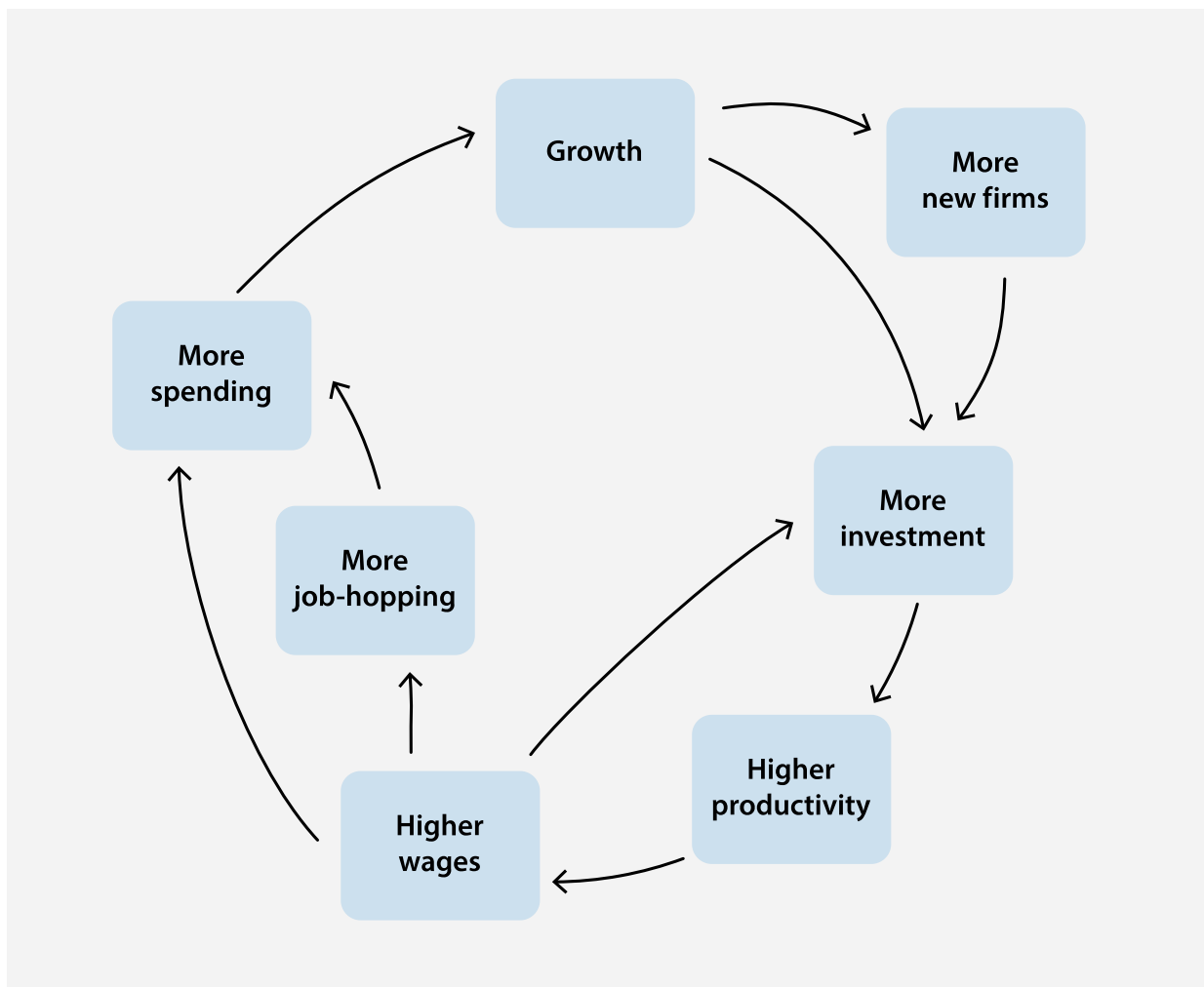
A macro view of a hothouse flowering

In this dizzying array of interrelated causes, it could be that some are more relevant for multi-decade trends and others for the shifts since the GFC. Before turning to the effects of the pandemic, I want to canvass the possibility that the ebb and flow of economic expansion and contraction itself plays a role in business dynamism and related trends. Risk perception might well have increased, but that needs to be balanced against perceived opportunity. New firms will be more likely to enter, and existing firms more likely to invest, when they see business opportunities. Workers are more likely to switch jobs if they see plenty of job opportunities – and higher pay. And when labour is scarce, and no longer cheap, it makes sense to invest in labour-saving technology.

By contrast when conditions are weak, everyone focuses on defending what they have instead of pursuing new opportunities. A 'scarcity mentality' prevails, with cost control and austerity the principal mindset.

From this perspective, strong growth and a tight economy could produce a virtuous cycle of more business dynamism, more investment, higher productivity and higher wages. Rather than the supposed 'creative destruction' of a downturn, what is needed is the creative ignition spurred by a strong economy. The weakened financial sector and heightened perceptions of risk following the GFC no doubt made it harder to achieve that virtuous cycle (Figure 1). But perhaps it still would have been attainable if so many economies had not turned so swiftly to fiscal consolidation.

Figure 1: The Virtuous Cycle of the Hothouse Flowering



How the pandemic might have changed things

If the GFC taught everyone to be more mindful of financial risk, perhaps the pandemic has reminded us about health risks. Ongoing health measures could add to costs, bulk up supply chains and slow down production processes. Certainly the prospect of outbreaks disrupting supply chains adds to risk, not just perceptions of it. So it would be understandable to conclude that the post-pandemic world will remain a risk-averse one, with slow growth and subdued dynamism.

I'm not so sure that this will be the outcome, though. Or at least it doesn't have to be. The context is very different. After the GFC, demand was weak and the financial sector itself was constrained. As such, less finance was available even for good, but risky, projects. This time, demand is bouncing back strongly, supported by policy. Shifts in demand between goods and services have opened up some industry-specific business opportunities, including for new firms. Meanwhile financial sectors globally are in good shape. Business sectors are also in much better financial shape than they were after the GFC. Profits have recovered quickly, and fiscal support has meant that some firms are considerably more cashed up than before (Graph 6). So the opportunities are there, if not in every industry, and businesses are well placed to fund or finance that investment.

Graph 6

Cash Holdings of Corporations*

Aggregate ratio to monthly expenses



* Private non-financial corporations

Sources: ABS; RBA

Whether the global economy finds itself on a path to a Roaring Twenties or a post-pandemic malaise depends on the choices that many of us make. These will in turn depend in part on the stories we tell ourselves about the experience and the lessons we learned. And one of the stories we could tell and lessons we should learn is that, actually, people and firms can adapt and have done so.

This isn't just about increased use of remote working and teleconferencing, though clearly that is an important part. One can also see increased online sales, new products and services, new suppliers – and an increased focus on what's important, sloughing off the inessential. Even the supply disruptions that are on everyone's mind can turn out to be the constraint that spurs some creativity. One can also see some incredible advances in medical technology, achievements in logistics in many countries' vaccine rollouts, and a newfound data literacy as we all tracked case numbers and vaccine coverage in our news media. Nobody can predict quite what will come from all of that.

Concluding comments

None of these advances can compensate for the loss of life from the pandemic itself. All the more reason not to compound the tragedy by choosing the path of risk-aversion and slow recovery. In taking opportunities, we will always need to be mindful that not everything is in our control. Things never turn out exactly as expected, and it is pointless to wish otherwise. Certainly there are aspects

of life where a craving for zero risk and absolute safety is understandable. In the dynamic realm of business, innovation and investment, though, it is more a case of nothing ventured, nothing gained.

Thank you for your time.

Endnotes

- [*] My thanks to a number of current and former colleagues who have contributed to some of the material presented in this talk and helped sharpen my thinking on these issues, including Joel Bowman, Lachlan Dynan, Henry Edwards, Jonathan Hambur, Gianni La Cava, David Lancaster, Kevin Lane and Stephanie Parsons. Thanks also to the Member for Dunkley, Ms Peta Murphy, for her interest in this topic and encouraging me to speak about it.
- [1] And yes, I recognise that this comment is a bit rich coming from someone who has worked at the central bank for 30 years!
- [2] Thanks to Professor Elizabeth Sheedy for drawing my attention to this literature a few years ago.
- [3] Thanks to Henry Edwards and Kevin Lane for this graph, which comes from forthcoming work to be published in the next issue of the RBA *Bulletin*.

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