The rate that stops a nation?

Preparing for lower or even negative rates in Australia

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On Melbourne Cup Day, and again in December, many bankers breathed a sigh of relief when the Reserve Bank of Australia (RBA) announced a pause in the rate cutting which has taken the cash rate to 0.75% and which many expect to go further to 0.25% next year. Although the RBA downplays the possibility, its actions over the past six months force Australians to confront the very real scenario of interest rates going to zero or below – something that has already occurred overseas.

How can this be? And how does capitalism work in a world of negative interest rates (NIR) where borrowers get paid to take out a loan?

The short answer is: negative rates are possible – and yes, capitalism still works – but not in the same way.

Australian banks, investors, businesses and other stakeholders need to understand how negative rates are possible, what they mean for them, and how to prepare for a future economy which will look very different from the one they've known for a long time.

In this report we discuss each of these points, as well as lessons from experiences around the world, and implications for banks.

The good news for banks is that, aside from a number of technical challenges which we discuss, the strategic imperatives for banks in a low-rate environment are not that different from the ones they face today:

- Consolidate and simplify to improve productivity,
- Build up services that customers value, and
- Make judicious choices about which customers and risks to focus on.

The bad news, as we shall argue below, is that low rates compress the time that's available to make the transition, and lower the margin for error along the way. If sustained, low rates could result in a profound realignment of the competitive landscape. Some players (including, we suspect, a number of new entrants) may find they have the agility to thrive in a leaner environment, whilst others do not.

Overview

Record-low rates which may go lower still

Whilst the RBA's Cup Day decision was accompanied by a mini surge of optimism, long-term bond yields suggest minimal expectation that rates will return to 'normal' anytime soon. In fact, expectations are that rate-cutting will continue. Negative interest rates (NIR), whilst not yet here, are a very real potential on the horizon.

Alongside its Cup Day announcement that it would hold rates steady, the RBA released a statement making it clear it was 'prepared to ease monetary policy further if needed'. In December it reiterated this position.[1] With the global economy in its tenth year of expansion, not to mention a daunting assortment of geopolitical risks, the likelihood that conditions may deteriorate are skewed to the downside. What's more, the minutes of the RBA's Board imply that November's decision not to cut was a close call.[2] This suggests that rate cutting could resume.

Most observers are calling for a cash rate as low as 25 basis points (bps) next year and, with the Australian Commonwealth Government 10-year bond yielding just 1%, there appears to be little concern about rates reverting to long-term average any time soon **(Exhibit 1)**.

For these reasons, we believe it is prudent for bankers, business leaders and other stakeholders to think about what NIR would mean for them and their stakeholders, and to plan for the very real possibility of a negative cash rate in Australia, if not soon then over the medium term.

This report addresses these things and more, and is organised around the following four key points about NIR:

1. **Capitalism won't break, and rates can go negative, even in Australia:** There is nothing impossible about NIR. Zero is just another number (in principle)[3], so there exists no intrinsic reason why low or even negative rates must revert any time soon. What's more, notwithstanding assurances to the contrary, there is no reason to believe this cannot or will not happen in Australia.
2. **Negative rates present serious challenges to the financial system,** and to the economy overall which bankers and directors need to understand and for which they should prepare.
3. **Three kinds of readiness will be required from bankers and their boards** – technical readiness, financial readiness and strategic readiness – for which they should be preparing now; and
4. **To get started, there are many 'no-regrets' actions to take** which will serve them well regardless of future rate outlook, although NIR raises the stakes and urgency.

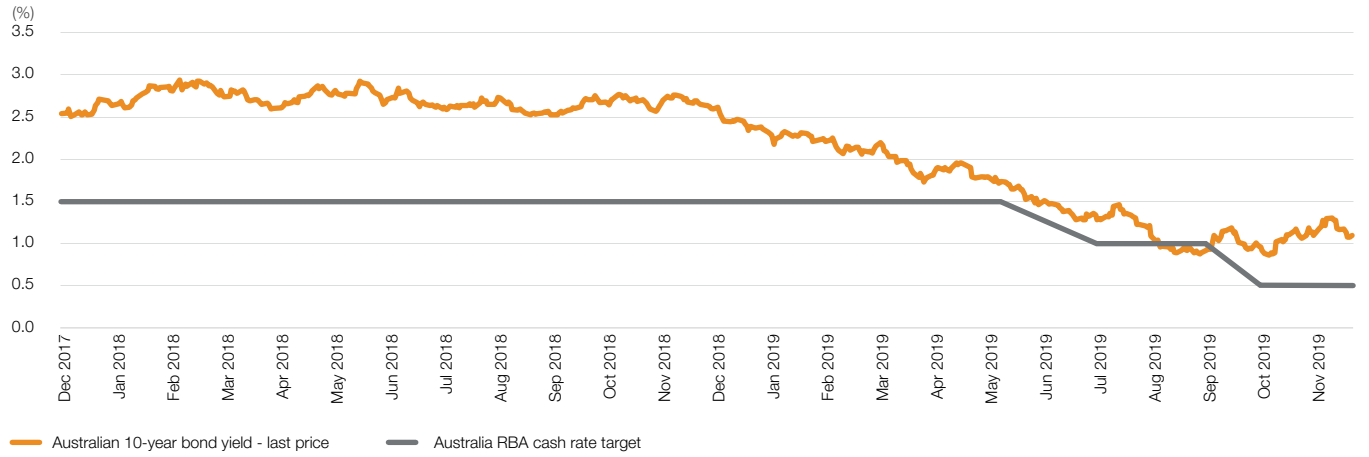
The remainder of this paper provides an in-depth and technical exposition of each of these points, which are summarised in **Exhibit 2.**

(1) Statement of Monetary Policy, Reserve Bank of Australia, November 2019 and December 2019.

(2) Minutes of the Monetary Policy Meeting of the Reserve Bank Board, Reserve Bank of Australia, 5 November 2019.

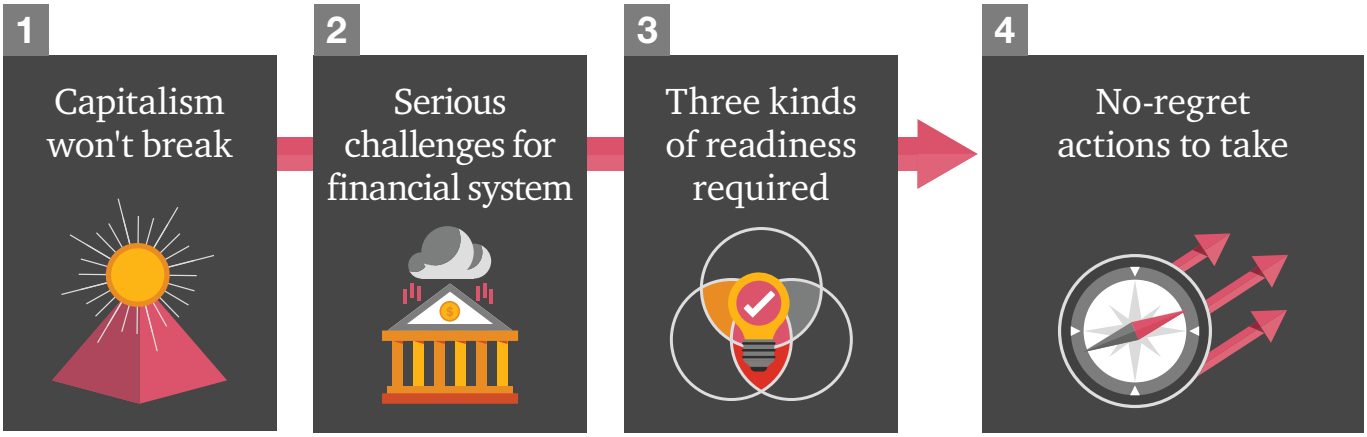
(3) In practice, zero is a number which has psychological significance for many participants and an established association for many products, such as fee-free transaction accounts. There is also the 'floor' associated with the embedded option that any lender has because they can always choose to not do so. Of course, it costs money to store money, so this 'floor' is actually less than zero. We will discuss this again in Section 2.

Exhibit 1: Low rates to stay? 10-year bond yield suggests markets expect they will



Source: Bloomberg

Exhibit 2: Four key points about negative interest rates (NIR) in Australia



Rates can go negative, even in Australia

- Other markets often feature negative rates (e.g. gold and physical currency)
- Abroad, negative rates have been with us for some time
- In Australia, RBA has ample scope and firepower to bring about negative interest rates (NIR)

Likelihood of future subdued growth and elevated vulnerability

- Inflection point for global growth – or massive monetary distortion?
- Unintended consequences of monetary stimulus grow with time horizon
- Lower-for-longer may leave financial system more vulnerable to future shocks

Scrutiny, care and readiness required at three levels

- **Technical readiness:** Y2K-like systemic issues
- **Financial readiness:** impact on balance sheet, P&L, customers and other stakeholders
- **Strategic readiness:** decisions about operating model, customer offer, segmentation, pricing and risk

Regardless of outlook for rates, NIR raises stakes and urgency

- **Ensuring readiness:** technical, financial and strategic
- **Getting fit to compete:** business consolidation, simplification and streamlining of operating costs
- **Positioning to thrive:** identifying services to generate sustainable fees and other-operating income, customer segments aligned to uniqueness of franchise and opportunities to help customers and other stakeholders through challenging low-rate environment

Contents

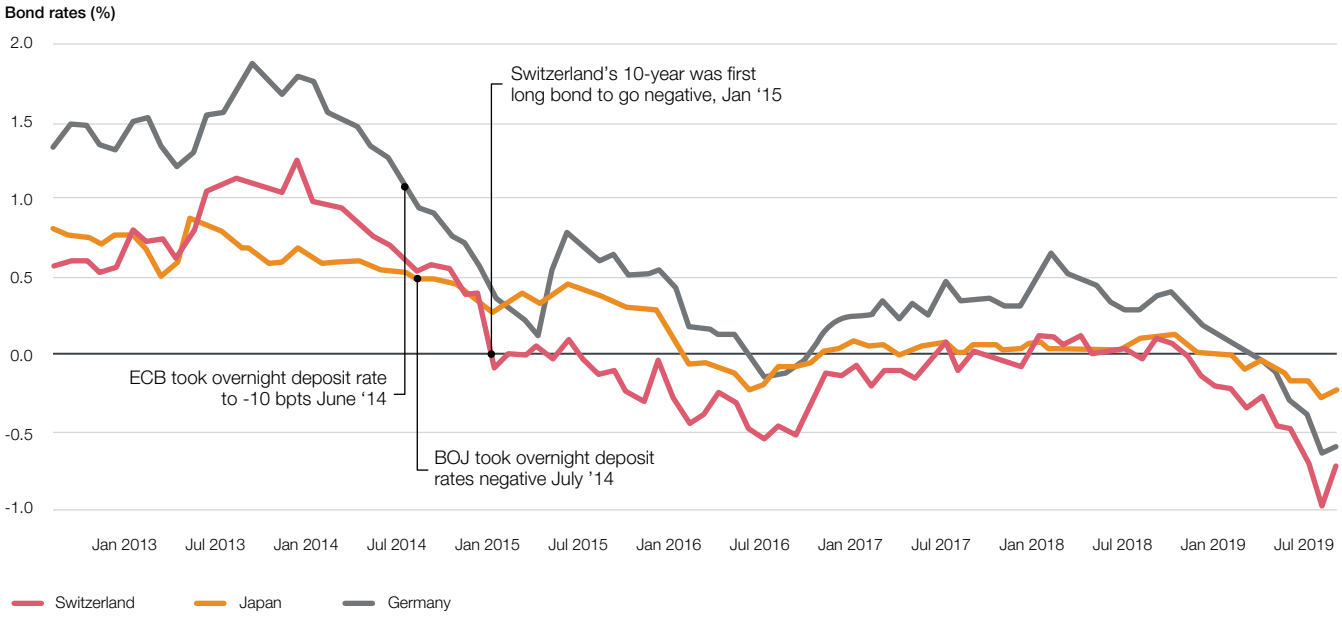
01

Capitalism won't break, and rates can go negative in Australia

There is nothing impossible about negative rates. They have been with us for some time, and they reflect a world in which the cost to store money outweighs the expectation of opportunity cost, credit risk and inflation. Whether that expectation proves to be right is another matter entirely. Likewise, and despite assurances to the contrary, there is no reason to expect Australia to elude the global trend towards negative rates should it continue.

Exhibit 3: Negative rates have been with us for some time

Ten-year government bond rates, Germany, Switzerland and Japan



Source: FRED: Federal Reserve Bank of St. Louis Economic Data.

"Give me some of that. Give me some of that money. I want some of that money."

President Donald Trump on negative rates[4]

Negative rates have been with us for some time

The first thing to observe is that negative rates have been with us for some time. Japan was the first major nation to embark on a policy of what once would have been considered extreme monetary easing. Following the crash of the Nikkei in 1990 that metastasised through the economy, the Bank of Japan (BoJ), severely criticised for not acting aggressively enough, began a rate-cutting program that took its base rate to 50 bps in 1995 and to zero in 1999.

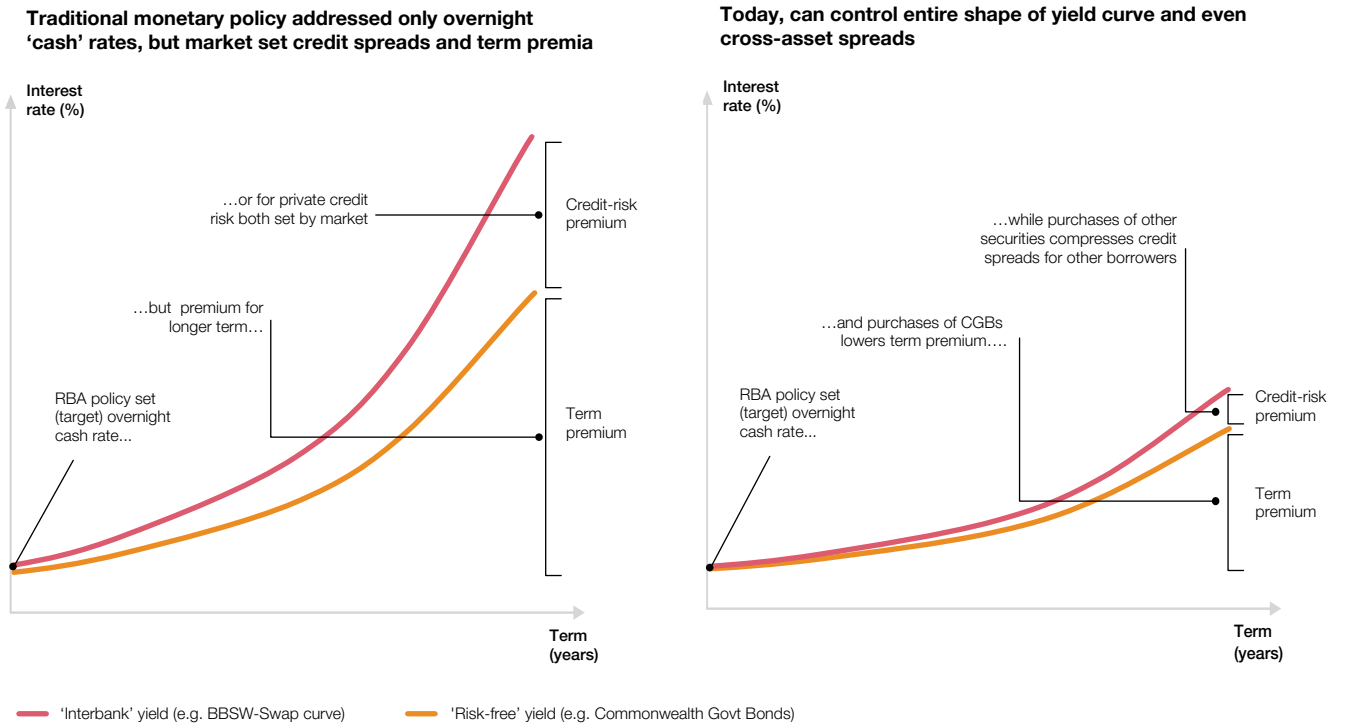
More recently, a number of European markets went further, as illustrated in **Exhibit 3.**

Denmark first took short-term rates negative just over five years ago, followed shortly by the European Central Bank (ECB) in June 2014 and then the BoJ in July. The first negative rates were overnight rates – specifically the overnight rates paid (now charged) to banks for their reserves, which had grown to very high levels since the GFC. The idea was to encourage banks to reduce these reserves and deploy them into the economy, allowing them to profit from the difference between the short-term rates that drove their cost of funds and the longer-term rates at which they lent.[5]

(4) ABC, August 2019.

(5) In June 2014 the German 10-year was still yielding 1.3% and corporate debt even more, so the initial impact of lowering short-term rates on NIM was actually accretive.

Exhibit 4: Central banks able to both lower and flatten the yield curve (strategies under consideration)



What's more, following the example of the US, the ECB and Switzerland complemented canonical monetary stimulus with an aggressive asset-purchasing program (APP[6]), buying longer-dated government and private-sector securities to push down the full yield curve, including those parts that traditionally were not directly controlled by central banks. This is illustrated in **Exhibit 4.**

As a result, in all these markets low rate expectations are embedded and the yield curve is both lower and flatter than it has ever been before.[7]

No *Alice in Wonderland:* negative rates can reflect rational expectations

How can this be? Why would anyone pay to lend someone their money? More than one economist has described this conundrum using Lewis Carroll imagery, yet this is no *Alice in Wonderland* distortion. Markets are implicitly expressing expectations about the future, and these must be for a future that will be radically different than the past.

Throughout history interest rates have been positive because the sum of expected inflation, the opportunity cost of capital, and expected credit loss always vastly outweighed the convenience value of having a creditor hold capital for safekeeping.[8] This is the situation illustrated by the left-hand pane of **Exhibit 5.**

Change assumptions however, as illustrated on the right, and negative rates can make sense.

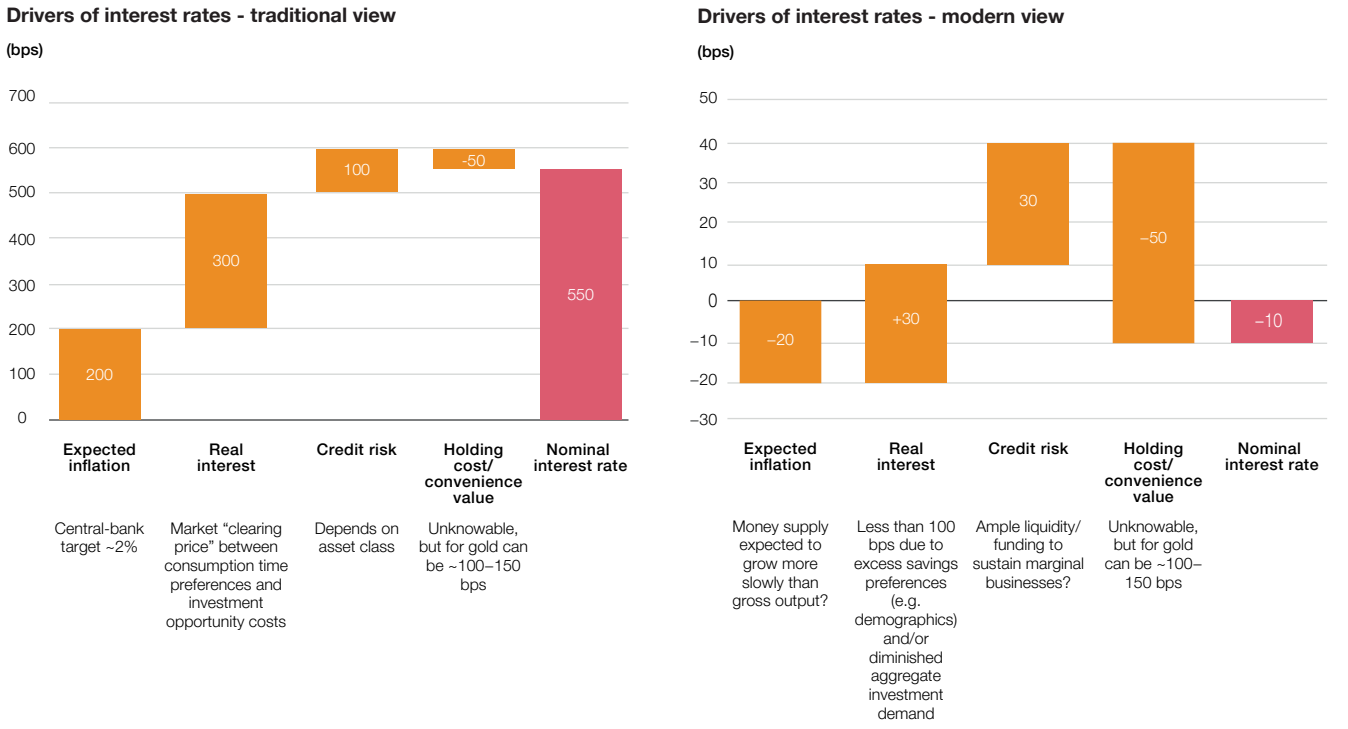
Of course, no one knows what the convenience value of money storage is, but the 50 bps illustrated in **Exhibit 5** is probably conservative.

(6) Similar to what in the US was called 'quantitative easing', although the mix of assets purchased was different.

(7) Globally, over US$16 Trillion in bonds trade at negative yield at this time (reported as of August, 2019).

(8) The convenience 'value' of money storage is sometimes also called a 'cost.' That's because it refers to the cost charged to you by anyone, such as a bank, providing you that value.

Exhibit 5: Understanding nominal rates – four principal components



The market for gold suggests it could be over 100 bps[9] and anyone holding physical currency, knowing the RBA's inflation target is 2-3%, is implicitly agreeing to pay that.[10] What's more, central banks around the world have been taking steps that increase this value. In Europe and India they have withdrawn high-denomination notes. In Greece they put restrictions on bank withdrawals.

In Australia the Currency Bill of 2019, currently under consideration in the Senate, would make illegal high-value cash transactions with any registered business. While such measures may be motivated by anti-crime or other considerations, their effect will be to lower the physical bound on how low a negative interest rate can go.

This lower bound, wherever it may be, is probably lower for a large business or other enterprise, who have no alternative to using the banking system, than it is for private households or small businesses, who have the option of using cash, jewellery and gold.

Thus in a world of negative rates, it may be retail deposits that are more volatile, and wholesale deposits sticky, at least with respect to the banking system overall.

In short, when the ECB asks to be paid to hold reserves, and banks agree, they are implicitly agreeing to the proposition of the right-side of **Exhibit 5**. That is, that the combination of expected inflation, real opportunity cost of capital, and credit risk (let's assume zero in the case of the ECB) are less than the convenience value of storing money.

Do they realise this? More importantly, *are they right?* We turn to this question in **Section 2.**

First, it's important to understand how much scope there could be for unconventional monetary policy in Australia, should that ever be necessary.

(9) Depositors at the Perth Mint, for example, pay 20 bps to buy, 20 bps to sell and 100 bps pa to store their gold. This is because minted gold bars have no opportunity cost, the Perth Mint has negligible credit risk and gold is believed to be an inflation hedge. Thus, for gold, the convenience cost of storage is all we see. In the market for gold secured by a 'risk-free' sovereign entity, 'interest rates' have always been negative.

(10) We don't often think of inflation as the fee the central bank, on behalf of its client, the sovereign, charges us for the privilege of holding physical currency, but that's exactly what it is.

Australia has ample scope for quantitative easing

Australia has many alternatives to manipulating money markets besides continuing to push the cash rate lower. Thanks to the Commonwealth's AAA credit rating and the RBA's relatively simple balance sheet, the RBA has ample room to act. As shown in **Exhibit 6**, were Australia to implement a quantitative easing (QE) program on the scale of that carried out by the US Federal Reserve (prorated for the size of the RBA balance sheet and Australian money supply), it could acquire $400-500b of assets.

As this is comparable to the entire outstanding stock of Australian Commonwealth Government bonds[11], a 'Kangaroo QE' would have to go beyond Treasuries and probably cover a large suite of asset classes.

In short, should the RBA take the cash rate to 50 bps as expected, or even to the 25 bps the Governor Lowe said is the RBA's estimate for the 'effective lower bound'[12], they would have considerable scope for additional easing besides continuing to lower the overnight rate to below zero.

So, would they?

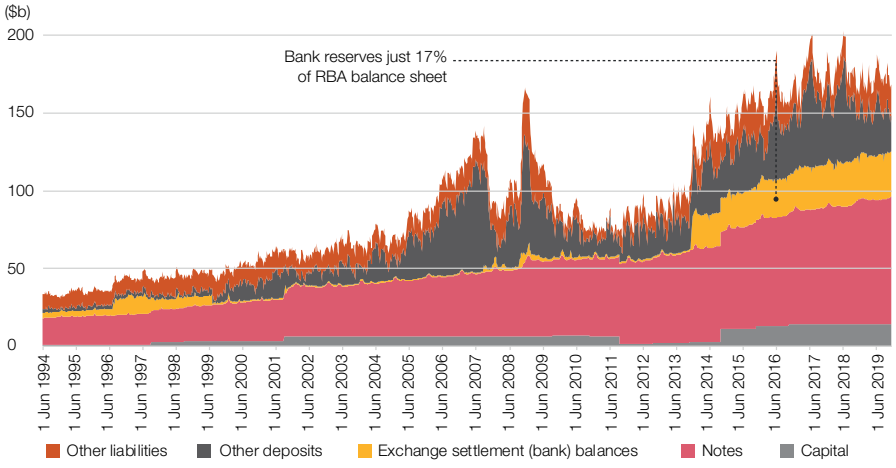
(11) AOFM Investor Update, April 2019

(12) 'Unconventional Monetary Policy: some lessons from overseas', Philip Lowe, RBA, Address to Australian Business Economists Dinner, Sydney, 26 November 2019

Exhibit 6: 'Kangaroo QE' could involve $400-500b in newly-created bank reserves and acquired assets (comparable to $493b outstanding Australian CG Bonds)

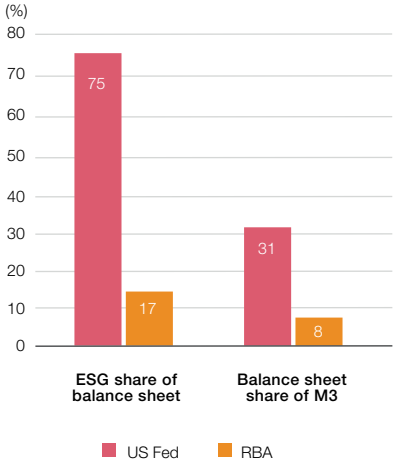
RBA balance sheet liabilities

RBA has significant scope to grow balance sheet and reserves as share of balance sheet...



RBA vs Fed in 2014 (height of QE)

…compared to US Fed at height of QE



Source: AOFM Investor Handout, April 2019, RBA, PwC analysis,

(13) Some Echoes of Melville, Sir Leslie Melville Lecture, Canberra, 29 October 2019.

Whether we like them or not, Australia cannot avoid global trends

It’s safe to say that there is no constituency for negative rates in Australia. Economists and executives have warned of their potential to create perverse incentives, as well as adverse outcomes for many stakeholders in the community and other unintended consequences. We summarise the most important of those in **Section 3.**

For its part, the RBA seems to agree. They have indicated an understanding of, and sympathy with, commonly-expressed concerns about the consequences of low, and especially negative, rates. The RBA emphasise that they have other levers at their disposal, including the ‘unconventional’ monetary policy described in the subsection above.

However, it would be a mistake to equate desirability with probability. The RBA has made clear that it sees its choices as fundamentally constrained by the global environment in which Australia operates. Should the global trend towards lower, and even negative, rates continue, and perhaps even accelerate during another downturn, it is hard to imagine Australia standing alone in resisting NIR.

In short, for banks and their boards, NIR is far more than just a ‘tail risk’ or topic for crisis planning. It is a likely possibility under many plausible scenarios of the medium term. They need to plan accordingly.

02

Serious challenges for financial system

Low and negative rates reflect a view of the long-term future which is far less optimistic than it has ever been. Even if this view is wrong, the consequences of negative rates may leave us with a financial system and global economy that is smaller, less productive and less robust than it would otherwise have been.

One cannot describe the view of the world represented by negative rates (see **Exhibit 5** on page 11) without asking whether such a view makes sense.

There are two common, alternative, answers to that question, which for simplicity we'll call the **'inflection-point'** and **'distortion'** hypotheses.

Inflection-point hypothesis

This is the hypothesis first popularised by former Chief Economist of the World Bank, Larry Summers, in the late 1990s, and later by former Chair of the Federal Reserve, Ben Bernanke, who complained about a 'global savings glut.' [14]

It states that low rates are driven by fundamental structural changes to the global economy, and that that they are here to stay.

Start with inflation, where expectations for low rates can be self-fulfilling and have been firmly grounded for some time. In addition, they are reinforced by well-known structural changes to the political economy (declining union authority, globally-connected labour pools, and technology substitution), which make a repeat of the wage-price spirals of the past hard to imagine, regardless of what happens to the money supply.

(14) The Global Saving Glut and the US Current Account Deficit, Ben Bernanke, The Federal Reserve Board, March 2005.

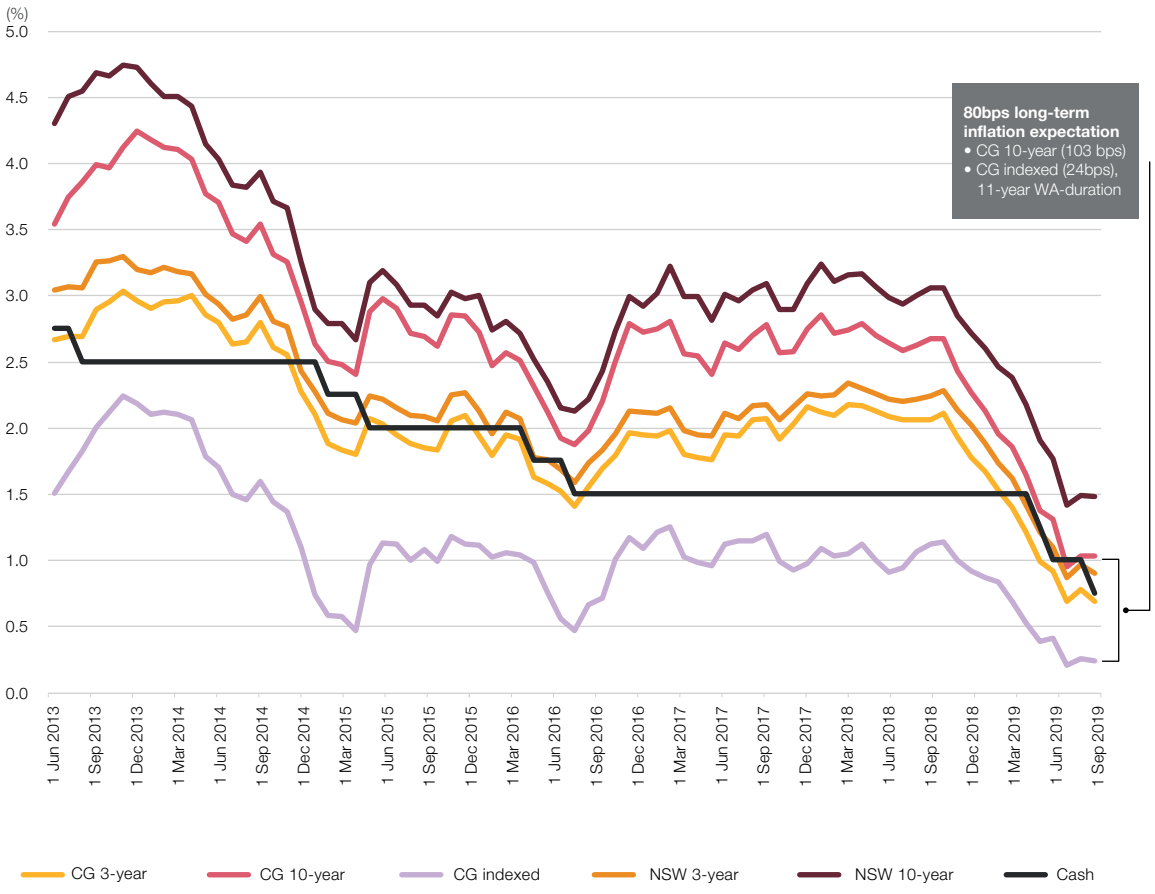
In developed markets, populations are ageing and workforces either shrinking or no longer growing (Australia is one of the fortunate exceptions). These are headwinds to economic growth and tailwinds to the supply of savings that reinforce the global savings glut. Finally, there is an argument to be made that even as the pace of technological innovation accelerates, its incremental impact on our lives diminishes. As remarkable as self-driving cars, virtual assistants and 5G may be, it's not clear that they'll change the world as much as railroads, refrigerators and telegraph wires once did.

In short, what we call the inflection-point hypothesis posits that the era of globally-synchronised 'hyper' progress is coming to an end, and that an era of more gradual economic change is about to begin, one in which per-capita income growth will be measured in basis points rather than as a percent. It's a future similar to the state of the world that preceded the Industrial Revolution, and to that which Japan is experiencing now.

Problems with inflection-point hypothesis

There are problems with this hypothesis. First, it leaves much unexplained. Is it realistic that future inflation expectations remain low in a world where central banks purchase private financial assets with reserves they create? Is it sensible to believe that in a world where 3.4 billion people live on less than US$5.50 per day, the real opportunity cost of capital is so small, even when breakthroughs in artificial intelligence, genetics, biotechnology, nanotechnology, quantum computing and clean energy promise so much?

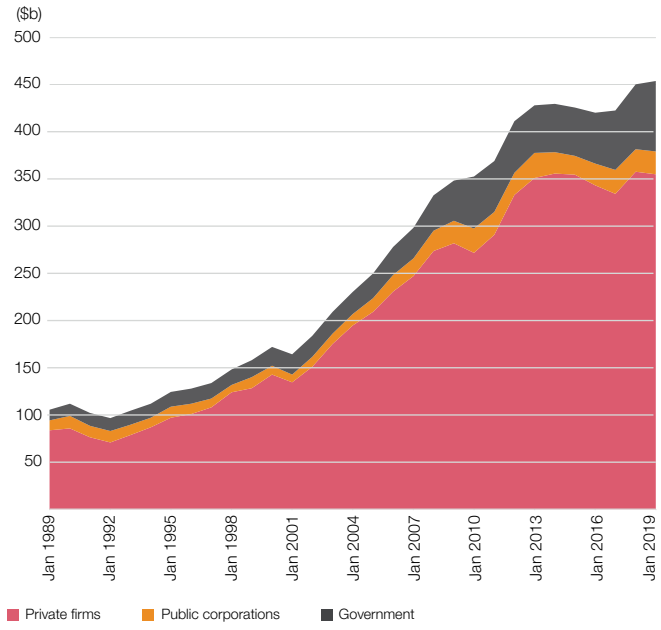
Exhibit 7: Inflation expectations are not negligible – even if not at RBA target



Source: RBA, PwC analysis

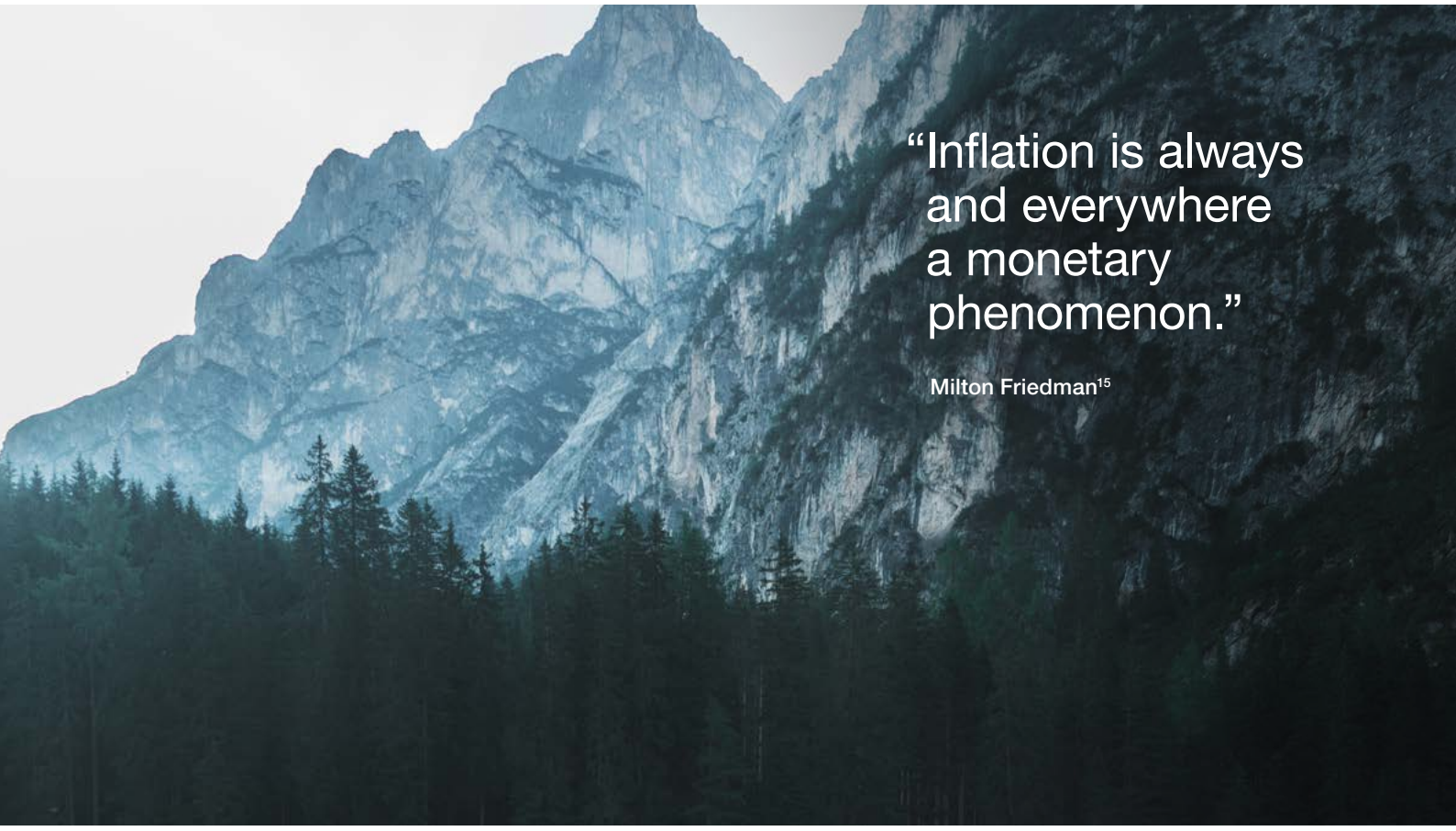
Exhibit 8: Where's our 'savings glut' in Australia?

Gross fixed capital formation has been flat for five years…



…but it's not because there is too much savings. Household savings ratio approaching pre-GFC level

Source: Australian Bureau of Statistics (ABS), PwC analysis



(15) The Counter-Revolution in Monetary Theory, Milton Friedman, 1970

Second, it does not conform to all the data. Start with inflation. As shown in **Exhibit 7**, a comparison of 'risk-free' Australian government bond with the yield on a portfolio of inflation-protected 'indexed' bonds (yielding 24 bps over a weighted-average duration of 11 years) suggests inflation expectations over that time horizon of ~80 bps. Whilst that is not high, it's probably not consistent with negative nominal rates, unless one were to accept negative real rates as well. As for the so-called 'savings glut', whilst there may be one overseas, it's hard to find it in Australia. Here, fixed capital formation has been flat and household savings have been falling for a number of years, as shown in **Exhibit 8.**

Finally, consider the proposition that inflation expectations are 'entrenched'. This is certainly true for common measures of inflation such as the Consumer Price Index (CPI), a measure of price changes in a portfolio of goods known as the 'consumer basket'. But that's because that's not where the money has been going.

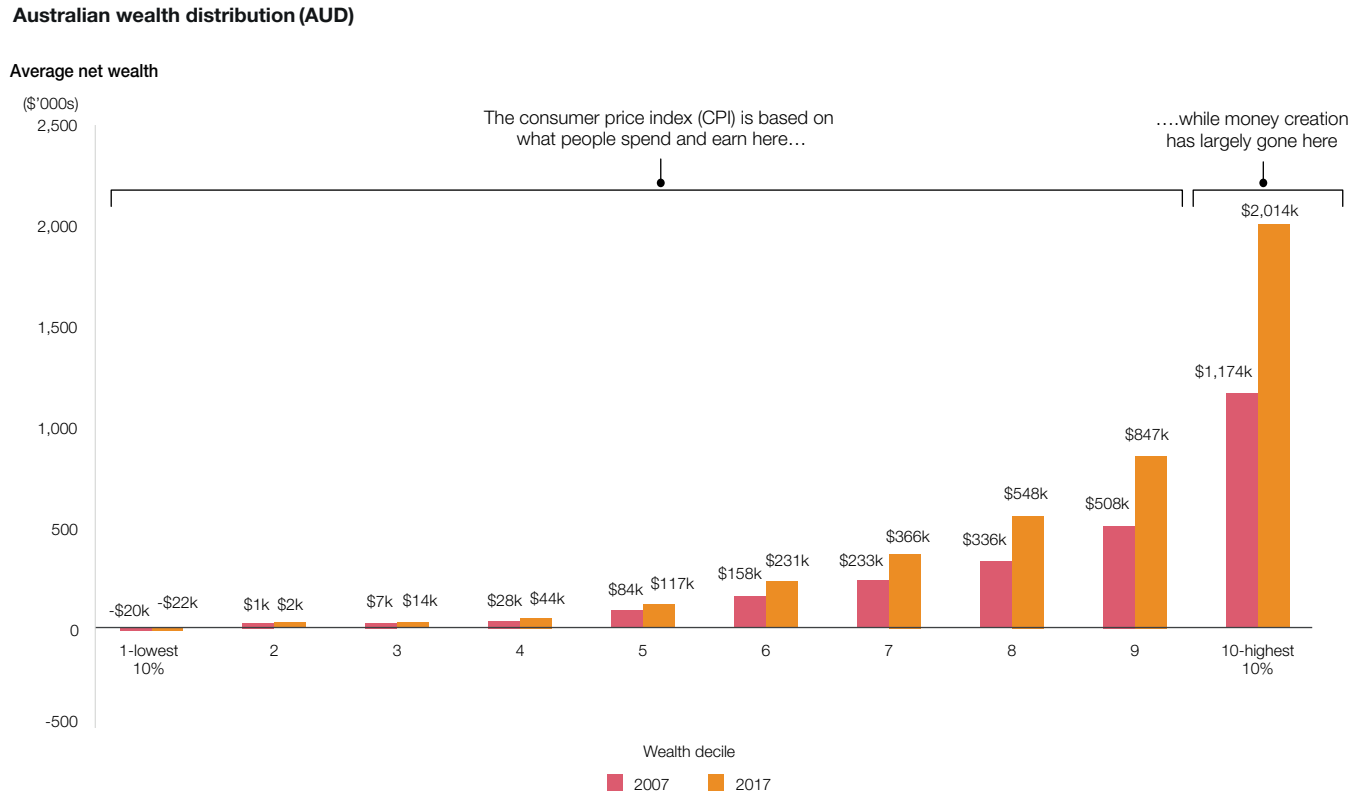
Exhibit 9 illustrates the shift in the Australian wealth distribution over the decade to 2017. As can be seen, the impact of money and wealth creation over this time was concentrated in the top 10% (and even more concentrated in the top 1% and 0.1%).

So if the money has been going to the so-called 'one percent', what has happened to their 'consumer basket?' Of course, that's dominated by things we don't consider to be 'consumer goods', or at least not basic ones: property, shares, jewellery, bonds, art, private education, private healthcare, gold, and, most of all, luxury.[16]

As is well known, the cost of all such things has been growing at astonishing rates. Some of these are illustrated in **Exhibit 10.**

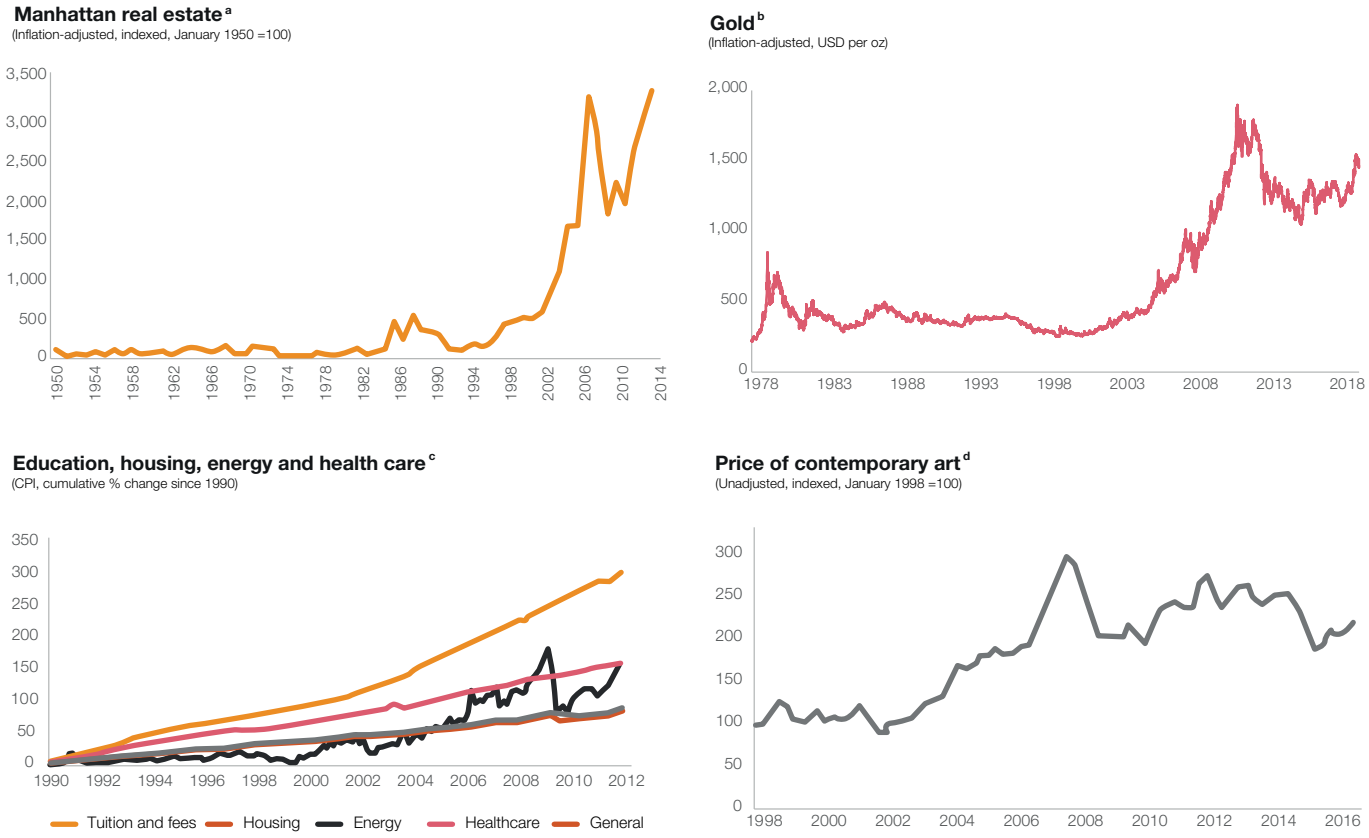
(16) Less than twelve months ago a bottle of Grange was sold for more than $80,000, beating the prior one-bottle record set just a few months before by more than 2%. It's obviously not CPI, but at 2% per quarter, it's inflation.

Exhibit 9: You won't find inflation in the consumer basket



Source: RoyMorgan Research: Wealth Inequality in Australia is getting worse, 21 September 2018.

Exhibit 10: Where the money is: inflation for the 'one percent'



(a) Tom Nichol Nicholas, Anna Scherbina, Harvard University, RealClear Markets, Manhattan Real Estate: What's Next?, February 8, 2016.
(b) Macrotrends online.
(c) BLS, Moody's Analytics.
(d) ArtPrice.com.

Distortion hypothesis

There is another explanation for the meagre expectations illustrated in **Exhibit 5**. The 'distortion hypothesis' lays the blame squarely with central banks. By growing their balance sheets, pushing down rates and artificially manipulating the yield curve, the theory goes, our RBA muzzles the signals on which markets depend to allocate capital and, just as importantly, take it back when it is unproductive so that it can be put to better use.

This leads to suboptimal decisions about consumption, savings, investment and capital allocation, pushing down growth, productivity and long-term prosperity.

Stimulus (alone) hasn't had the impact policymakers seek

It's not within the scope of this paper to resolve or even take a position on this debate.

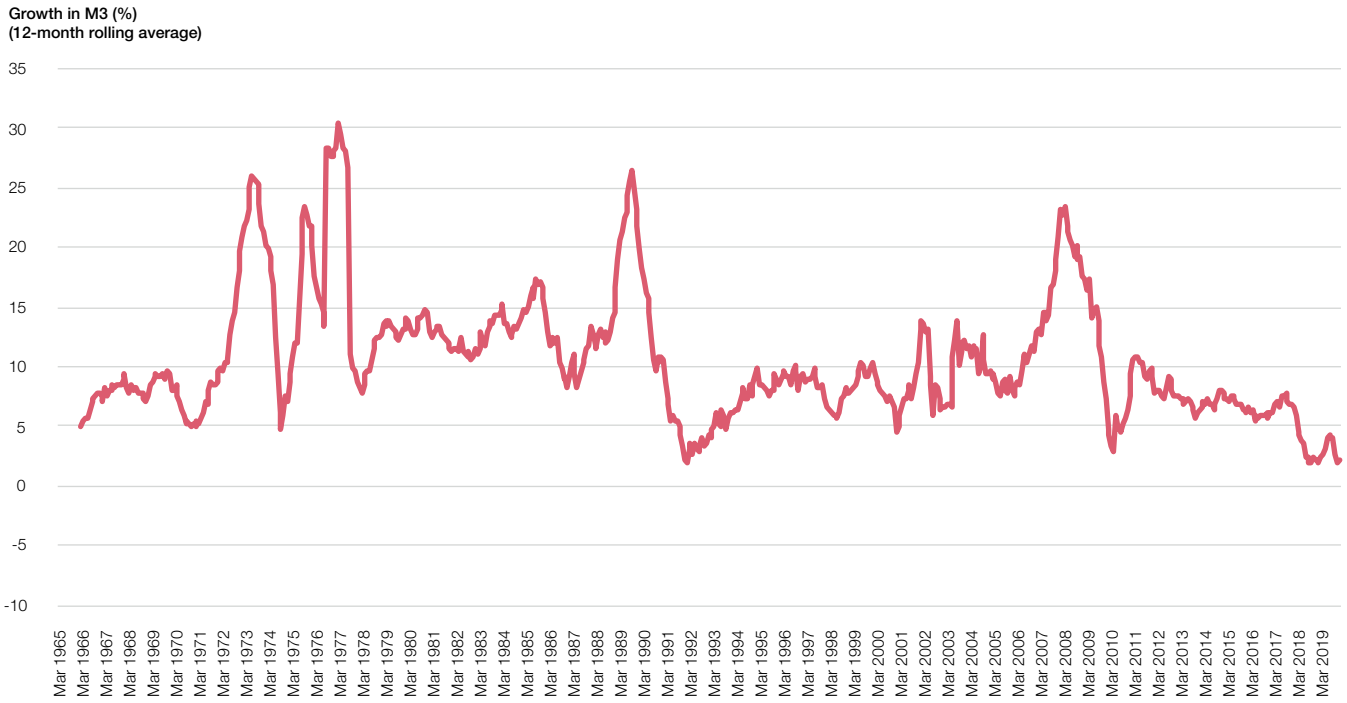
However, we would point out that the two 'world-views' described above will have very different consequences for asset values, relative value and optimal business strategy. We discuss some of these differences in **Sections 3 and 4**.

In the meantime, it's worth noting that, so far at least, monetary stimulus in Australia hasn't delivered everything it was supposed to. Start with the most basic: expansion of the money supply.

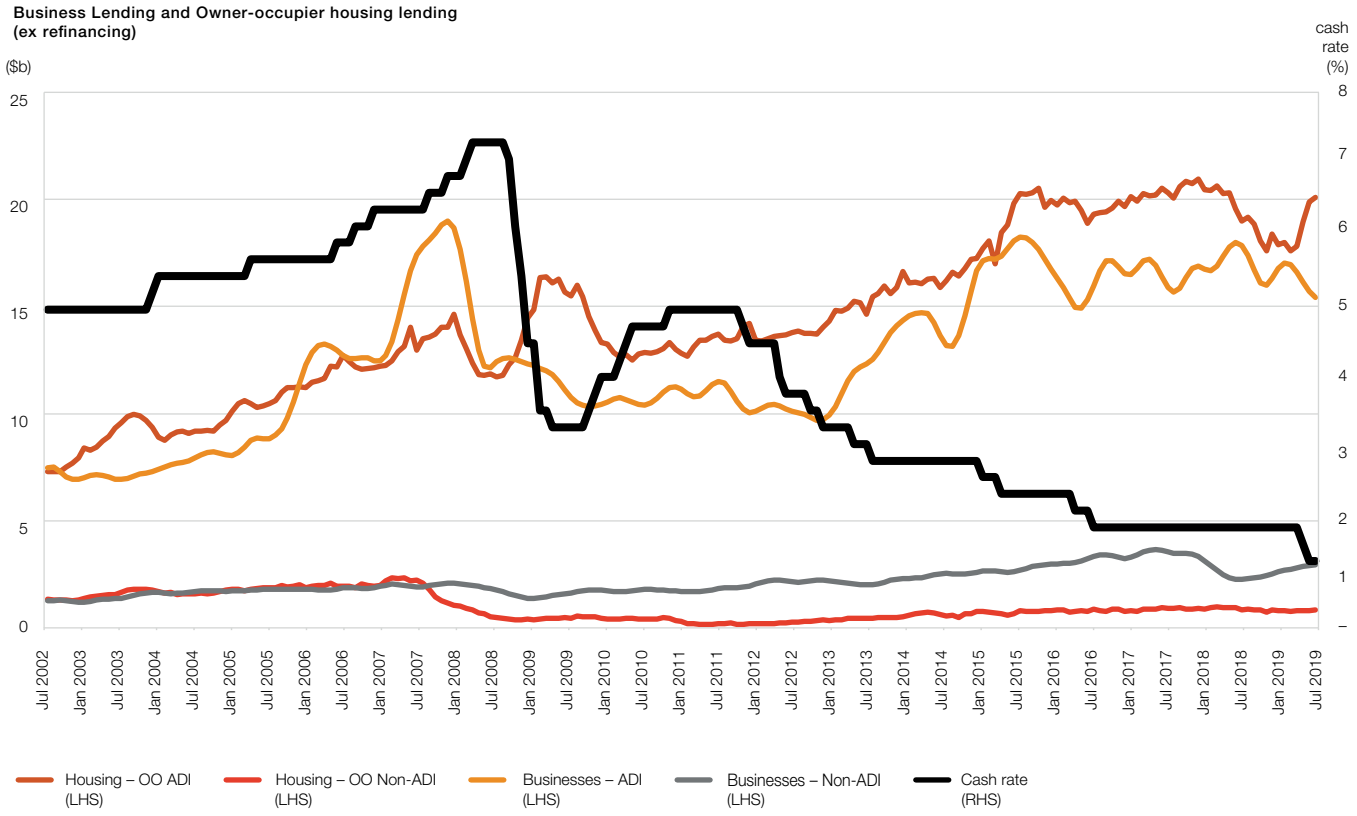
Although it's impossible to prove the 'counterfactual' (i.e. what would have happened had there been no stimulus), it cannot be denied that growth in the money supply continues to slow along with lending. This is illustrated in **Exhibit 11** with focus on the two most important markets from a volume perspective: business lending and owner-occupier mortgages. In other words, while the RBA has significantly expanded its balance sheet over the past decade, banks haven't followed suit, and it is the banks, not the RBA, which create most of our money.

Exhibit 11: Easing has not (yet) stimulated credit growth and money creation

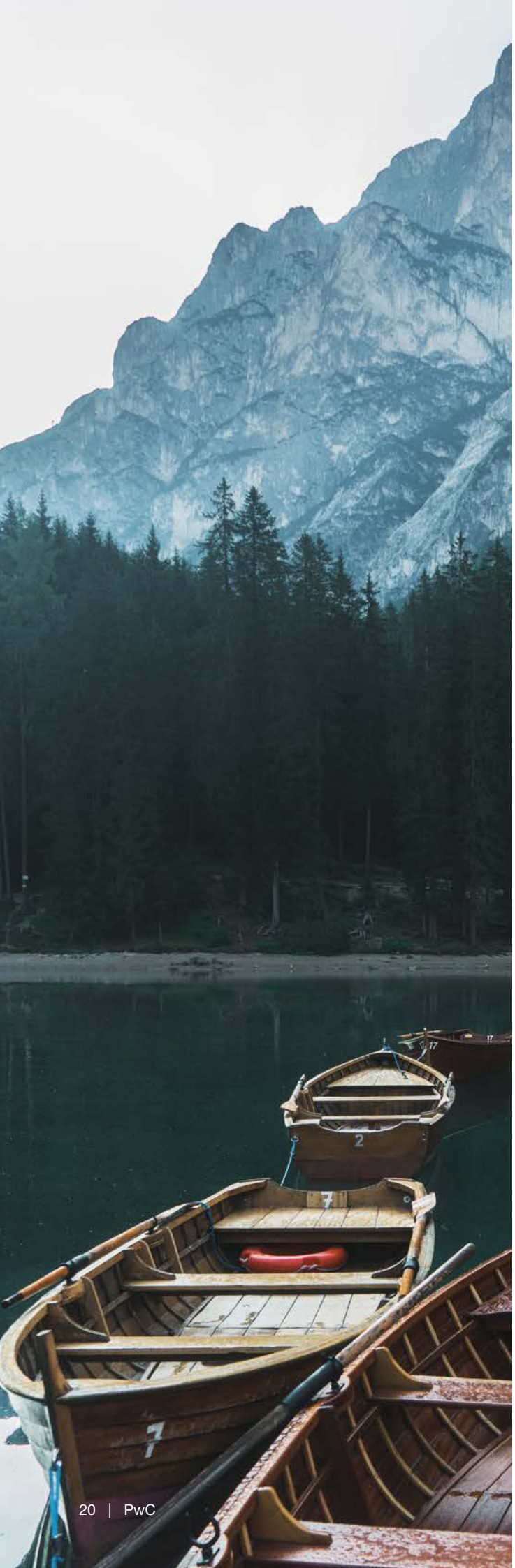
Money supply (M3) growth has continued to slow…



…as business and mortgage (OO) net lending remains stuck at ~15-20b per month since 2015



Source: RBA, PwC analysis



This is commonly blamed on businesses failing to invest, which itself is blamed on consumers failing to spend. However, before we blame consumers, let's look at the impact of lower rates on them. Notwithstanding the evidence that household savings have actually decreased, there is no doubt that the pressure for savings has gone the other way. Consider two significant needs: saving for retirement and saving for a first home. **Exhibit 12** illustrates the increase in required lifetime savings for someone hoping to preserve 60% of their average lifetime income through retirement. Just a 200 bps reduction in real, after-tax lifetime average return (i.e. including recessions and corrections) means that the required lifetime savings rate doubles.

A renter contemplating buying their first home faces an additional challenge. Despite the common belief that lower rates make mortgages more affordable, this is not the case when the impact on house prices is taken into account.

Exhibit 13 illustrates a hypothetical scenario of someone paying $1,000 per month renting a home which they are hoping to buy. As rates fall (and on the assumption that the rent remains 'sticky' but mortgage rates and rental yields fall proportionally)[17] then the principal to be financed and the required monthly payment both rise. As shown, the impact of each rate cut on aspiring homeowners becomes steeper the lower rates get.

What's more, since today's home buyer is tomorrow's mortgage holder, the increased debt can act as a drag on consumption for years to come, regardless of what happens to asset prices.[18]

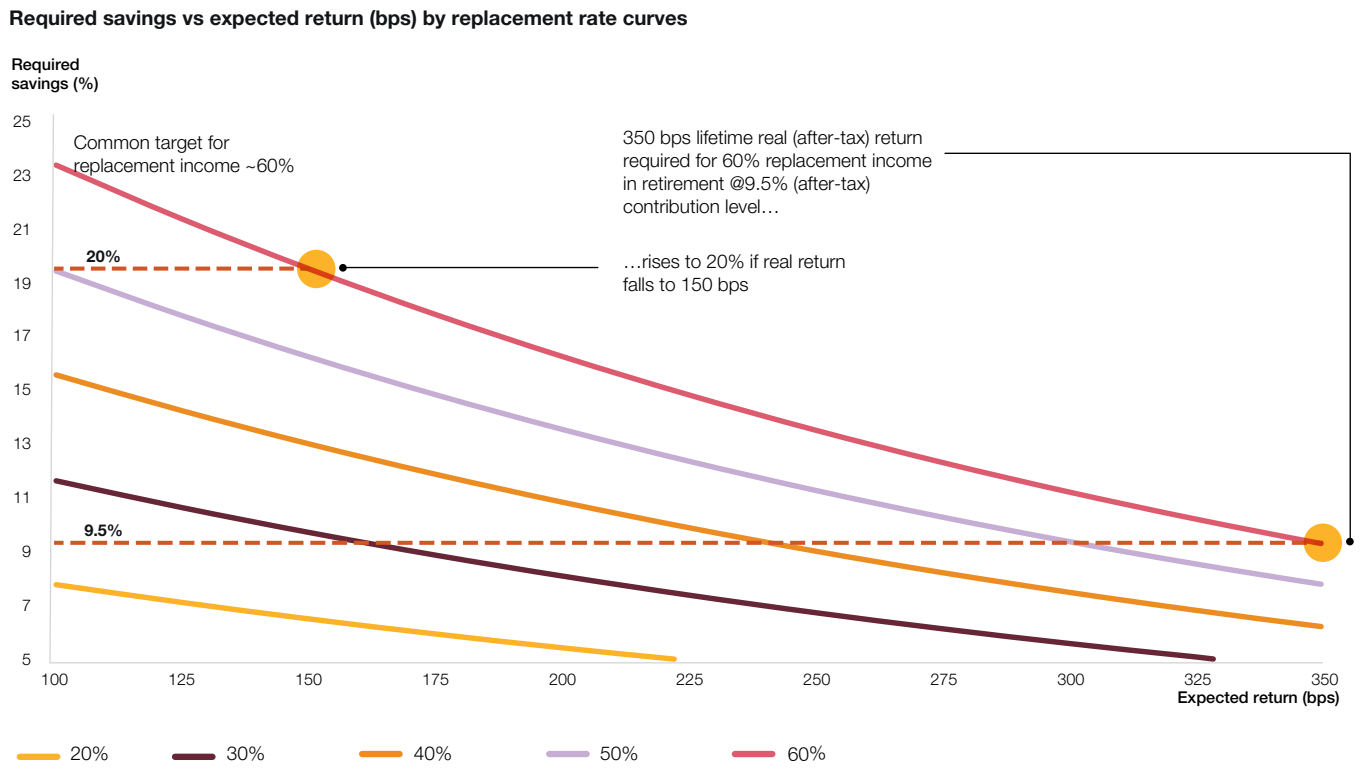
For all these reasons, this period of low rates has been associated with constrained consumer demand, subdued business investment and wage pressure, notwithstanding healthy employment. As one might imagine, given the contrast between required savings and actual savings described above, this period of low rates has also been associated with elevated levels of social anxiety, anger and resentment.

Needless to say, all these have affected the banks.

(17) Or, in the language of investment property, cap rates rise proportionally.

(18) This is the so-called 'mortgage overhang' which was observed by the RBA to constrain spending even if the asset, and hence the borrower's net worth, rises. See 'The Effect of Mortgage Debt on Consumer Spending: Evidence from Household-level Data', Reserve Bank of Australia, July 2019.

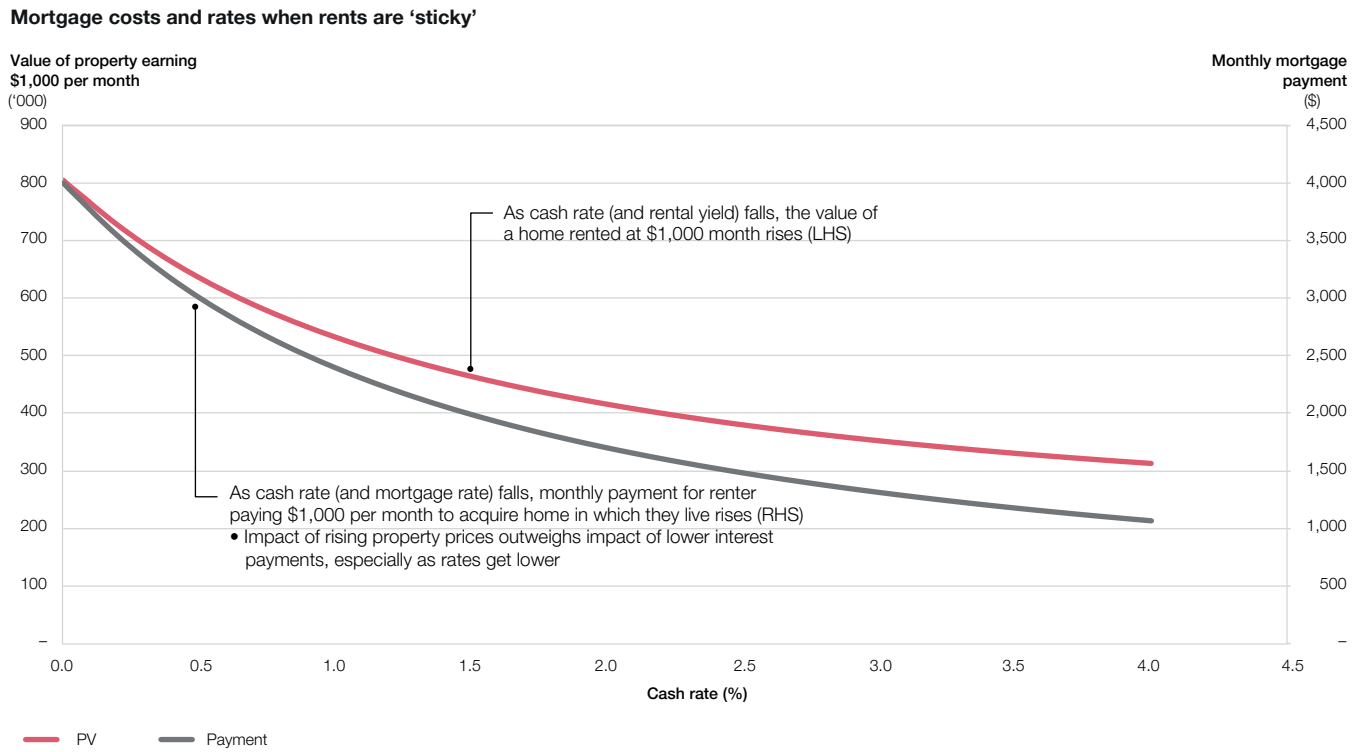
Exhibit 12: Substantial implications for everyone saving for retirement[19]



Source: PwC analysis; assumes 45-year working life and 25-year retirement; flat income, savings rate and real return throughout life and equal average tax rate

(19) For simplicity all analysis is performed on an after-tax basis. Differences in tax and superannuation policy and circumstances will change what this means from a pre-tax perspective.

Exhibit 13: Substantial implications for anyone wanting to buy a home



Source: PwC analysis; assumes gross rental yield of cash rate + 150 bps and 20-year mortgage at cash rate + 200 bps

Financial system may become more vulnerable the longer this continues

What happens if the trend towards lower or negative rates continues? This is the so-called ‘lower-for-longer’ scenario, and noting the impossibility of proving counterfactuals mentioned above, we can say that we expect many of the adverse consequences mentioned above to accumulate and compound.

This is illustrated in **Exhibit 14,** which highlights that for all the obvious benefits of quantitative easing in immediately arresting a financial crisis, these may become overshadowed by unintended consequences the longer it lasts.

This is because while monetary stimulus encourages investment, it can provide incentive for risk taking which may or may not prove to be wise. We are already seeing some of these consequences overseas. According to the Bank of England:[21]

- The number of loans with limited or no borrower protections (so-called ‘covenant lite’) has increased threefold since before the GFC to more than $3.4T,
- More than $30T in assets are held in money-market-like instruments that provide on-demand access to funds invested in long-dated assets, just like a bank account but without government guarantee,
- Almost half (40%) of ‘leveraged’ loans are held by non-banks, and
- The share of the most highly-leveraged loans (>7X) is almost 30%, a ratio underestimated by almost 40% due to the copious use of so-called ‘add backs.’[22]

As with the issues described in the point above, all these trends pose challenges for banks, regulators and other stakeholders which may not become fully apparent until such time as the monetary stimulus must be unwound.

In such an environment, judicious macro-prudential regulation may be especially important.

(20) Sir Jon Cunliffe, ‘Financial Stability and Low for Long,’ European Central Bank, 14 October 2019.

(21) Ibid.

(22) ‘Add backs’ are terms which allow borrowers to pro-actively add back certain quanta to their calculation of earnings for the purpose of leverage reporting. Examples are forecast merger synergies and restructuring costs.

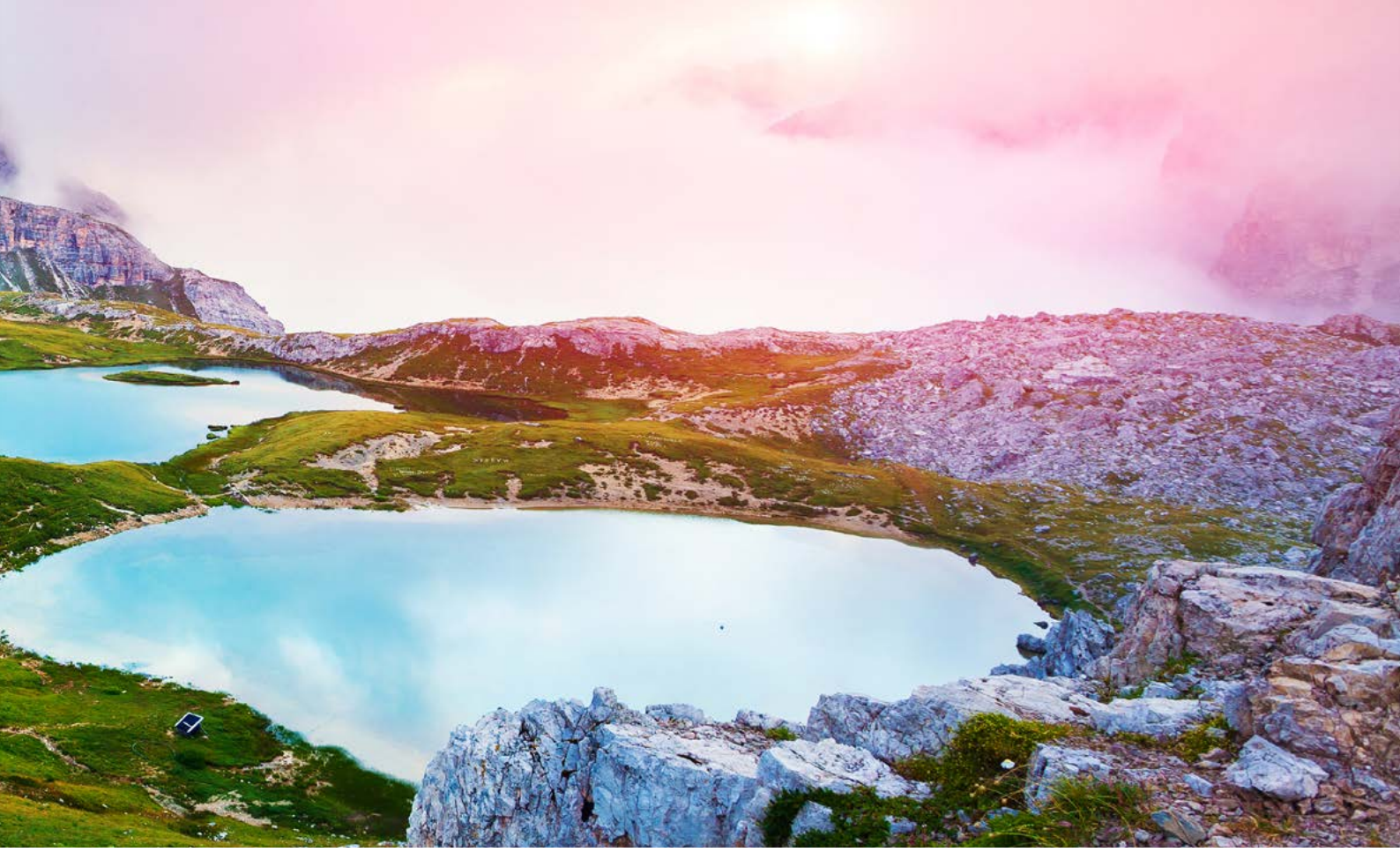


Exhibit 14: Potential unintended consequences of monetary stimulus grow as time horizon expands

Short-term boost

Needed liquidity and capital to avoid failure

Benefits to banking system and banks:

- Increase in liquid reserves
- Mark-to-market gains on assets held for trading
- Realised gains on assets sold to central bank
- Increased spreads as shorter-dated liabilities roll over faster than assets
- Lower credit risk costs as at-risk borrowers obtain liquidity

Medium-term drag

Lower returns and income as new assets replace old

Costs to banking system and banks:

- Lower returns from reserves that replaced bonds
- Lower spreads as loan rates fall farther than funding costs (zero lower bound)
- Slower growth as businesses curtail borrowing and other activity

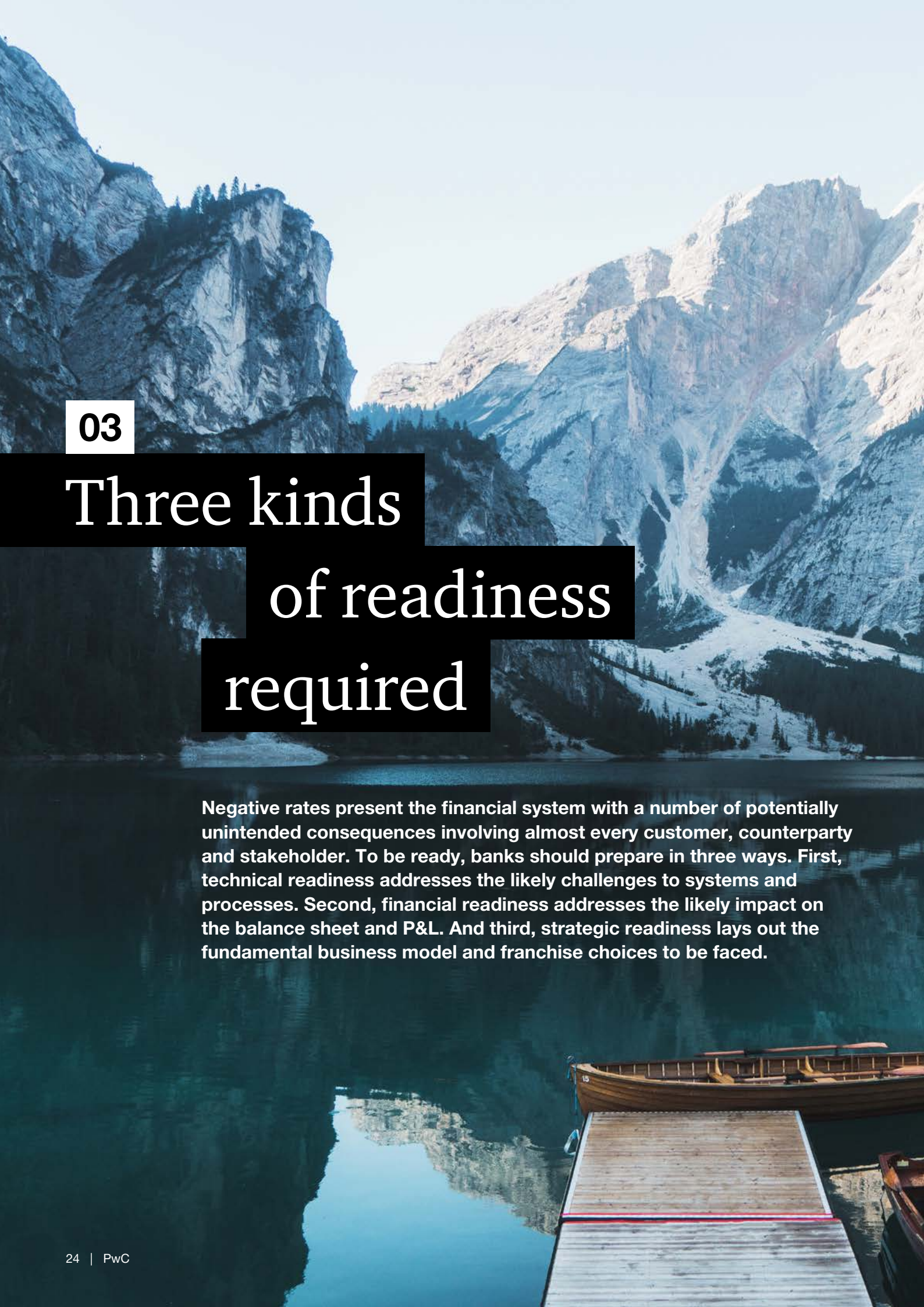
Longer-term distortion

Materiality of altered capital allocation accumulates

Impact on financial system:

- Greater leverage in corporate balance sheets
- Higher risk-profile (leverage and asset mix) in household balance sheets and investment portfolios
- Eroded borrower protections (e.g. Covenant Lite leveraged loans)
- Accelerated disintermediation of more regulated sectors (banks)

Source: PwC analysis

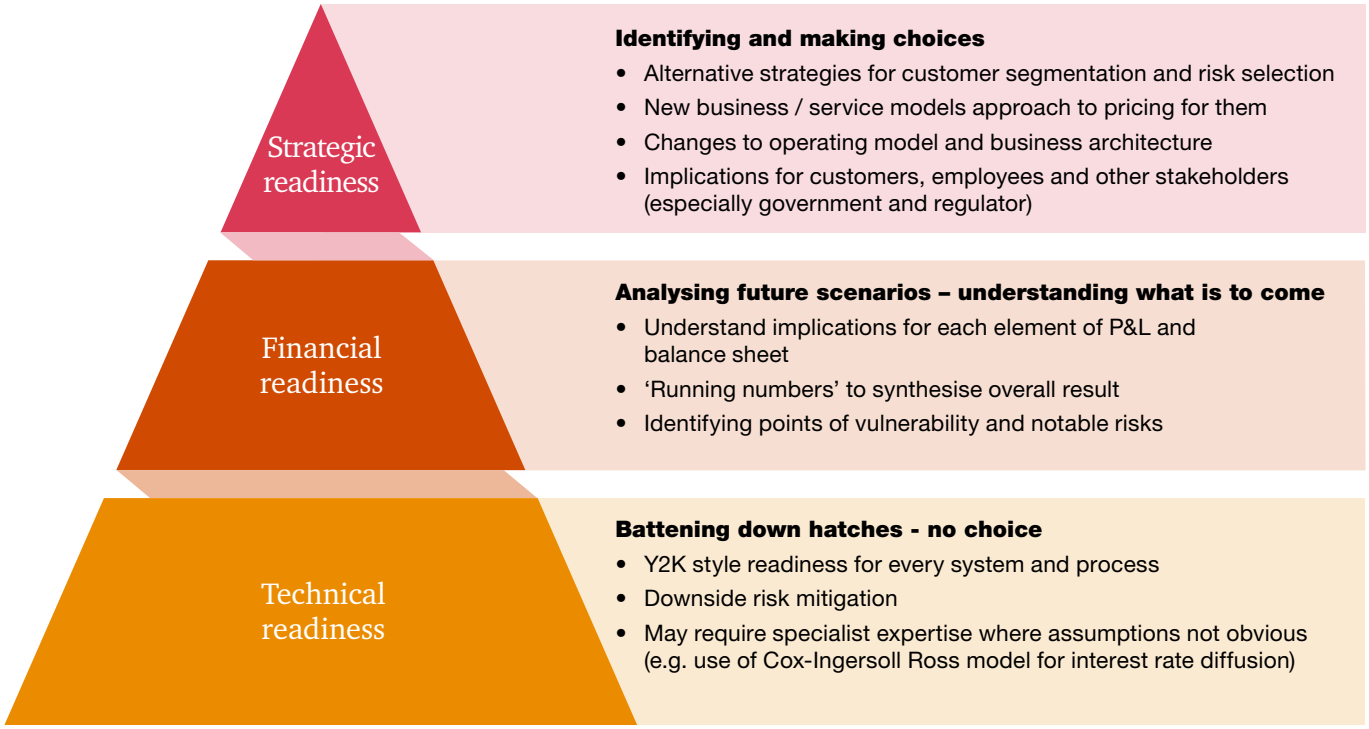


03

Three kinds of readiness required

Negative rates present the financial system with a number of potentially unintended consequences involving almost every customer, counterparty and stakeholder. To be ready, banks should prepare in three ways. First, technical readiness addresses the likely challenges to systems and processes. Second, financial readiness addresses the likely impact on the balance sheet and P&L. And third, strategic readiness lays out the fundamental business model and franchise choices to be faced.

Exhibit 15: Technical, financial and strategic readiness required



There is a broad variety of issues requiring attention by banks preparing for negative or very low rates. At the most basic level, banks need to ensure that technical systems and processes designed in a world where negative rates were deemed to be impossible are still fit for purpose. Next, the impact of lower or negative rates on every item of the balance sheet and P&L needs to be understood, not only from the perspective of the enterprise as a whole but also from the vantage point of specific customers, segments and other stakeholders. Finally, important strategic choices must be identified, options created and understood, and, where appropriate, judicious bets placed. These are illustrated in the schematic of **Exhibit 15**.

Technical readiness

There is a 'Y2K' aspect to being ready for negative rates, as an enormous number of models, reporting systems, contracts and processes were designed by people who (wrongly) believed interest rates could only ever be positive.

Floating rate loans (with interest-rate floors) hedged with swaps (which likely don't have them) may expose customers to cashflows and accounting issues they never anticipated when arranging their financing.

Treasurers attempting to 'delta-hedge' portfolios of loans (some of which may or may not have embedded floors) will struggle to ensure they get the settings right.

Traders relying on a broad sweep of fundamental market models may find these models fail to work, or produce traditional metrics like value-at-risk, implied volatility, portfolio convexity, duration and even capital which require adjustment before interpretation.[23]

(23) Most 'standard' models underlying derivative valuation and portfolio monte carlo simulation such as Cox-Ingersoll Ross for interest-rate diffusion, Black-Karasinski for the term structure of interest rates, Black-76 for the pricing of options and many others are grounded in an interest-rate process which was strictly positive and so feature exponentially large deviations as rates go to zero.

Sometimes the relationship between rates and use is extremely indirect. Consider retail credit. Most models rely heavily on borrower behaviour, which remains by far the best predictor of credit quality. With a negative rate, the quality of a loan that did not require some regular payment from the borrower would be extremely difficult to assess until the principal were paid. For long-term loans like mortgages, this might run against the spirit, if not the letter, of the requirements for being accredited as Advanced IRB.[24]

The list of examples is endless. Suffice to say it potentially includes every major area and system in the bank, and certainly includes every category of risk.

Financial readiness

Whilst 'technical readiness' ensures, for example, that systems are prepared to charge fees for deposits and pay interest on loans, 'financial readiness' ensures banks are prepared for the business and financial impact. How will the economics work, given that loan volumes outstrip deposit volumes by a wide margin for Australian banks? What will the impact on volumes be, and how can you react?

Here in Australia, the largest asset on bank balance sheets is residential mortgages, and a move to negative nominal rates could profoundly change the operation of the housing market. It's happened already in Denmark – where Jyske became the first bank to offer a 10-year mortgage at negative 0.5% (not counting charges and fees). Other Scandinavian banks have announced plans to follow. The proposition is simple enough: Jyske earns income from issuing mortgage-backed covered bonds, so needs mortgages to issue them. Danish mortgages are a safe store of value, cost 0.25 bps less than reserve deposits, and the spread to the negative bond rate still allows them to earn a profit, plus fees charged for services to the borrowers with whom they establish or maintain a relationship.

As mentioned above, given the importance of regular payments, a negative mortgage rate might be incompatible with an interest-only (IO) mortgage, unless there were a very significant monthly fee. As a result, borrowers on IO might find their monthly payments go higher if required to transition sooner than expected to Principal & Interest (P&I).

Finally, continuing on this same thread, were mortgage rates to become negative, then negatively-geared investors will lose their tax shield. All other things being equal, investors would presumably prefer to pay tax on an income than enjoy a deduction on a loss. But some investors (perhaps taking note of the implications for future capital gains implicit in a negative rate as described in **Exhibit 5**) may decide this is the time to deleverage their balance sheet.

In short, the impact of further cuts for credit markets, bank balance sheets and P&Ls may not be easy to anticipate.

Strategic readiness

Finally, banks need to think about what fundamental choices will need to be made. The list runs the gamut.

For pricing, should a negative rate be offered as a payment, or a reduction in principal? How would one treat an 'offset' account? Can institutional and corporate customers be charged more than consumers and small businesses for deposits, given their more limited options? And, if so, should the 'stickiness' of large, wholesale deposits be reconsidered?

For customer strategy, how should the bank support customers likely to be especially vulnerable in a scenario of low to negative rates (such as insurers, pension funds and asset managers) and how should one determine which might no longer be viable?

For risk, what are the opportunities to innovate in the modelling and operation of credit risk (described above), anti-money laundering (which may require a different allocation of focus in a world where one pays to deposit but can get paid to take out a loan), liquidity risk (for the same reasons) and market risk?

As with other areas, the list is too extensive to address in a single report.

(24) Internal Ratings Based – the most advanced standard for credit-risk modelling practice as specified by APRA and the Basel Committee.

Signal, stock and flow

Facing such a formidable list, one helpful mnemonic is to consider the potential impacts of low or negative rates for every element of the P&L, balance sheet (on and off), risk category and stakeholder through the lens of the role of interest rates as either:

1. **Signal: information-flow considerations**
   How to make use of interest-rate information and whether that remains relevant in a zero-rate world; how customers may react to the signal of negative rates, and what that means for banks' relationships to them.
2. **Stock: asset and liability considerations**
   The magnitude of resources on both asset and liability sides of the balance sheet, their (discounted) values and associated requirements, such as collateral, posted margin, payments, and fees. Also, just as importantly, one should consider the effect on 'off-balance sheet' factors, such as contingent liabilities and other second-order effects.
3. **Flow: cashflow considerations**
   The impact on the flow of funds.

This reflects the three roles rates play in our economy, as illustrated in **Exhibit 16**

Exhibit 16: Signal, Stock and Flow – the roles interest rates play in our economy

Signal

Rates transmit information

- Time preferences for consumption (e.g. deposit rates)
- Opportunity costs for investment (cost of capital and return benchmarks)
- Guide decisions about trade-offs (investment hurdle rates)
- Other information (implied volatility, portfolio duration, etc.)

Stock

Rates help determine volume and value

- On-balance sheet assets and liabilities
- Off-balance sheet assets and liabilities (loan collateral, contingent liabilities, value-at-risk, etc.)

Flow

Rates guide flow of capital and liquidity

- Interest income
- Interest expense
- Credit origination
- Deposit and transaction account flows

04

Getting started: no-regrets actions to take

Regardless of the outlook for rates, there are a number of steps for banks and their stakeholders to undertake today which will serve them in good stead. These include:

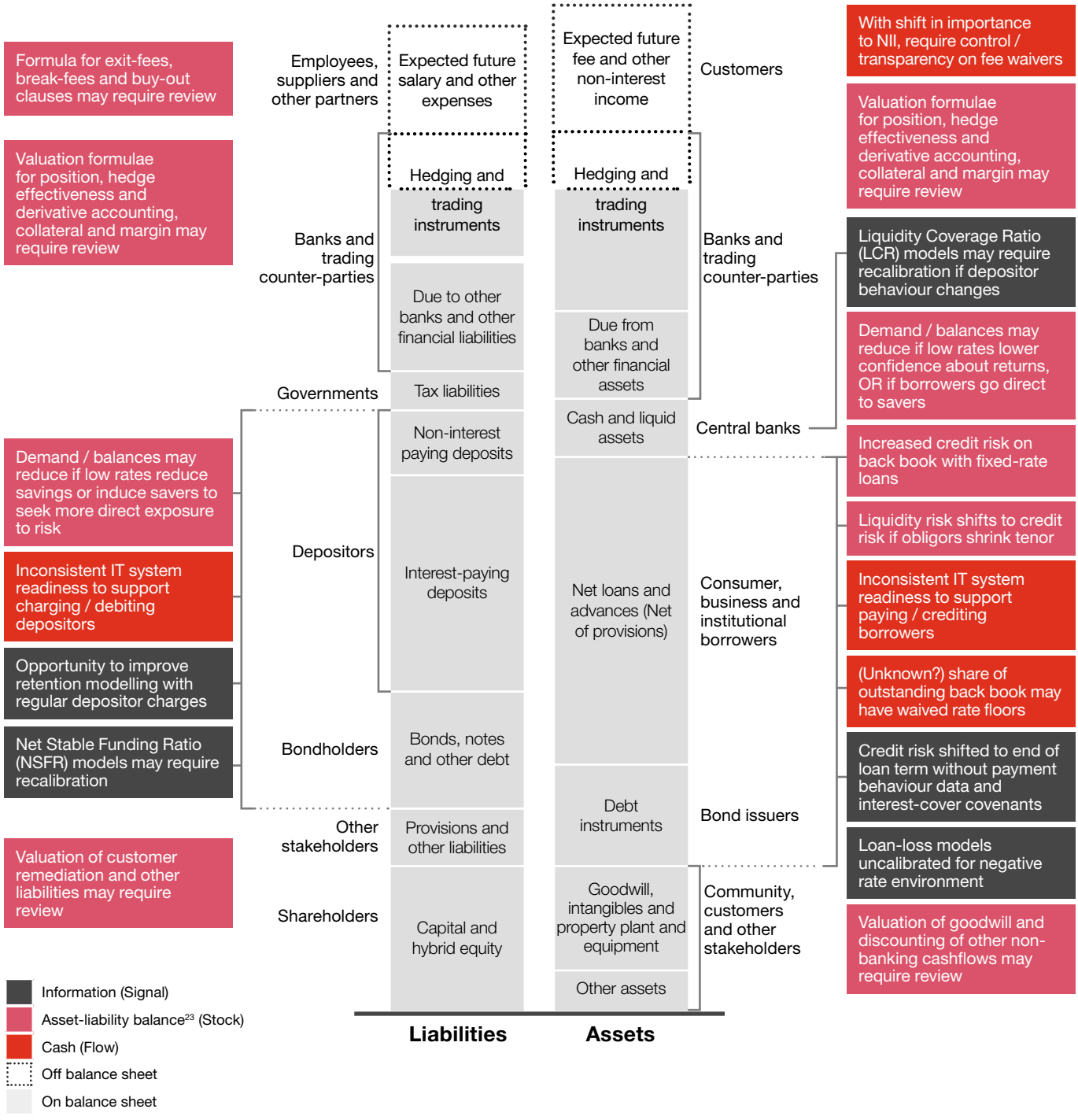
- **Ensuring readiness (as described in Section 3)**
- **Getting fit to compete by addressing cost structure, simplicity of operating model, strength of credit portfolio and balance sheet,**
- **Positioning to thrive by identifying the services customers value, and**
- **Identifying the customer segments aligned to the uniqueness of each bank's franchise, as well as the partnerships and capabilities required to deliver.**

In light of all the uncertainty and complexity described above, there are a number of key things to do to get started.

Ensuring readiness

Obviously, ensuring readiness, especially technical readiness, is a useful place to start. **Exhibit 17** illustrates what a signal, stock and flow framework might reveal when applied across each element of the (extended) balance sheet.

Exhibit 17: Ensuring readiness: Signal, stock and flow framework across extended balance sheet [25]



Source: PwC analysis

(25) Including the explicit and implicit value of loan security / collateral, expected future fees earned, paid and other expenses. Source: PwC analysis.

Getting fit to compete

Having assured readiness, the next imperative is to prepare the franchise, operating model and balance sheet for resilience in the face of challenges to come.

Cost structure and operating model

Obviously, cost is already a key focus for bank executives today. However, accelerated margin erosion, driven by rate changes, may impact the equation for many trade-offs accepted today. What additional costs could be outsourced, consolidated into industry utilities, or simply discontinued if they had to be? What opportunities to streamline the product offer, operational architecture, and operating model exist already? How much more urgent would NIR make them?

Credit portfolio

Section 3 summarised some of the technical ways that credit portfolio management and risk modelling will need to be reconsidered in light of diminished interest income and cash flow from obligors. There will also be a need to reassess exposures in light of the challenges to come, especially for pension funds, insurers, asset managers and other holders of long-dated assets. This is especially true for businesses leveraged to assets such as commodities (especially precious metals), real estate, farmland or other assets (patents, trademarks, etc) whose value can vary significantly with changes to the money supply and inflation expectations.

Balance sheet

Just as with credit, many aspects of balance sheet management may also merit reconsideration. Some of the technical considerations were illustrated in **Section 3.** In addition, a move towards NIR may change the growth orientation for the balance sheet overall, from asset gathering to deposit gathering, as was the case in the immediate aftermath of the GFC. Most importantly, the entire balance sheet will have to be stress tested under multiple scenarios, but especially the two presented in **Section 2** (Distortion and Inflection Point).

Positioning to thrive

Finally, decisions must be made to help ensure the bank can thrive in the new environment. This includes identifying services to generate sustainable fees and other operating income for customer segments aligned to the franchise, as well as ensuring partnership and capability in place to deliver.

Fee and service offer

A NIR-driven cut in interest income would elevate the importance of fees and other non-interest income in a way we haven't seen in a generation. As a whole, these have been on a downward trajectory, driven by changing societal expectations, business divestments and regulatory scrutiny. Of course, the impact of flat or falling other operating income has been mitigated by the 'cross-subsidy' of rapidly growing interest-income, driven by balance sheet growth. As a result, non-interest income for the major banks represented just over 23% of income in 2019.[26] This is a record low for Australia. Changing that (as Japanese banks have been forced to do, raising non-interest income from 18% in 2000 to over 43% in 2017[27]) will require applying traditional disciplines like pricing, segmentation and value articulation much more rigorously to non-lending services. This is especially the case for new/adjacent services that integrate with the bank's core traditional offer.

Of course, the good news is that in this environment every customer will be facing their own challenges, preparing to survive, compete and thrive in a world of negative rates. Given banks' natural advantages in balance sheet and cash flow management, it's an opportunity for them to bring creative solutions to their customers which could be extremely valuable.

Partnerships and capability – including regulatory

Finally, the new environment will bring challenges few banks are equipped to address alone. In many cases, third parties will disintermediate banks from customers, but still offer banks an opportunity to partner and share value in the provision of non-lending services. This is in many ways the opposite of the traditional bank partnership, where the bank manages the provision of balance sheet and a partner offers other services. In other cases, especially in the resolution of industry-wide technical standards or other practices, it may be necessary for banks, customers and regulators to work together in ways they haven't done perhaps since the GFC.

Managing all this change illustrated in the schematic of **Exhibit 18** will be both a challenge and an opportunity.

(26) The reality of a new era for Australian Banking, PwC Major Banks analysis, FY19, November 2019.

(27) FRED, Federal Reserve Bank of St. Louis Economic Research.

Exhibit 18: Ensuring readiness: Signal, stock and flow framework across extended balance sheet

Ensuring readiness

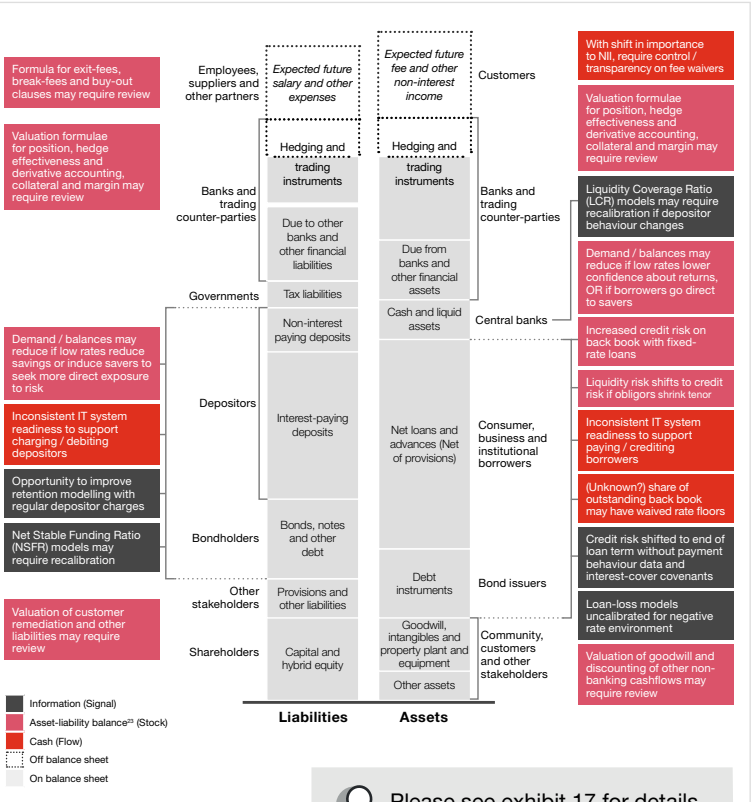
Systematic review of consequences across balance sheet, P&L and for every stakeholder

Implications across both sides of balance sheet on:

Signal (information flow, models and incentives)

Stock (valuations, asset-liability balances)

Flow (payments and cashflows)



Please see exhibit 17 for details

Fit to compete

Cost structure

- Ensure plan to align costs to world with NIMs down another 50-75 bps
- More serious use of automation, industry consolidation (utilities and outsourcing)

Credit portfolio

- Revisit reliance on behavioural modelling in case interest payments diminish and alternative sources of credit information emerge
- Stress credit exposures under 'inflection point' and 'distortion' scenarios

Balance sheet

- Greater discipline in prioritising fee and service-oriented counterparties
- Prepare for possible shift from asset-led to liability-led bank strategy
- Stress assets and liabilities under both scenarios

Postioned to thrive

Fees and services

- Prepare for increased focus, scrutiny and reliance on fee income and services
- Invest in sources of differentiation and price preservation

Partnerships and capability

- Where spreads narrow beyond capability to profitably serve, seek investor partners to provide balance sheet alongside bank services to clients

A brave new world with imperatives strangely the same

The recommendations above – to scrutinise cost, fee income, credit, balance sheet and capabilities – make sense under almost any scenario. They rely merely on the fact that rates and margins are heading lower, as are the returns banks earn from maturity, credit and liquidity transformation.

It doesn't matter why, or how far they go.

Banks need to respond, and we believe that those banks preparing in the ways described above won't regret doing so.

Of course, at the highest level, these priorities are no different from what banks are already doing today.

However, low or zero rates raise the stakes and compress the time available. Accordingly, they also increase the urgency.

As inflation expectations, return expectations, and interest rates continue to head lower, more and more markets are confronting the reality that there is nothing impossible about negative rates. They will have profound – and in many cases destabilising – effects on banks and other institutions who are not prepared. As with all things, those who are best prepared will find the next era as full of opportunity as the ones gone by.

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