Document 2

Appendix 1 – Background Analysis

Housing market developments

House prices have dropped since the start of the year, decreasing by 10.2 percent nationwide since the November 2021 peak, with seven consecutive months of negative house price growth. Rising interest rates, tax policy changes, tighter LVR requirements and changes to the Credit Contracts and Consumer Finance Act (CCCFA) have suppressed demand, while construction materials and labour shortages have constrained supply in the short term. The largest price declines have been in urban centres, notably Auckland and Wellington.

Figure 1: REINZ monthly house price inflation and house sales

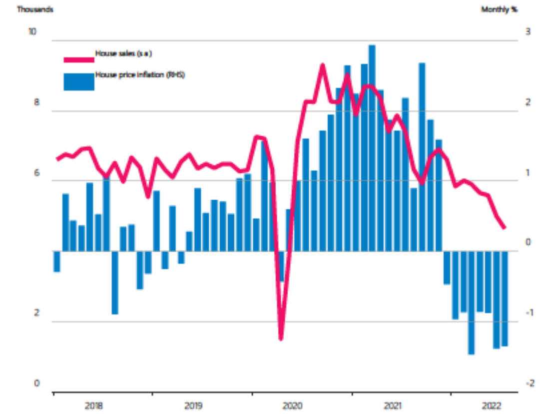


Figure 2: House prices by region (relative to peak)

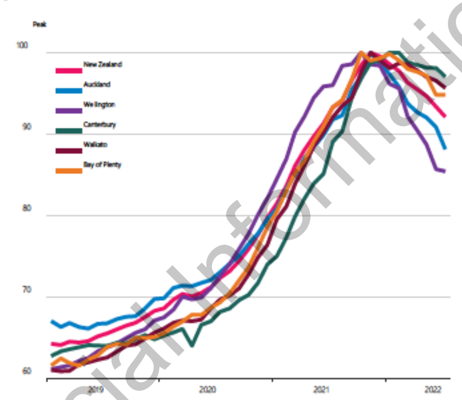


Figure 3: Value of monthly mortgage lending flows by buyer type (s.a.)

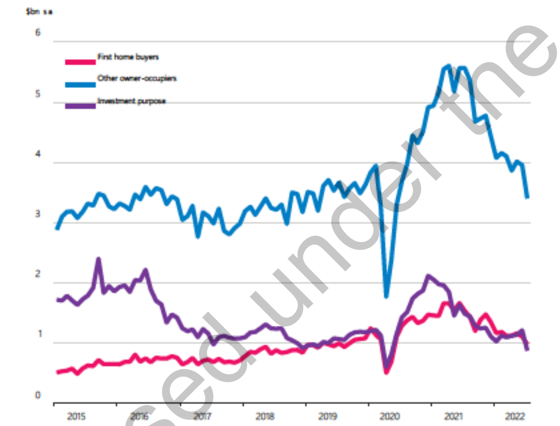
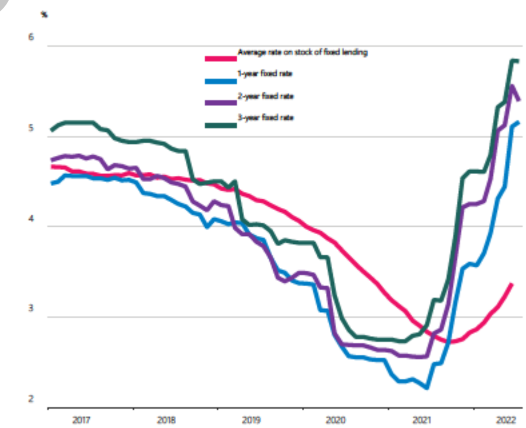


Figure 4: New fixed mortgage rates and average rate on existing fixed rate lending

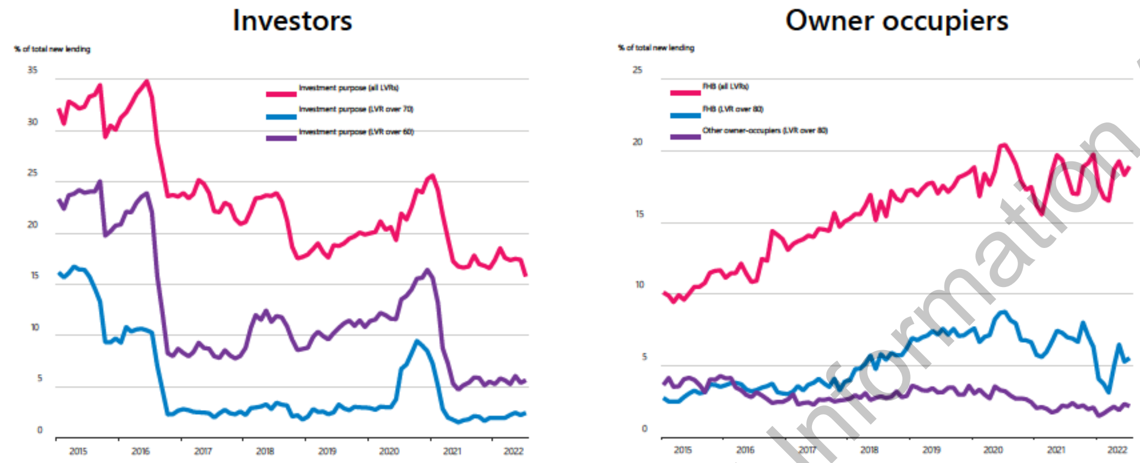


Mortgage lending flows have slowed in line with the decline in sales volumes, refinancing activity and top-ups. Several developments have weakened demand for mortgage lending. The most significant development is the increase in mortgage rates. From January to June, 1-3 year fixed mortgage rates increased by 120-150 bps. Mortgage rates are now at levels last seen in 2017 in nominal terms, although they are still lower in inflation-adjusted terms. More recently, some banks have announced cuts in mortgage rates as swap rates have fallen.

Tight LVR requirements have also contributed to weakening mortgage demand, especially for investors (figure 5a). Government changes to the bright-line test and interest deductibility have also contributed to reduce investor demand, as after-tax yields are lower for highly leveraged investors in particular. However, an exemption for new builds limits the impact of this change.

Mortgage lending was also weakened by changes to the CCCFA that came into force last December which required lenders to perform more extensive checks of borrowers' income and expenses when calculating their net income surplus. An amendment to the CCCFA aimed at addressing the conservative implementation by banks and adjusting definitions came into force on July 7.

Figure 5a and 5b: Share of new mortgage lending by buyer type and LVR



Assessment of risks

Our macro-prudential policy decision framework outlines four key main considerations for reviewing policy settings. This includes:

1. the probability of a correction in house prices;

2. the resilience of households;

3. the resilience of the financial system; and

4. the risk of spill-overs to the wider economy.

This four-step assessment is used to consider the housing-related risks to financial stability and is the basis of the options analysis with regard to the appropriate policy response.

1. Probability of a correction in house prices

House price declines in recent months mean that our models show current prices are closer to the sustainable level than they were at the start of the year (table 1). This suggests that the probability of a correction has diminished. However, house prices remain elevated relative to what we think is sustainable.[4]

[4] See #9865028 for our Committee paper on our model suite.

Table 1: Estimates of house price sustainability[5]

House Price over/under valuation	Valuation as at January 2022	Valuation as at June 2022
Investor asset pricing model (no leverage)	+10.5%	+7.2% (overvalued)
Owner-occupier valuation (user cost model)	+16.8%	+10.3%
Mortgage to Rent Ratio	+13.9%	+10.4%
Pre-tax rental yields on residential property	+29.8%	+25.8%
Average debt servicing for 2-year mortgage	+29.0%	+20.1%

2. Resilience of households

We consider the resilience of households from two perspectives: 1) the riskiness of the flow of new lending, which is what LVR restrictions have the most direct effect on, and 2) the riskiness of the overall stock of mortgage lending. The riskiness of the overall stock of mortgage lending matters for the broader resilience of the financial system and the economy.

2.1 Resilience of the flow of new lending

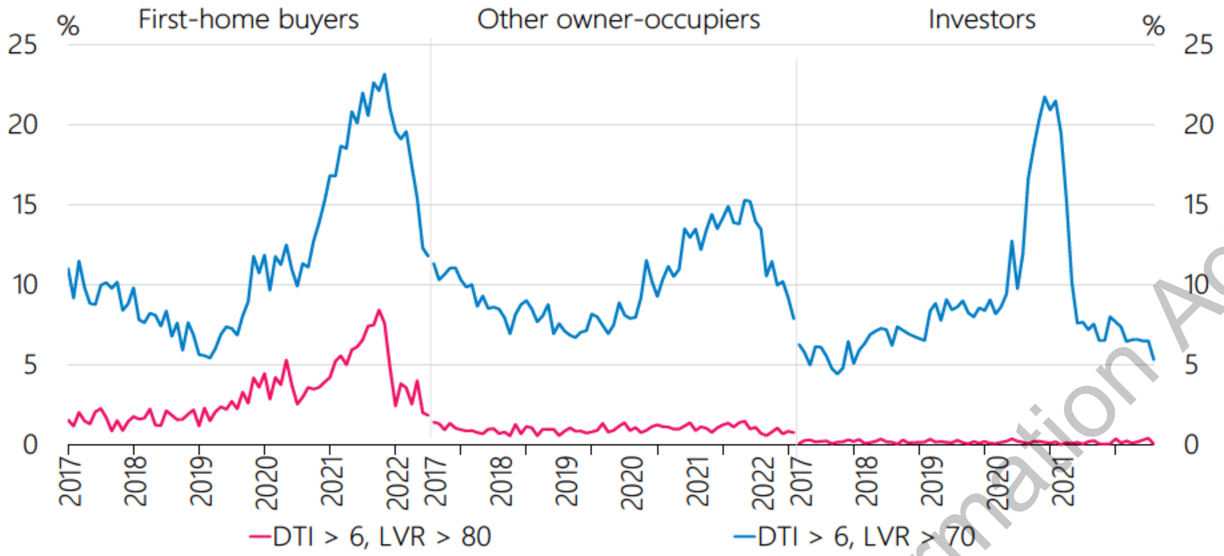
Tighter LVR limits since early 2021, along with CCCFA changes and higher test interest rates[6] for assessing affordability, saw the flow of higher risk lending decline in the past 12 months.

For investors, market contacts have reported that restrictions on tax deductibility of interest payments have meant that investors are also finding it harder to pass banks' debt servicing assessments, and as a result some property investors are borrowing from non-banks. While still small, we continue to monitor this development.

Banks have tended to allocate their high-LVR owner-occupier lending allowance primarily to first home buyers, although this lending has also declined from its recent peak (figure 6). While the new flow of high risk borrowers has fallen sharply, many households borrowed at high LVRs before LVR restrictions were re-introduced in late 2021.

[5] Note that we have added a model comparing rental yields to long-term bond yields which has increased the top of the range compared to previous estimates.
[6] Test rates are the rates banks use to assess an applicant's ability to service debts should interest rates rise.

Figure 6: Higher risk (both high-LVR and high-DTI) shares of new lending by buyer type



2.2 Resilience of the stock of overall mortgage lending

Overall, the household sector saw a substantial increase in aggregate net wealth during the past three years as a result of strong economic activity and rising house prices (figures A3 and A4). More recently, the value of housing wealth has eroded as house prices have fallen, however, households' balance sheets remain strong in aggregate as a result of previous gains.

Despite households' strong aggregate position to absorb housing and interest rate shocks, some vulnerabilities remain. Vulnerabilities remain concentrated among households that have borrowed recently at high LVRs and DTIs. Earlier cohorts of borrowers have begun to repay some of their debt and also experienced large gains in their equity positions as prices continued to rise through 2021.

Resilience of households to a decline in house prices

We can simulate the impact of further correction in house prices. A decline of around 30 percent in house prices would take prices back to levels in early 2020.

A 30 percent decline in house prices from current levels would now result in around 20 percent of the total stock of lending falling into negative equity (figure A7). This is an increase from around 10 percent falling into negative equity from an equivalent shock six months ago. This is because some earlier borrowers have had some of their housing equity buffer eroded by the fall in house prices that has occurred. However, the tightening of LVR restrictions means recent borrowers will be better able to absorb a house price correction than some earlier borrowers with lower deposits.

The risk of negative equity is largely concentrated among owner-occupier lending (figure A8). A 30 percent fall in prices from current levels would see less than 1 percent of investment lending fall into negative equity, owing to the much tighter LVR requirements in place on investors.

Resilience of households to mortgage rate increases

A significant share of fixed mortgage debt is expected to reprice at higher mortgage rates in coming months, increasing the effective mortgage rate and raising debt servicing costs for households (figure A5). During 2022, around 50 percent of the stock of fixed mortgage debt will reprice.

Based on monetary policy expectations priced into the swaps market, mortgage interest rates are projected to be close to their peak. In recent weeks, several banks have cut their mortgage rates. Bank test rates for debt servicing assessments have also increased in recent months as wholesale interest rates have risen, and most are now around 7.5% or above. As a result of these assessments, we expect that recent borrowers will be able to absorb further rate increases if they occur. We expect that most households who borrowed during 2020-2021 when mortgage rates were at low levels will still be able to service debt at current rates, as test rates during that period were around where mortgage rates are currently (figure A6), however further interest rate increases beyond what is currently expected would start to exceed these buffers.

While test rates suggest that most borrowers will be able to absorb current or slightly higher interest rate levels, some borrowers would need to cut back on other discretionary consumption in order to make their loan repayments (figure A9).

First home buyers are most exposed to the impact of higher serviceability costs as they tend to have lower income levels and smaller buffers to absorb higher costs. Around 50 percent of lending to first home buyers would require some reduction in discretionary spending to continue servicing mortgage payments if interest rates rose above 7 percent. A reduction in discretionary income would have flow-on impacts for broader economic activity.

3. Resilience of the financial system

The level of bank capital held relative to the level of mortgage lending has increased significantly in recent years as a result of the increase in the amount of capital we require banks to hold. This has put banks in a better position to absorb potential losses on their mortgage portfolio (figure A10). As a result, we expect that the financial system will be able to cope with impact of the recent house price reductions and further corrections.

In addition, the 2021 bank solvency stress test assessed the resilience of the five largest banks to a severe economic downturn involving a 39 percent fall in house prices and a rise in the unemployment rate to 11.8 percent. The stress test exercise showed that the banking system would on the whole be able to cope with the impact of plausible levels of mortgage borrower stress. The 2022 stress test scenario currently being undertaken will feature a substantial rise in mortgage rates, combined with a recession and high unemployment

4. Spillovers to the wider economy

As noted above, many borrowers will re-price their mortgages in coming months on to higher interest rates. This upward repricing will necessitate some reduction in discretionary consumption in response to serviceability pressures, particularly among recent first home buyers. Recent high inflation may also reduce households' discretionary spending if wage increases continue to not keep up with inflation. However, we expect that most households will continue to be able to service their mortgage payments as long as the labour market remains tight with unemployment at historic lows, reducing the likelihood of negative income shocks due to job loss.

We remain mindful of potential negative wealth effects from falling house prices and also the effects such a decline could have on residential construction activity. Market contacts have reported that the pipeline for residential construction has slowed sharply recently as rising interest rates, falling house prices and supply chain uncertainty have led to a large decline in pre-sales. In addition, historically high debt levels could make consumers particularly sensitive to a rising interest rate environment. Offsetting these factors, negative wealth effects could be muted by the wealth accumulated by households during the previous period when house prices were rising. The tighter LVR restrictions introduced last year also mean that recent borrowers are better able to absorb a further correction in house prices.

The net effects of these factors on economic activity are difficult to measure. On balance, we assess the risk of spill-over effects to the economy as currently moderate but rising slightly compared to six months ago.

Table 2: Summary of Risk Assessment

	6m ago	Developments over past 6 months	Now*	Assessment
House price sustainability	(red)	• Housing demand weakened • Housing supply remains constrained	(red)	• House prices are still above sustainable levels but gap has narrowed IMPROVED
Resilience of households	(amber)	• High LVR lending declined relative to before LVR rules tightened • Balance sheet remains strong despite lower housing wealth	(amber/green)	• High risk (high LVR and high DTI) lending has declined in recent months. • Some households stretched by rising mortgage rates and higher cost of living IMPROVED
Resilience of financial system	(green)	• Bank capital ratios remain above current requirements	(green)	• Banks' capital buffers for mortgage lending have increased. NO CHANGE
Spillovers to wider economy	(amber)	• Mortgage repricing will increase debt servicing costs • Labour market conditions remain strong	(amber)	• Most borrowers can absorb higher interest rates if labour market remains strong • Negative housing wealth effects uncertain NO CHANGE

Key

(red)	Significant risk of house price correction. Low resilience in the household or banking sector to a housing shock. High spillovers to the wider economy from a housing shock.
(amber)	Moderate risk of house price correction. Moderate resilience in household or banking sector to a housing shock. Moderate spillovers to the wider economy from a housing shock.
(green)	Low risk of house price correction. High resilience in household or banking sector to a housing shock. Low spillovers to the wider economy from a housing shock.
(green/amber)	An assessment is near the threshold between two risk categories.

Appendix 2 - Data

Figure A1: Principal and interest payments as percent of median household disposable income, for a buyer of the median house price at 80% LVR

Figure A2: User cost model (owner occupiers) valuation

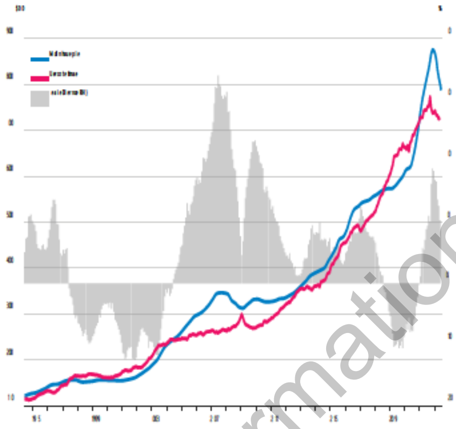


Figure A3: Household net savings rate and accumulated savings

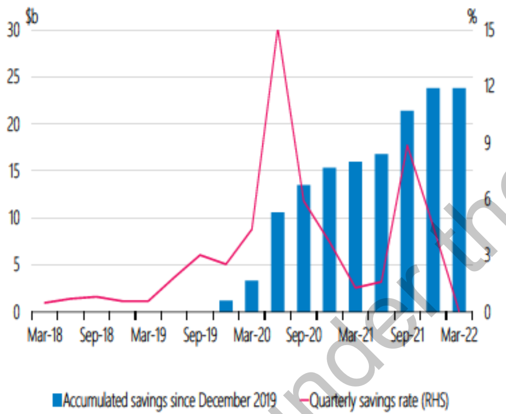


Figure A4: Household net wealth as % of household disposable income

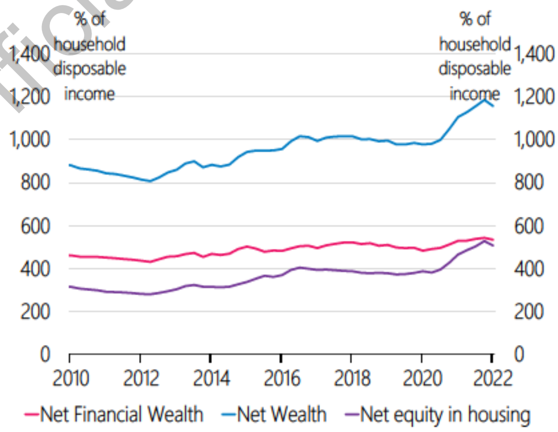


Figure A5: Stock of mortgages subject to repricing

Figure A6: Projected Mortgage Rates

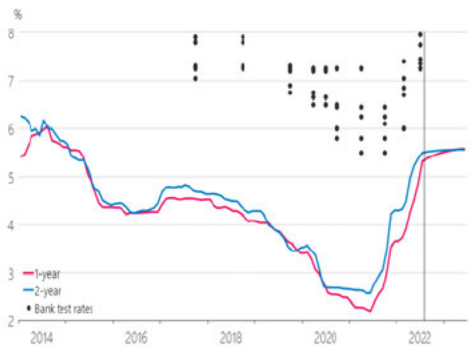


Figure A7: Estimated share of stock of lending in negative equity following house price falls

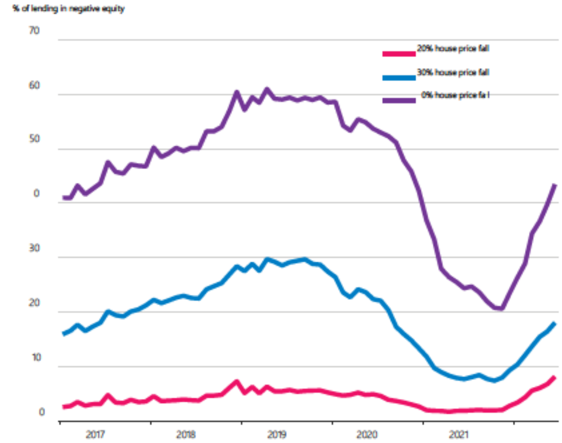


Figure A8: Estimated share of stock of lending in negative equity following house price falls by borrower type

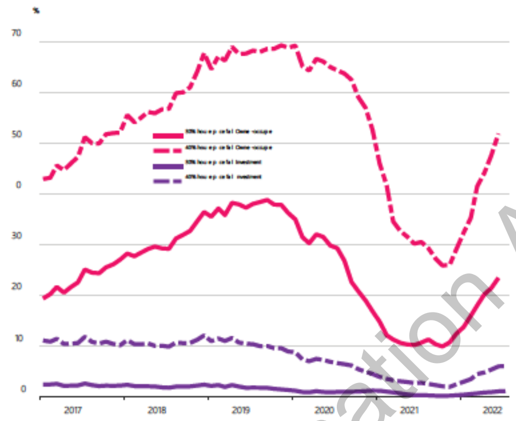


Figure A9: Estimated share of lending in the year to December 2021 that would face serviceability stress under different interest rates, by buyer type

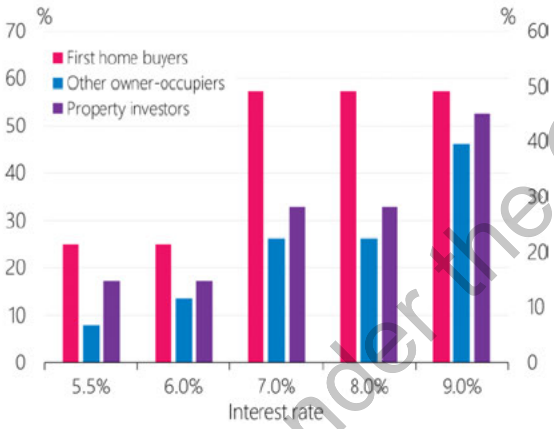


Figure A10: Bank capital per $100 of mortgage lending (major banks)

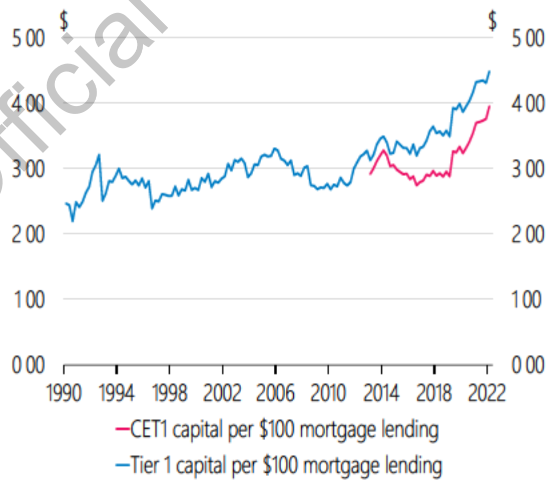
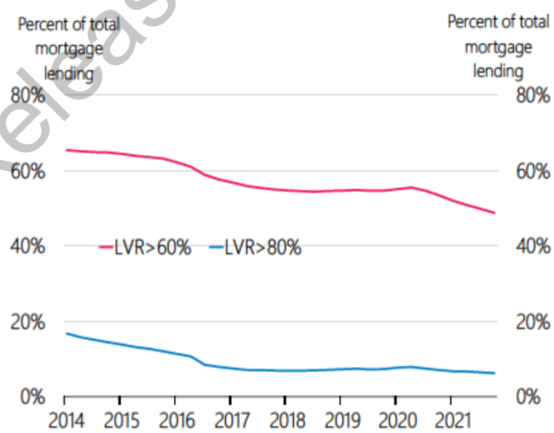


Figure A11: Stock of high LVR lending



Checklist for Author(s)

[Please complete and and submit it with your ELT approved paper and appendices. Board Secretariat will save and remove the form after the Governor and *Chair's review and before uploading the document into the Board pack/Diligent.

*The Chair will on occasion review/approve papers, and this generally relates to papers that the Governor would like the Chair's review/approval before the full Board's consideration or for non-Executive Board papers that are sponsored by the Board/Chair].

Details	**Author(s):** **ELT Approver:** **Board Paper Title:**	
1.	Plan sufficient time to meet the paper deadline (note this is a hard deadline) • Diarise sufficient time to draft the paper, have it peer reviewed, and legally reviewed by Legal (if required) • Diarise sufficient time for your ELT Approver to review & approve the paper.	☒ Completed
2.	Review the Delegations Framework (E.g. who makes decisions on the recommendations? E.g. If issuing an external document/letter to the Minister, who on ELT/Board will be authorised to sign the doc?) If unsure about the Delegations Framework, consult Legal.	☒ Reviewed and the Recommendations in the Board paper reflect this
3.	Director Interests and Conflict: Consult with your ELT Approver on Board Director(s) who have interests that conflict with parts or the whole paper (part = redacted those parts/whole =exclude the paper from that Director's Board pack). If unsure about the conflicts, consult the Board Secretary.	☐ Checked and confirmed no conflicts ☐ Checked, consulted and confirmed the following conflicts: **Board Director: [List]** What interest and conflict? Details: ☐ Whole – exclude the whole paper and attachments from the conflicted Director's Diligent pack ☐ Part document – separate redacted document(s) provided, and issue this paper and attachments in the conflicted Director's Diligent pack
4.	Advise the Board Secretary of the Director(s) conflicts	☐ Completed with notes in 3.
5.	Publication on the Vault after the Board meeting	☐ OK to publish the whole paper ☐ OK to publish part of the paper (sections to be redacted clearly marked as **[Commercially sensitive] OR [privacy related people information]** [The Board Secretary will redact the information when the report is published

Details	Author(s): ELT Approver: Board Paper Title:	
		on the Vault after the Board meeting. This is also relevant for decisions on OIA/privacy requests]
6.	Draft the Board paper as per the template format and style. Keep the paper brief and succinct (3-4 pages). Ensure: • Recommendations are drafted as note/review/approve or a combination of those actions • Risks, and funding & budget sections are completed	☒ Confirmed
7.	The paper has been reviewed and approved by the ELT Approver.	☒ Completed
8.	Finalise paper and appendices, and send them with this completed checklist to the Board Secretary by the deadline. *Reminder*: Ensure the attachments are referred in the paper as Appendix 1, 2, 3 etc. and marked as such on the top left.	☐ Completed

SENSITIVE

Memo for Financial Stability Committee

From	Enzo Cassino, Ashley Farquharson (Financial System Analysis) and Graeme Cokayne (Financial Policy)
Date	12 August 2022
Subject	Housing and macro-prudential policy update
For your	Decision

DTSG is asked to:

- **Note that** the housing market continues to soften, with lower house sales, rising inventories and declining prices in recent months.
- Note that medium-term fundamentals continue to point to current house prices being above sustainable levels, although the degree of overvaluation has declined compared to six months ago.
- Note that high LVR lending has declined since restrictions were reintroduced last year, increasing the resilience of households to a house price correction.
- Note that the financial system should be resilient to a house price correction.

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Purpose

This paper outlines our analysis of the housing market and mortgage lending, which forms the basis of our decisions on LVR restrictions. The first part of the paper summarises developments in the housing market and mortgage lending during the past six months. The second part of the paper assess the impact of these developments on risks related to housing market and lending conditions and considers the implications for macro-prudential policy settings.

Housing market developments

House prices have dropped since the start of the year, decreasing by 10.2 percent nationwide since the November 2021 peak, with seven consecutive months of negative house price growth. Rising interest rates, tax policy changes, tighter LVR requirements and CCCFA changes have suppressed demand while construction materials and labour shortages have constrained supply in the short term. The largest declines have been in urban centres, notably Auckland and Wellington.

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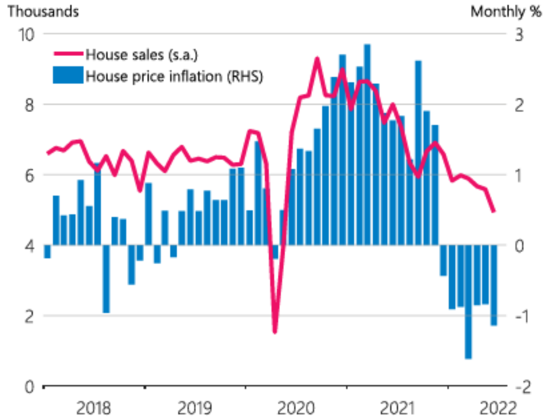

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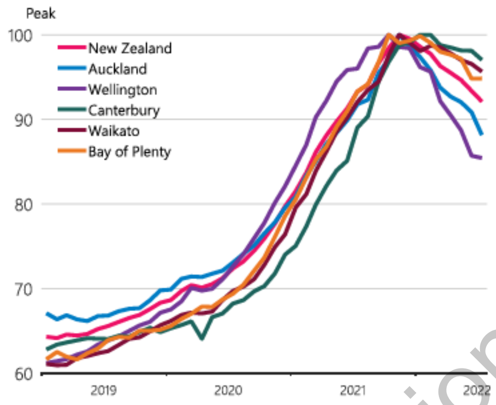

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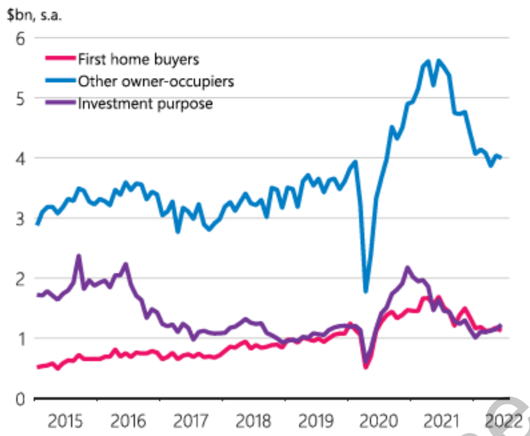

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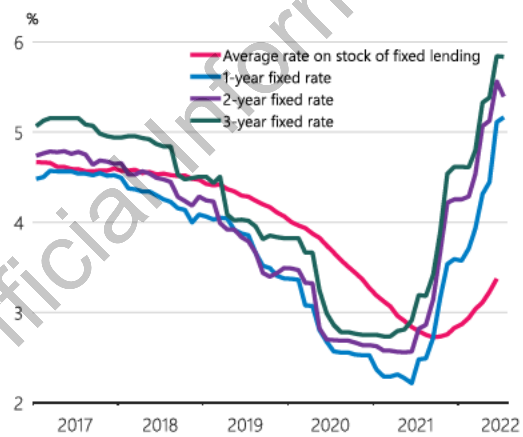
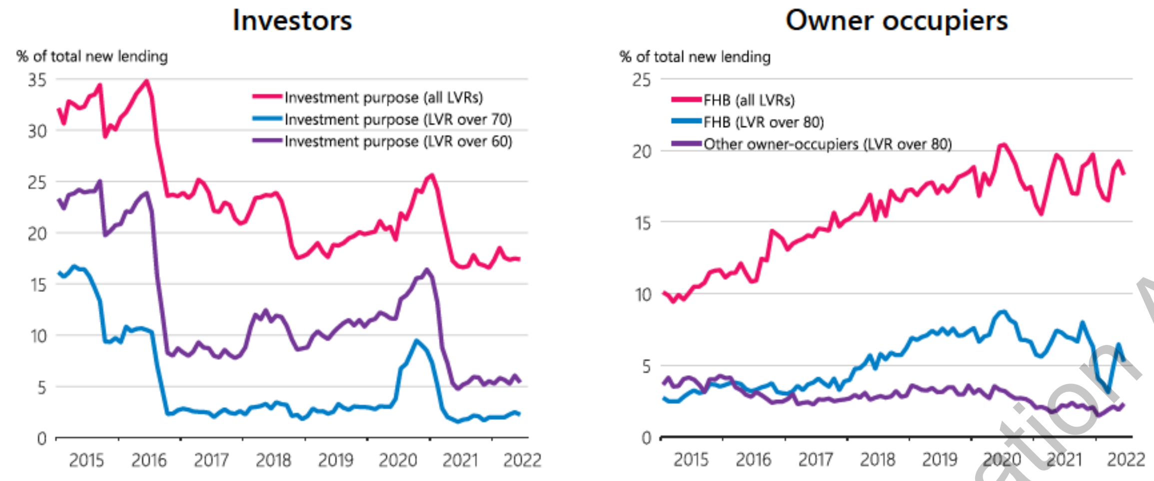


Mortgage lending flows have slowed in line with the decline in sales volumes, refinancing activity and top-ups. Several developments have weakened demand for mortgage lending. The most significant development is the increase in mortgage rates. From January to June, 1-3 year fixed mortgage rates increased by 120-150 bps. Mortgage rates are now at levels last seen in 2017 in nominal terms, although they are still lower in real terms. More recently, some banks have announced cuts in mortgage rates as swap rates have fallen.

Tight LVR requirements have also contributed to weakening mortgage demand, especially for investors (figure 5a). Alongside tighter LVRs, government changes to the bright-line test and interest deductibility have also contributed to reduce investor demand, as after tax yields are lower for highly leveraged investors in particular. However, an exemption for new builds limits the impact of this change.

Figure 5a and 5b: Share of new mortgage lending by buyer type and LVR



Mortgage lending was also weakened by changes to the CCCFA that came into force last December which required lenders to perform more extensive checks of borrowers' income and expenses when calculating their net income surplus. An amendment to the CCCFA aimed at addressing the conservative implementation by banks and adjusting definitions came into force on July 7.

Assessment of risks

Our updated macro-prudential policy decision framework outlines four key main considerations for reviewing policy settings:[1]

1. Assess the probability of a correction in house prices

2. Assess the resilience of households,

3. Assess the resilience of the financial system,

4. Assess the risk of spill-overs to the wider economy.

In this section, we provide an update of how we are seeing these factors. Table 1 provides a summary of the assessment.

1. Probability of a correction in house prices

House prices remain elevated relative to what we think is sustainable.[2] However, house price declines in recent months mean that our models show current prices are closer to the sustainable level than they were at the start of the year (table 1). This suggests that the probability of a correction has diminished.

[1] Memo to FSC "Housing and macroprudential policy update – Background paper", Graeme Cokayne, 2 August.

[2] See #9865028 for our Committee paper on our model suite.

Table 1: Estimates of house price sustainability

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Pre-tax rental yields on residential property	+29.8%	+25.8%
Average debt servicing for 2-year mortgage	+29.0%	+20.1%

2. Resilience of households

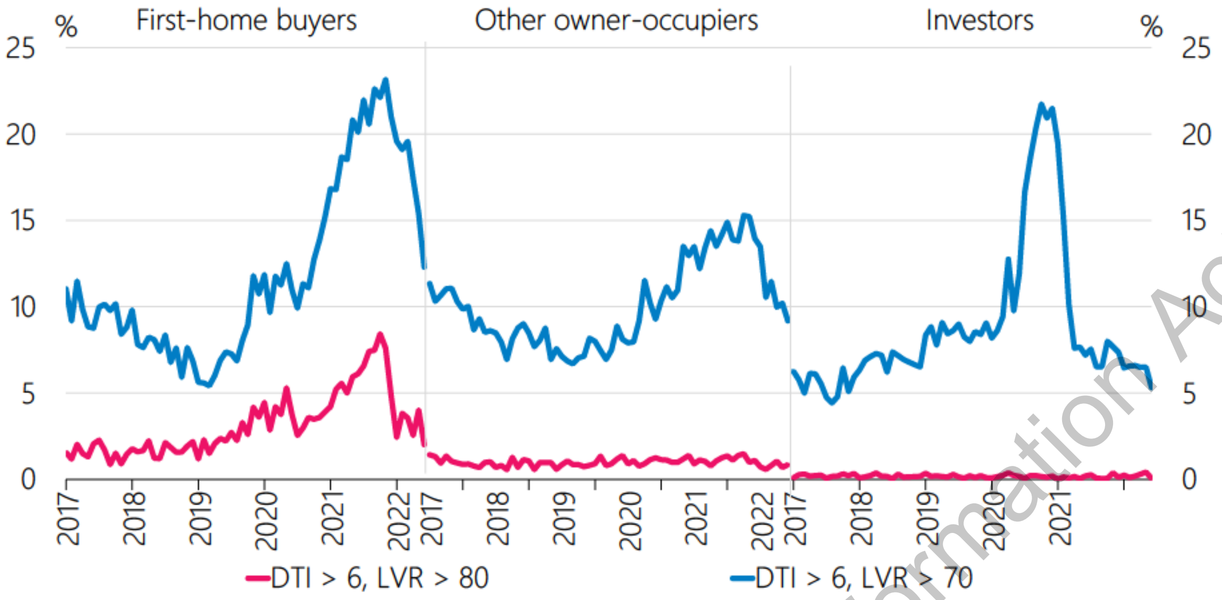
Overall, the household sector saw a substantial increase in aggregate net wealth during the past 3 years as a result of strong economic activity and rising house prices (figures A3 and A4). More recently, the value of housing wealth has eroded as house prices have fallen, however, households' balance sheets remain strong in aggregate as a result of previous gains.

Despite households' strong aggregate position to absorb housing and interest rate shocks, some vulnerabilities remain. Vulnerabilities remain concentrated among households that have borrowed recently at high LVRs and DTIs. Earlier cohorts of borrowers have begun to repay some of their debt and also experienced large gains in their equity positions as prices continued to rise through 2021.

Tighter LVR limits since early 2021 saw the flow of higher risk lending to investors decline sharply. In addition to the LVR restrictions, market contacts have reported that restrictions on tax deductibility of interest payments have meant that investors are finding it harder to pass banks' debt servicing assessments, and as a result many property investors are borrowing from non-banks. Banks have tended to allocate their high-LVR owner-occupier lending allowance primarily to first home buyers, although this lending has also declined from its recent peak (figure 6).

[3] Investor asset pricing model (with interest deduction tax policy change) +47.1% (overvalued) with 70% leverage

Figure 6: Higher risk (both high-LVR and high-DTI) shares of new lending by buyer type



2.1 Resilience of households to a decline in house prices

We can simulate the impact of further correction in house prices towards sustainable levels and back to pre-COVID levels. A decline of around 30 percent in house prices would take prices back to levels in early 2020.

A 30 percent decline in house prices from current levels would now result in around 20 percent of the total stock of lending falling into negative equity (figure A7). This is an increase from around less than 10 percent falling into negative equity from an equivalent shock six months ago. This is because some earlier borrowers have had some of their housing equity buffer eroded by the fall in house prices that have occurred. However, the tightening of LVR restrictions means recent borrowers should be better able to absorb a house price correction than some earlier borrowers with lower deposits.

The risk of negative equity is largely concentrated among owner-occupier lending (figure A8). A 30 percent fall in prices from current levels would see less than 1 percent of investment lending fall into negative equity, owing to the much tighter LVR requirements in place on investors.

2.2 Resilience of households to mortgage rate increases

A significant share of fixed mortgage debt is expected to reprice at higher mortgage rates in coming months, increasing the effective mortgage rate and raising debt servicing costs for households (figure A5). During 2022 overall, around 50% of the stock of fixed mortgage debt will reprice.

Based on monetary policy expectations priced into the swaps market, mortgage interest rates are projected to be close to their peak. In recent weeks, several banks have cut their mortgage rates. Bank test rates for debt servicing assessments have also increased in recent months as wholesale interest rates have risen, and most are now around 7.5% or above. This provides a degree of confidence that recent borrowers should be able to absorb further rate increases if they occur. Households who borrowed during 2020-2021 when mortgage rates were at low levels should still be able to service debt at current rates, as test rates during that period were around where mortgage rates are currently (figure A6), however further interest rate increases beyond what is currently expected would start to exceed these buffers.

While test rates suggest that most borrowers should be able to absorb current or slightly higher interest rate levels, some borrowers would need to cut back on other discretionary consumption in order to make their loan repayments (figure A9). First home buyers are most exposed to the impact of higher serviceability costs as they tend to have lower income levels and smaller buffers to absorb higher costs. Around 50 percent of lending to first home buyers would require some reduction in discretionary spending to continue servicing mortgage payments if interest rates rose above 7 percent. A reduction in discretionary income would have flow-on impacts for broader economic activity.

3. Resilience of the financial system

The financial system should be able to cope with impact of the recent house price reductions and further corrections. The level of bank capital held relative to the level of mortgage lending has increased significantly in recent years putting banks in a better position to absorb potential losses on their mortgage portfolio (figure A10).

In addition, the 2021 bank solvency stress test assessed the resilience of the five largest banks to a severe economic downturn involving a 39 percent fall in house prices and a rise in the unemployment rate to 11.8 percent. The stress test exercise showed that the banking system would on the whole be able to cope with the impact of plausible levels of mortgage borrower stress. The 2022 stress test scenario will feature a substantial rise in mortgage rates, combined with a recession and high unemployment

4. Spillovers to the wider economy

As noted above, many borrowers will re-price their mortgages in coming months on to higher interest rates. This upward repricing will necessitate some reduction in discretionary consumption in response to serviceability pressures, particularly among recent first home buyers. Recent high inflation may also reduce households' discretionary spending if wage increases continue to not keep up with inflation. However, households should continue to be able to service their mortgage payments as long as the labour market remains tight with unemployment at historic lows, reducing the likelihood of negative income shocks due to job loss.

We remain mindful of potential negative wealth effects from falling house prices and also the effects such a decline could have on residential construction activity. Market contacts have reported that the pipeline for residential construction has slowed sharply recently as rising interest rates, falling house prices and supply chain uncertainty have led to a large decline in pre-sales. In addition, historically high debt levels could make consumers particularly sensitive to a rising interest rate environment. Offsetting these factors, negative wealth effects could be muted by the wealth accumulated by households during the previous period when house prices were rising. The tighter LVR restrictions introduced last year should also mean that recent borrowers are better able to absorb a further correction in house prices.

The net effects of these factors on economic activity are difficult to measure. On balance, we assess the risk of spill-over effects to the economy as currently moderate but rising slightly compared to six months ago.

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- [redacted]
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- [redacted]
- [redacted]

[redacted].

Table 2: Summary of Risk Assessment

	6m ago	Developments over past 6 months	Now*	Assessment
House price sustainability		• Housing demand weakened • Housing supply remains constrained		• House prices are still above sustainable levels but gap has narrowed IMPROVED
Resilience of households		• High LVR lending declined relative to before LVR rules tightened • Balance sheet remains strong despite lower housing wealth		• High risk (high LVR and high DTI) lending has declined in recent months. • Some households stretched by rising mortgage rates and higher cost of living IMPROVED
Resilience of financial system		• Bank capital ratios remain above current requirements		• Banks' capital buffers for mortgage lending have increased. NO CHANGE
Spillovers to wider economy		• Mortgage repricing will increase debt servicing costs • Labour market conditions remain strong		• Most borrowers can absorb higher interest rates if labour market remains strong • Negative housing wealth effects uncertain NO CHANGE

Key

	Significant risk of house price correction. Low resilience in the household or banking sector to a housing shock. High spillovers to the wider economy from a housing shock.
	Moderate risk of house price correction. Moderate resilience in household or banking sector to a housing shock. Moderate spillovers to the wider economy from a housing shock.
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	An assessment is near the threshold between two risk categories.

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Figure A2: User cost model (owner occupiers) valuation

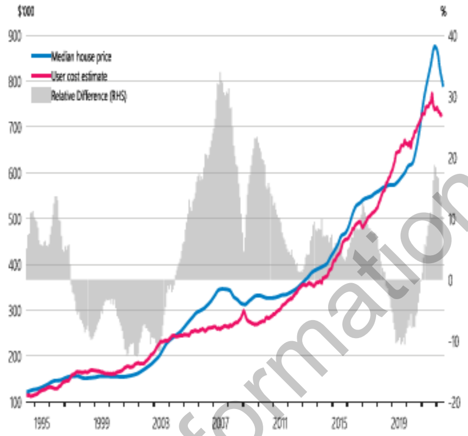

Figure A3: Household net savings rate and accumulated savings

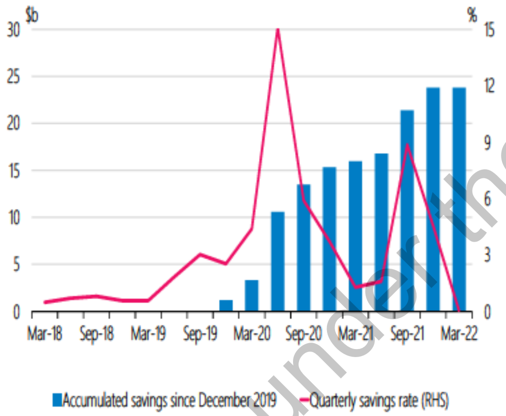

Figure A4: Household net wealth as % of household disposable income

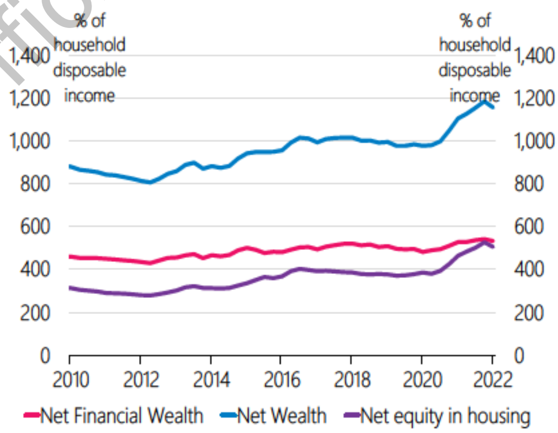

Figure A5: Stock of mortgages subject to repricing

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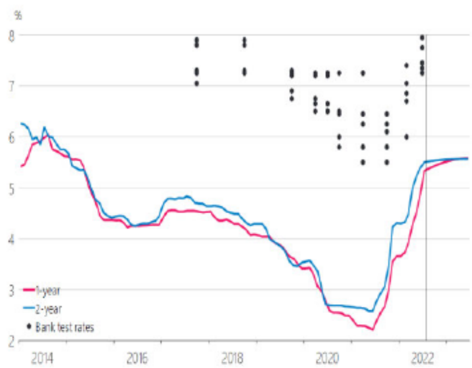


Figure A7: Estimated share of stock of lending in negative equity following house price falls

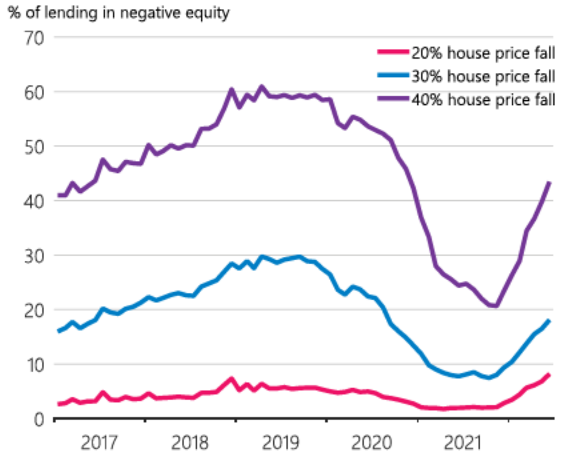


Figure A8: Estimated share of stock of lending in negative equity following house price falls by borrower type

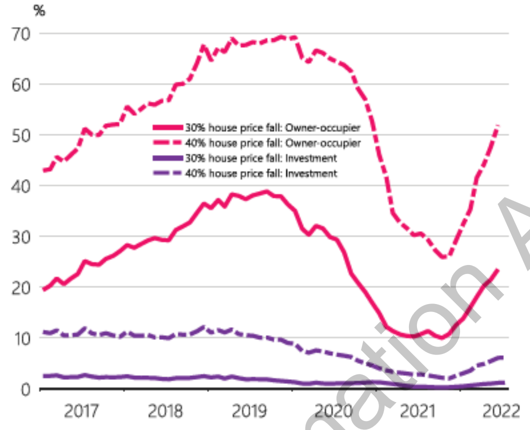


Figure A9: Estimated share of lending in the year to December 2021 that would face serviceability stress under different interest rates, by buyer type

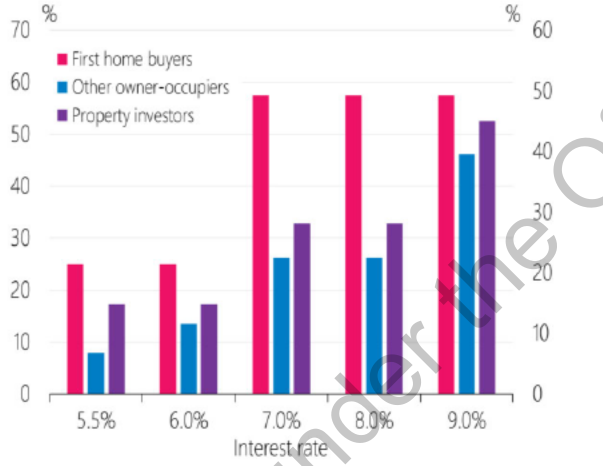
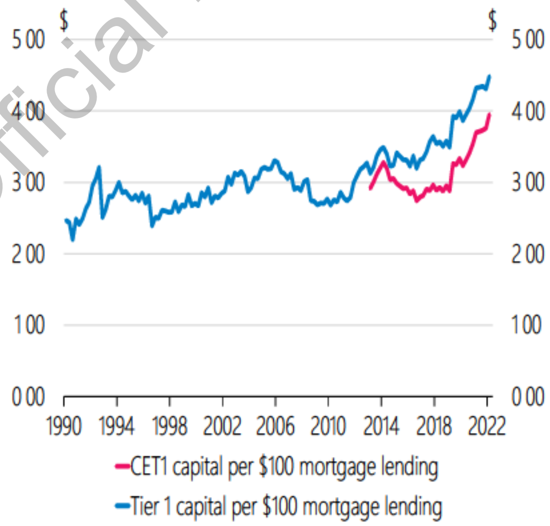


Figure A10: Bank capital per $100 of mortgage lending (major banks)



Document 4

SENSITIVE

Reserve Bank of New Zealand
Te Pūtea Matua

Memo for Financial Stability Committee

From	Enzo Cassino, Ashley Farquharson (Financial System Analysis) and Graeme Cokayne (Financial Policy)
Date	18 August 2022
Subject	Housing and macro-prudential policy update
For your	Decision

FSC is asked to:

- **Note** that the housing market continues to soften, with lower house sales, rising inventories and declining prices in recent months.
- **Note** that medium-term fundamentals continue to point to current house prices being above sustainable levels, although the degree of overvaluation has declined compared to six months ago.
- **Note** that high LVR lending has declined since restrictions were reintroduced last year, increasing the resilience of households to a house price correction. Higher mortgage rate and CCCFA changes have also reduced higher risk lending.
- **Note** that we have not yet seen the full impact of rising mortgage rates on households and Banks.
- **Note** that the financial system should be resilient to a house price correction.

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Purpose

This paper outlines our analysis of the housing market and mortgage lending, which forms the basis of our decisions on LVR restrictions. The first part of the paper summarises developments in the housing market and mortgage lending during the past six months. The second part of the paper assess the impact of these developments on risks related to the housing market and lending conditions and considers the implications for macro-prudential policy settings.

Housing market developments

House prices have dropped since the start of the year, decreasing by 10.2 percent nationwide since the November 2021 peak, with seven consecutive months of negative house price growth. Rising interest rates, tax policy changes, tighter LVR requirements and CCCFA changes have suppressed demand while construction materials and labour shortages have constrained supply in the short term. The largest declines have been in urban centres, notably Auckland and Wellington.

Figure 1: REINZ monthly house price inflation and house sales

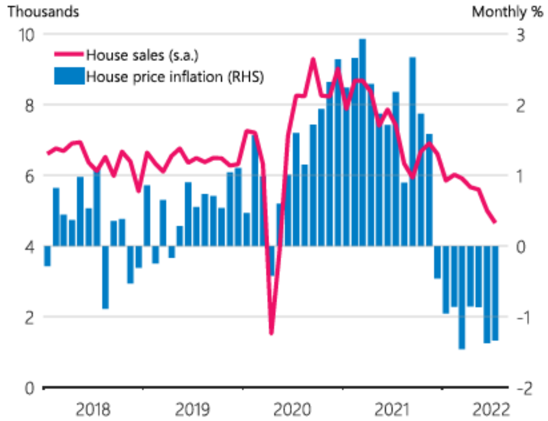


Figure 2: House prices by region (relative to peak)

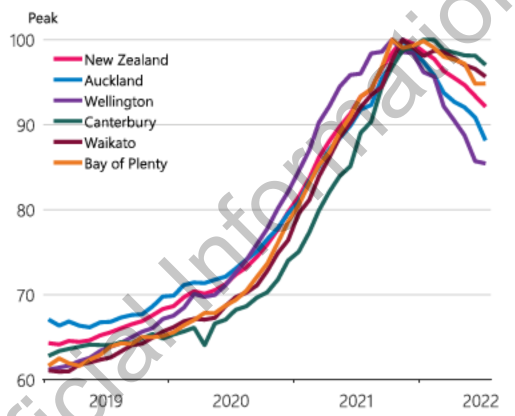


Figure 3: Value of monthly mortgage lending flows by buyer type (s.a.)

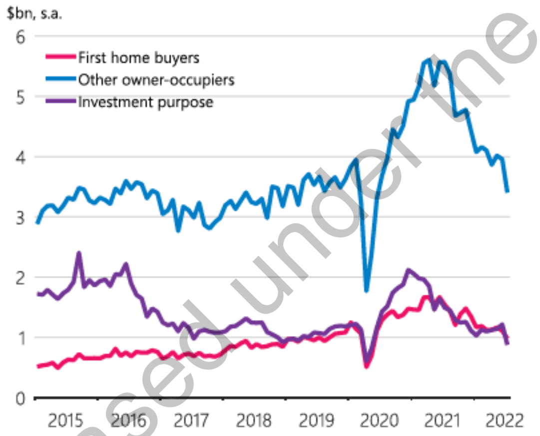
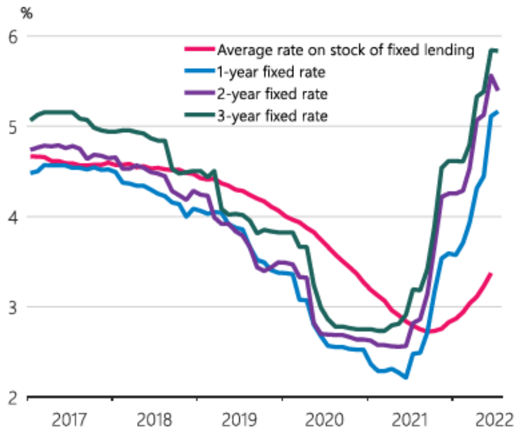


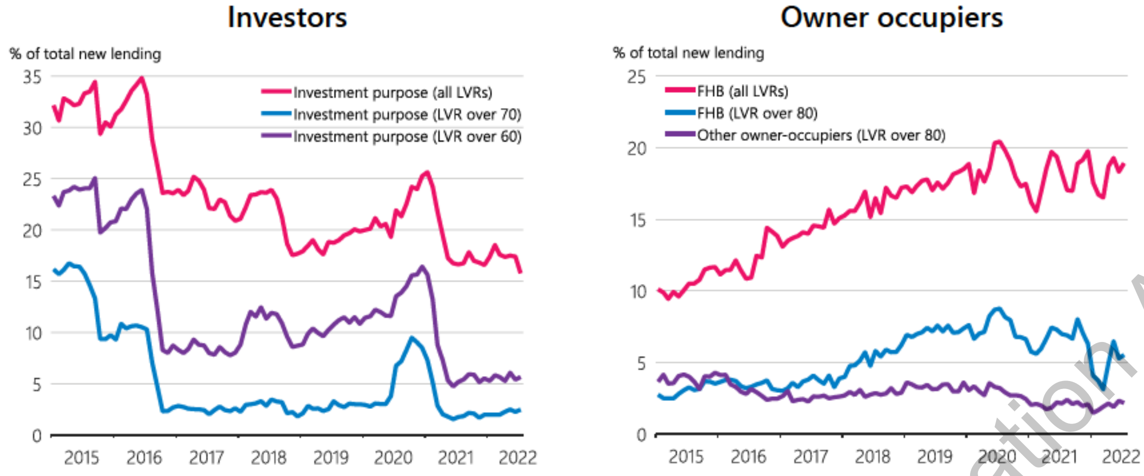
Figure 4: New fixed mortgage rates and average rate on existing fixed rate lending



Mortgage lending flows have slowed in line with the decline in sales volumes, refinancing activity and top-ups. Several developments have weakened demand for mortgage lending. The most significant development is the increase in mortgage rates. From January to June, 1-3 year fixed mortgage rates increased by 120-150 bps. Mortgage rates are now at levels last seen in 2017 in nominal terms, although they are still lower in real terms. More recently, some banks have announced cuts in mortgage rates as swap rates have fallen.

Tight LVR requirements have also contributed to weakening mortgage demand, especially for investors (figure 5a). Alongside tighter LVRs, government changes to the bright-line test and interest deductibility have also contributed to reduce investor demand, as after tax yields are lower for highly leveraged investors in particular. However, an exemption for new builds limits the impact of this change.

Figure 5a and 5b: Share of new mortgage lending by buyer type and LVR



Mortgage lending was also weakened by changes to the CCCFA that came into force last December which required lenders to perform more extensive checks of borrowers' income and expenses when calculating their net income surplus. An amendment to the CCCFA aimed at addressing the conservative implementation by banks and adjusting definitions came into force on July 7.

Assessment of risks

The current LVR restrictions are a maximum of 10 percent of new lending to owner occupiers at LVRs of 80 percent or higher, and a maximum of 5 percent of new lending to investors at LVRs of 60 percent or higher. Our updated macro-prudential policy decision framework outlines four key main considerations for reviewing policy settings:[1]

1. Assess the probability of a correction in house prices

2. Assess the resilience of households,

3. Assess the resilience of the financial system,

4. Assess the risk of spill-overs to the wider economy.

In this section, we provide an update of how we are seeing these factors. Table 1 provides a summary of the assessment.

1. Probability of a correction in house prices

House price declines in recent months mean that our models show current prices are closer to the sustainable level than they were at the start of the year (table 1). This suggests that the probability of a correction has diminished. However, house prices remain elevated relative to what we think is sustainable.[2]

[1] Memo to FSC "Housing and macroprudential policy update – Background paper", Graeme Cokayne, 2 August.

[2] See #9865028 for our Committee paper on our model suite.

***Table 1: Estimates of house price sustainability*[3]**

House Price over/under valuation	Valuation as at January 2022	Valuation as at June 2022
Investor asset pricing model (no leverage)[4]	+10.5%	+7.2% (overvalued)
Owner-occupier valuation (user cost model)	+16.8%	+10.3%
Mortgage to Rent Ratio	+13.9%	+10.4%
Pre-tax rental yields on residential property	+29.8%	+25.8%
Average debt servicing for 2-year mortgage	+29.0%	+20.1%

2. Resilience of households

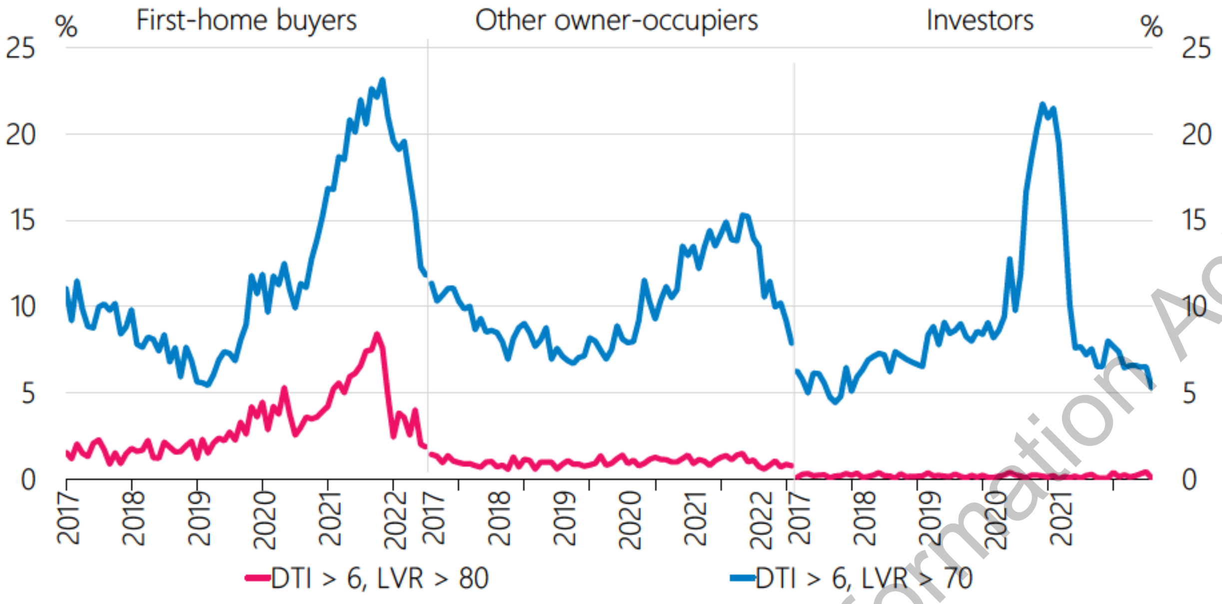
Overall, the household sector saw a substantial increase in aggregate net wealth during the past 3 years as a result of strong economic activity and rising house prices (figures A3 and A4). More recently, the value of housing wealth has eroded as house prices have fallen, however, households' balance sheets remain strong in aggregate as a result of previous gains.

Despite households' strong aggregate position to absorb housing and interest rate shocks, some vulnerabilities remain. Vulnerabilities remain concentrated among households that have borrowed recently at high LVRs and DTIs. Earlier cohorts of borrowers have begun to repay some of their debt and also experienced large gains in their equity positions as prices continued to rise through 2021.

Tighter LVR limits since early 2021 saw the flow of higher risk lending to investors decline sharply. In addition to the LVR restrictions, market contacts have reported that restrictions on tax deductibility of interest payments have meant that investors are finding it harder to pass banks' debt servicing assessments, and as a result many property investors are borrowing from non-banks. Banks have tended to allocate their high-LVR owner-occupier lending allowance primarily to first home buyers, although this lending has also declined from its recent peak (figure 6).

[3] Note that we have added a model comparing rental yields to long-term bond yields which has increased the top of the range compared to previous estimates.
[4] Investor asset pricing model (with interest deduction tax policy change) +47.1% (overvalued) with 70% leverage

Figure 6: Higher risk (both high-LVR and high-DTI) shares of new lending by buyer type



2.1 Resilience of households to a decline in house prices

We can simulate the impact of further correction in house prices towards sustainable levels and back to pre-COVID levels. A decline of around 30 percent in house prices would take prices back to levels in early 2020.

A 30 percent decline in house prices from current levels would now result in around 20 percent of the total stock of lending falling into negative equity (figure A7). This is an increase from around less than 10 percent falling into negative equity from an equivalent shock six months ago. This is because some earlier borrowers have had some of their housing equity buffer eroded by the fall in house prices that have occurred. However, the tightening of LVR restrictions means recent borrowers should be better able to absorb a house price correction than some earlier borrowers with lower deposits.

The risk of negative equity is largely concentrated among owner-occupier lending (figure A8). A 30 percent fall in prices from current levels would see less than 1 percent of investment lending fall into negative equity, owing to the much tighter LVR requirements in place on investors.

2.2 Resilience of households to mortgage rate increases

A significant share of fixed mortgage debt is expected to reprice at higher mortgage rates in coming months, increasing the effective mortgage rate and raising debt servicing costs for households (figure A5). During 2022 overall, around 50% of the stock of fixed mortgage debt will reprice.

Based on monetary policy expectations priced into the swaps market, mortgage interest rates are projected to be close to their peak. In recent weeks, several banks have cut their mortgage rates. Bank test rates for debt servicing assessments have also increased in recent months as wholesale interest rates have risen, and most are now around 7.5% or above. This provides a degree of confidence that recent borrowers should be able to absorb further rate increases if they occur. Households who borrowed during 2020-2021 when mortgage rates were at low levels should still be able to service debt at current rates, as test rates during that period were around where mortgage rates are currently (figure A6), however further interest rate increases beyond what is currently expected would start to exceed these buffers.

While test rates suggest that most borrowers should be able to absorb current or slightly higher interest rate levels, some borrowers would need to cut back on other discretionary consumption in order to make their loan repayments (figure A9).

First home buyers are most exposed to the impact of higher serviceability costs as they tend to have lower income levels and smaller buffers to absorb higher costs. Around 50 percent of lending to first home buyers would require some reduction in discretionary spending to continue servicing mortgage payments if interest rates rose above 7 percent. A reduction in discretionary income would have flow-on impacts for broader economic activity.

3. Resilience of the financial system

The financial system should be able to cope with impact of the recent house price reductions and further corrections. The level of bank capital held relative to the level of mortgage lending has increased significantly in recent years putting banks in a better position to absorb potential losses on their mortgage portfolio (figure A10).

In addition, the 2021 bank solvency stress test assessed the resilience of the five largest banks to a severe economic downturn involving a 39 percent fall in house prices and a rise in the unemployment rate to 11.8 percent. The stress test exercise showed that the banking system would on the whole be able to cope with the impact of plausible levels of mortgage borrower stress. The 2022 stress test scenario will feature a substantial rise in mortgage rates, combined with a recession and high unemployment

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As noted above, many borrowers will re-price their mortgages in coming months on to higher interest rates. This upward repricing will necessitate some reduction in discretionary consumption in response to serviceability pressures, particularly among recent first home buyers. Recent high inflation may also reduce households' discretionary spending if wage increases continue to not keep up with inflation. However, households should continue to be able to service their mortgage payments as long as the labour market remains tight with unemployment at historic lows, reducing the likelihood of negative income shocks due to job loss.

We remain mindful of potential negative wealth effects from falling house prices and also the effects such a decline could have on residential construction activity. Market contacts have reported that the pipeline for residential construction has slowed sharply recently as rising interest rates, falling house prices and supply chain uncertainty have led to a large decline in pre-sales. In addition, historically high debt levels could make consumers particularly sensitive to a rising interest rate environment. Offsetting these factors, negative wealth effects could be muted by the wealth accumulated by households during the previous period when house prices were rising. The tighter LVR restrictions introduced last year should also mean that recent borrowers are better able to absorb a further correction in house prices.

The net effects of these factors on economic activity are difficult to measure. On balance, we assess the risk of spill-over effects to the economy as currently moderate but rising slightly compared to six months ago.

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Resilience of financial system		• Bank capital ratios remain above current requirements		• Banks' capital buffers for mortgage lending have increased. NO CHANGE
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	Significant risk of house price correction. Low resilience in the household or banking sector to a housing shock. High spillovers to the wider economy from a housing shock.
	Moderate risk of house price correction. Moderate resilience in household or banking sector to a housing shock. Moderate spillovers to the wider economy from a housing shock.
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	An assessment is near the threshold between two risk categories.

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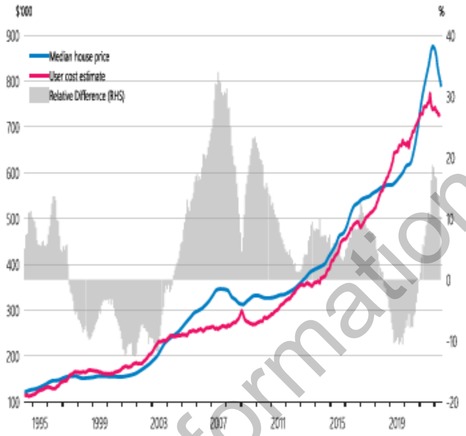

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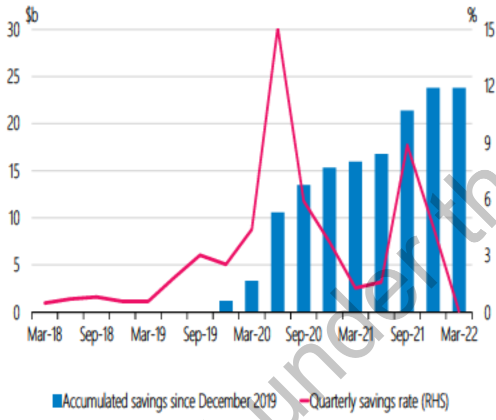
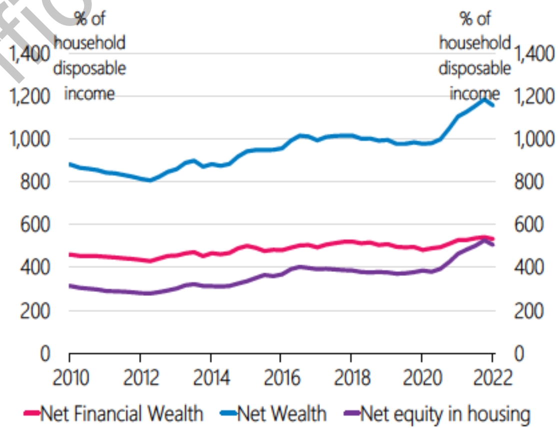


Figure A4: Household net wealth as % of household disposable income



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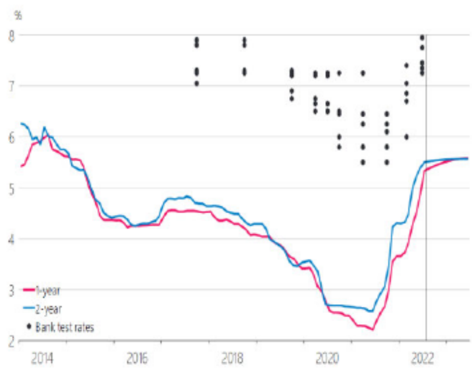

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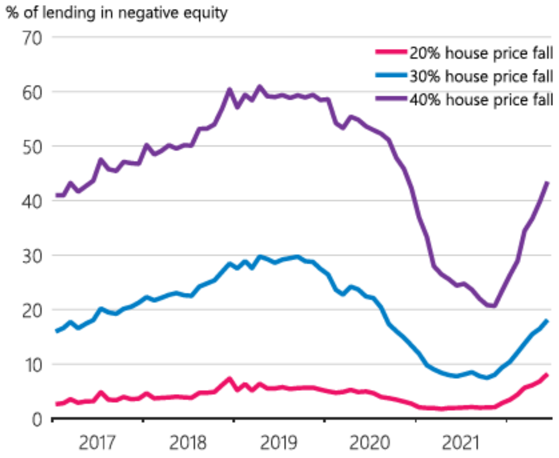

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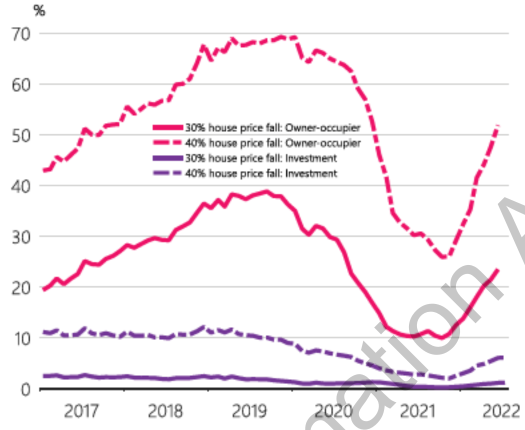

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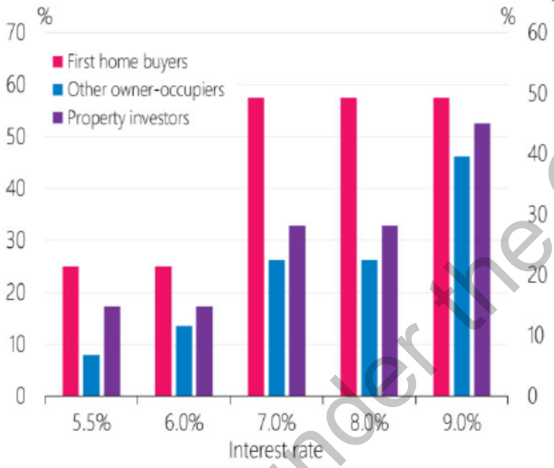

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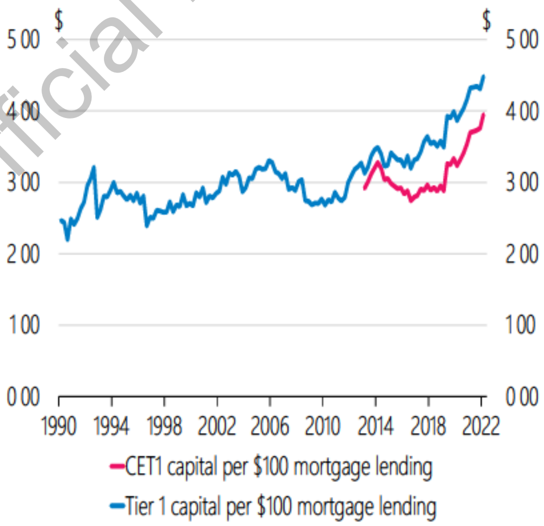


Document 5

Reserve Bank of New Zealand
Te Pūtea Matua

Reserve Bank Financial System Roundup

To	Hon Grant Robertson, Minister of Finance	**Date**	01/12/2022
Authorised by	Kerry Watt, Director of Financial Stability Assessment & Strategy	**Report no**	#5981
Prepared by	Patrick Carvalho, Rebecca Newman, Matthew Brunt	**Security**	In confidence

Action Sought

Action sought	Deadline
Please note the attached briefing	

Reserve Bank Contact for Telephone Discussion (if required)

Name	Position	Telephone
Chris McDonald	Manager, Financial System Analysis	+64 04 471 3634

Actions for the Minister's Office Staff

Note any feedback on the quality of the report.	

Recommendation

1. It is recommended that you:

   a) Note the attached briefing

Hon Grant Robertson

Minister of Finance

Kerry Watt

Director of Financial Stability Assessment & Strategy

Reserve Bank of New Zealand - Te Pūtea Matua

01/12/2022

Financial System Roundup

01 December 2022

For further information, contact:

Chris McDonald, Manager of Financial System Analysis, RBNZ Chris.McDonald@rbnz.govt.nz

Financial Stability Focus

- In this month's report, we provide a summary of our 2022 Stress Test Programme. This includes results from our bank solvency stress test, focussed on a stagflation scenario, and on residential mortgage exposure to a range of coastal, river and surface water flooding risks.
- Our annual stress testing programme enables us and banks to better understand the implications of current and emerging risks to bank balance sheets, and overall financial stability by investigating severe but plausible scenarios.
- Results from our 2022 Bank Solvency Stress Test show the New Zealand banking sector is well placed to withstand a stagflation scenario, where high inflation is paired with negative economic growth. This resilience is partly due to the build-up of capital since the Global Financial Crisis.
- Our assessment of banks' residential mortgage exposure to river and surface water flood risk indicates that in a severe scenario, more than a quarter of the banks' current Auckland mortgage lending is on land that could be impacted by flooding. The results indicate that river and surface water flooding may pose a greater risk to bank residential mortgage portfolios than coastal flooding.

Global Economic Developments

- The outlook for global growth has continued to deteriorate, with more visible signs of slowing in recent economic activity.
- Headline inflation measures have declined slightly in several developed economies, driven by lower energy and transport inflation.
- Central banks continue to tighten monetary policy at an unprecedented pace, but some are slowing or communicating their intent to slow the pace of tightening.

Financial Stability Focus

In this month's report, we provide a summary of results from our 2022 Stress Test Programme. This includes effects of a stagflation scenario on bank solvency and banks' residential mortgage exposure to coastal, river and surface water flooding risks.

Stress tests involve subjecting financial institutions to severe but plausible scenarios that are deliberately chosen for their potential to threaten the viability of their business model. By quantifying the impact of these scenarios on balance sheets and profitability, stress tests can help institutions to both measure and manage risk. We expect banks to invest in stress testing models and infrastructure, and carry out their own internal stress tests as part of their Internal Capital Adequacy Assessment Process.

Our findings confirm that New Zealand's banking system is resilient to most plausible scenarios, and highlight potential areas for banks to improve their risk management.

The Stagflation scenario

The 2022 Bank Solvency Stress Test[1] consisted of a stagflation scenario that shares elements of the current economic environment, i.e. a global slowdown in economic activity as central banks raise interest rates in the face of high inflation and lingering impacts from the pandemic. Specifically the scenario, which was assumed to begin on 1 April 2022, included:

- House prices falling 42% (47% from the peak in November 2021)
- Equity prices falling 38% (42% since December 2021)
- The unemployment rate rising to 9.3%
- Gross Domestic Product contracting by 5%
- The OCR peaking at 5.5% and the 2-year mortgage rate at 8.4%; and
- In addition to the economic scenario, banks were impacted by and required to model a 1-in-25-year cyber risk event.

Stress test results before mitigating actions

The scenario caused aggregate impairment expenses of $20.8 billion over 4 years, compared to the $1.7 billion real impairment cost of the COVID-19 pandemic over the past 4 years. Bank profits were negative in year 2 of the stress test. The combination of negative economic growth, rising interest rates and increasing unemployment lead to high levels of defaults, whilst falling asset prices reduced the collateral banks held to minimise losses in the event of a default. The cyber event lead to aggregate costs of $1.3 billion.

The aggregate CET1 ratio in the stress test fell 3.3 percentage points to a minimum of 8.9 percent before mitigants, which remains above the regulatory minimum (Figure 1). The aggregate total capital ratio fell by 4.3 percentage points to a trough of 10.3 percent, closer to the regulatory minimum ratio in year 3 when the minimum requirement will increase (Figure 2).

[1] 2022 Bank Solvency Stress Test Assessing the resilience of banks to a stagflation scenario – Reserve Bank of New Zealand – Te Pūtea Matua (rbnz.govt.nz)

Figure 1: Aggregate total capital ratios

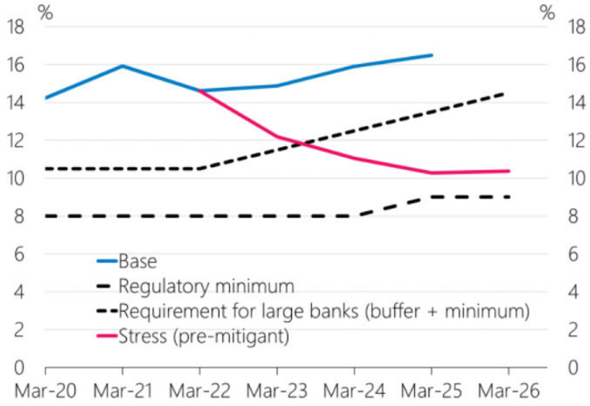
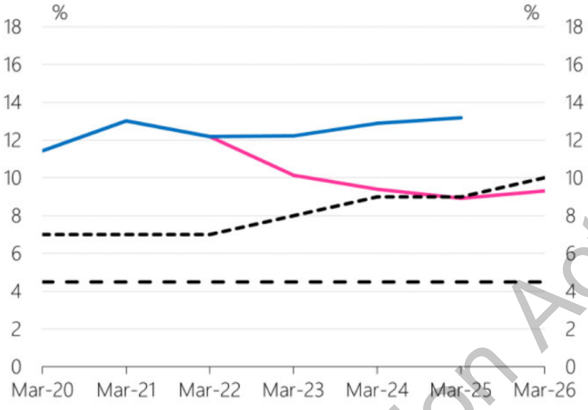


Figure 2: Aggregate CET1 ratios



Sources: RBNZ *Capital satellite* survey, bank solvency stress submissions, RBNZ calculations.
Note: Base case projection to year 3 only from bank projection data.

Mitigating actions

As part of our stress testing, we ask banks to consider mitigating actions that they could use in such a scenario. These differ across banks in both size and timing, and are less certain in a stress environment. Table 1 shows the main mitigating actions taken by banks to increase capital ratios, compared to what was included in the pre-mitigating results.

After applying mitigating actions, the aggregate total capital ratio is well above the regulatory minimum as shown in Figure 3. However, four banks remain within the PCB at the end of the stress scenario. It is likely that a long period without dividends and/or capital raisings would be needed to meet the 2028 capital requirements.

Figure 3: Aggregate total capital ratio after mitigating actions

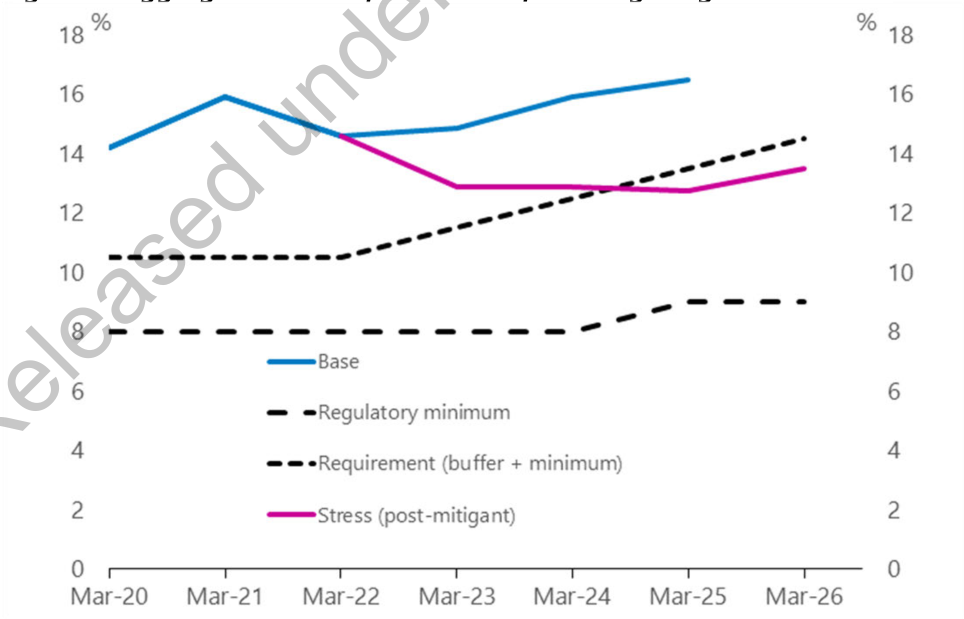


Table 1: Mitigating actions taken by banks

	Pre-mitigating submissions	Mitigating Action
Capital raisings	No equity injections or issuance of capital instruments	Equity injections and issuance of Tier 1 and Tier 2 capital
Dividends	Dividends fall in proportion to profits subject, to regulatory restriction.	Further reduction or cancellation of dividends.
Revenue	Banks adhere to prescribed guidance on retail deposit and mortgage rates.	Some repricing of retail customers deposits to improve profits.
Expenses	Expenses similar to the base case, adjusted for any automatic reductions such as profit related bonuses.	Further cuts in discretionary spending and reduction in headcount.
Impairments	It is assumed defaulting customers are not returned to non-defaulting state.	Providing assistance to customers to reduce the amount of defaults and/or improve the return they received from defaulted customers.
RWAs	Required to maintain market share growth in line with the prescribed lending growth rates of the scenario.	Not replacing maturing business and having higher loan to valuation ratio for new mortgage lending to reduce risk weighted assets.

Sources: RBNZ *Capital satellite* survey, bank solvency stress submissions, RBNZ calculations.

Conclusion

The results of the 2022 Bank Solvency Stress Test show that in this severe scenario banks would need to use their capital buffers, as they are designed to be during a period of stress. In aggregate, banks would be able to continue to operate but some would face more stress than others. Most banks would need to initiate mitigating actions (such as capital issuance, dividend restriction and expense reductions) to replenish their capital buffers and to meet the rising capital requirements being implemented in accordance with the revised capital adequacy framework.

While the 2022 stress test shows that banks are resilient to a severe scenario and would remain well positioned to support the economy, this scenario would be a challenging macroeconomic environment for households and businesses. Some households would be unable to repay their loans and many more would experience large declines in wealth.

Residential mortgage exposure to flooding risks

The financial system is exposed to a range of risks from climate change. Financial institutions have been making progress towards identifying and understanding these risks over the last few years, partially in preparation for disclosure under the Financial Sector (Climate-related Disclosures and Other Matters) Amendment Act 2021.

In this section, we present headline results from our assessment of flooding risks to banks' residential mortgage portfolios, including coastal flooding risks, and river and surface flooding risks. Further detailed analysis of the results will be published in a forthcoming Reserve Bank Bulletin article. Results from the second component of our Climate Change Risk Assessment, focussing on transition and physical risks for banks' agricultural exposures, will be published in the first half of 2023.

Our long-term aim is to support banks to build their capability to measure climate risks and find solutions to the significant data and modelling challenges involved. In turn, this should lead to more proactive management of climate risk.

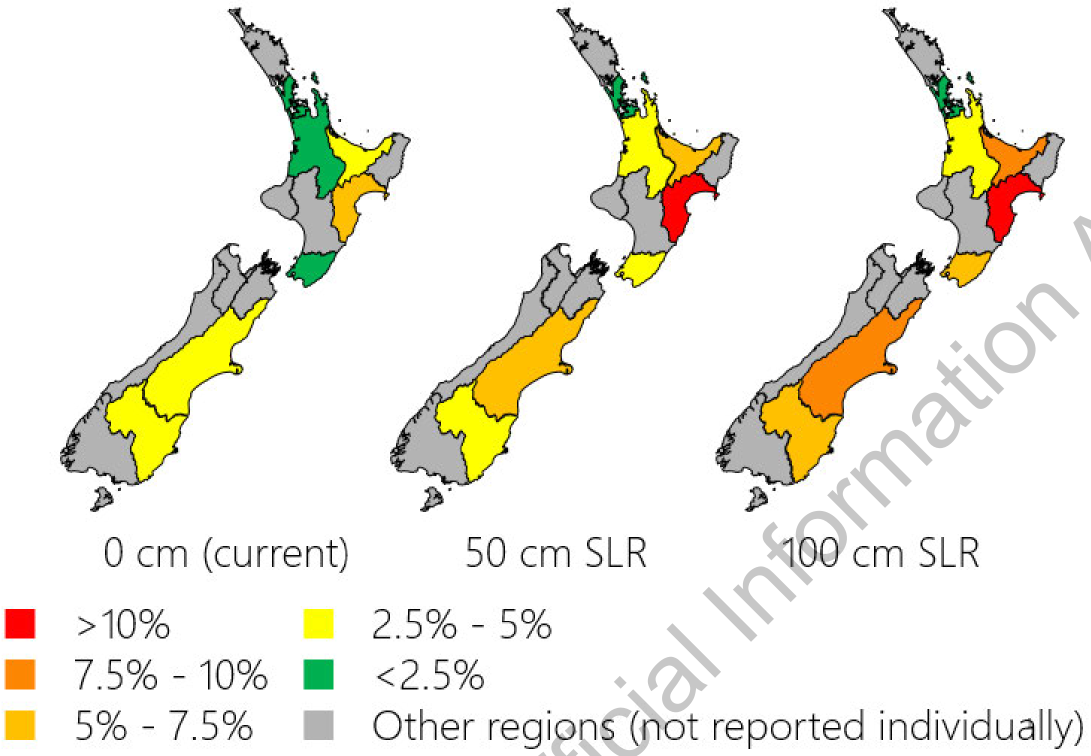
Coastal flooding: regionally concentrated exposures

In this exercise, banks measured the coastal flooding exposure in their current residential mortgage portfolios under varying levels of sea level rise. A property was considered 'at-risk' if any part of its land area was inside the flood zone for a 1-in-100 year storm tide event.

Across the participating banks, we found that 1.2 percent of mortgage lending was in a coastal flood zone at the current sea level. This would jump to 1.8 percent with a further 20 centimetres of sea level rise, 2.5 percent at 50 centimetres, and 3.8 percent after another one metre of sea level rise from the current level.

We found that coastal flooding was more concentrated in particular regions. Canterbury made up the largest share of mortgage lending exposed to flooding, at 22 percent of the national total (at 50 centimetres of sea level rise). At the regional level, however, Hawkes Bay is the most exposed region with 15 percent of mortgage lending in the flood zone at 50 centimetres of sea level rise, as shown in Figure 4.

Figure 4: Share of mortgage lending in the 1-in-100 year storm tide flood zone by region



River and surface water flooding results for Auckland

Data for assessing river and surface water flooding is less advanced in New Zealand. Given this, we restricted this component of the exercise to Auckland. Participating banks relied on publicly available Auckland Council flood map data to complete this exercise. From this, we found that a quarter of banks' current mortgage lending in Auckland was in a 1-in-100 year flood zone, when modelled rainfall levels increased to align with a 2.1 degree Celsius rise in temperature. This is equivalent to around 12 percent of participating banks' total mortgage lending.

Implications for the financial system

This exercise examined how banks' current mortgage portfolios may be affected by flooding risks benchmarked to climate scenarios out to 2100. As banks gain an improved understanding of the risk from flooding, they may look to change their lending requirements to mitigate risk. Work done independently by banks, mandatory climate-related disclosure, and our climate stress testing activities are all helping to build capability within the financial sector to measure and manage climate risk.

Global Economic Developments

Weakening economic activity indicators foreshadow a decline in global growth

The outlook for global growth has continued to deteriorate, with more visible signs of slowing in recent economic activity. This weaker outlook reflects spill overs of the Ukraine war, zero-COVID controls in China, tighter financial conditions, and a substantial slowdown in housing activity across the globe. However, labour markets in advanced economies remain very strong, with unemployment rates in most of our key trading partners close to record low levels.

Global inflationary pressures remain broad based

Headline inflation measures have declined slightly in several developed economies, driven by lower energy and transport inflation (Figure 5). Differences in exposure to the war in Ukraine continues to explain some of the geographical variation in inflationary pressures. However, inflation still remains well above central bank targets and recent data suggests underlying inflationary pressures are stronger than previous expectations, with core inflation proving particularly resilient.

Central banks continue to tighten conditions at an unprecedented pace, but some are slowing or communicating their intent to slow the pace of tightening

The Bank of England, Reserve Bank of Australia, and US Federal Reserve all increased their policy rates in November as central banks continue to tighten monetary conditions. With the exception of Japan, major advanced economy central banks have each increased policy rates by a cumulative amount of between 225 and 350 basis points through 2022. However, some have recently communicated an intent to slow the pace of increases, citing risks from the lagged impact of monetary policy, as well as the synchronised nature of global monetary policy tightening. Nonetheless, markets are still pricing policy rate increases at a historically fast pace.

Global risk sentiment has improved slightly

International equity indices have recovered somewhat from large declines year-to-date: the US S&P 500 index has risen by about 3 percent in November, and the Euro Stoxx 50 index has increased by 7 percent (Figure 6). On net, 10-year yields have decreased by 15 basis points in Germany and 35 basis points in the US, and the New Zealand dollar has appreciated slightly against the US dollar. Measures of market volatility remain elevated, but have declined somewhat from recent highs.

Figure 5: Headline inflation in key trading partners

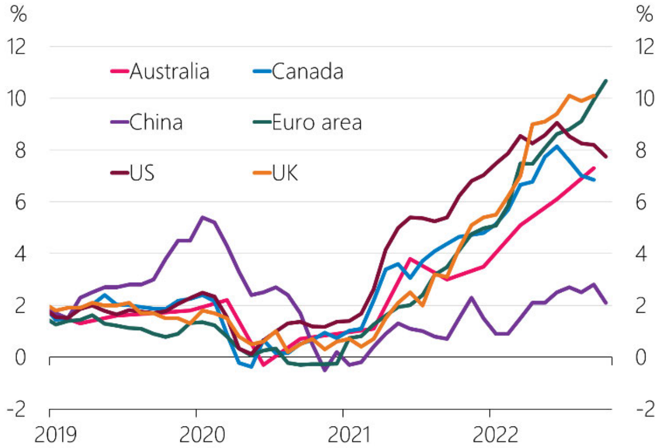
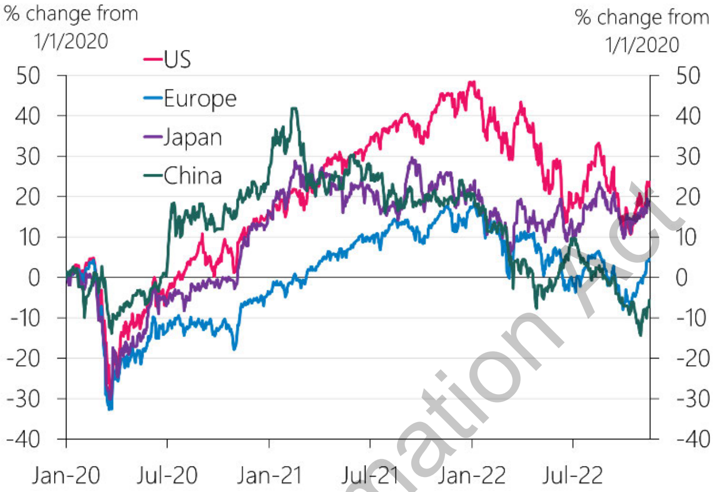


Figure 6: Equity market indices



Sources: Haver Analytics; Bloomberg.

Document 7

Reserve Bank of New Zealand Te Pūtea Matua

Memo for Financial Stability Committee

Copied to	FSAS managers
From	Financial System Analysis
Date	13 September 2022
Subject	November 2022 FSR bank liaison meetings
Value(s)	Tauira/Integrity
For your	Information

Purpose

- The next Financial Stability Report will be published on 2 November 2022. As part of the FSR process, Financial System Analysis conducts a liaison programme of discussions with the five largest banks. These discussions aim to identify key trends and emerging risks in the financial system.

- This paper provides a summary of the feedback we received from banks through our meetings. Meetings were held between 22 and 27 August. Our discussions generally involve bank treasurers, heads of credit risk management, and heads of product divisions.

Key trends and emerging risks

Rising interest rates

Tightening in monetary policy domestically and overseas, and expectations of further tightening, have driven interest rates materially higher from 6 months ago. Additionally, funding costs are being bolstered by increased competition for deposits and perceived risk in offshore wholesale markets. Higher lending rates and serviceability test rates have dampened credit growth, among other factors.

Low unemployment rate

The labour market is very tight. Firms generally face high wage pressures, and many sectors are experiencing a shortage of staff, exacerbated by high illnesses partially because of COVID. However, the strong labour market also supports household debt serviceability, meaning arrears and defaults have remained low despite the increase in interest rates.

High inflationary pressures

The inflationary environment continues to raise business costs, in addition to interest rates through monetary policy. Firms continue to face sharply higher costs for fuel, materials and services. Uncertainty around cost and other factors dampened investment intentions, although lending for working capital remains robust. That said, most firms are able to pass on costs to maintain their margins, and adjust to supply chain disruptions.

Housing market downturn

Residential mortgage demand has fallen, owing to the decline in housing demand, as well as tighter serviceability requirements around interest rates and expenses. The CCCFA guidelines remain a constraint on lending, despite some supportive changes recently. Negative equity is modest at this stage, and rising interest rates have not yet led to borrower stress. Amid ongoing construction cost inflation and declining loan serviceability, buyer demand for off-the-plan house purchases (presales) has fallen considerably. There are major downside risks for residential construction once current pipelines are completed.

Items discussed

Bank funding/ balance sheet

1. Wholesale market funding conditions have become more volatile in the past six months, owing to uncertainty around the inflation outlook, the response of central banks, the war in Ukraine, and idiosyncratic factors specific to the institution. In general, offshore funding markets have become more expensive. That said, interest in high-quality issuance remains high, and market liquidity and pricing have been reasonable.

2. The Funding for Lending Programme has been helpful as a backstop against volatility in the offshore funding markets. Banks are generally not concerned with its removal at this stage. The end of FLP in December is expected to increase competition for term deposits.

3. Monetary policy tightening and rising interest rates are incentivising savers to move back into term deposits from transaction and on-call savings accounts. Term deposits are opening at a longer duration than 6 months ago. This has increased banks' retail funding costs, because term deposits earn higher rates of interest than call accounts. However, higher spreads on call accounts and reduced liquid asset requirements help to offset costs.

4. Previous volatility in offshore wholesale funding markets was led by risk premiums owing to the Ukraine war. However, volatility has been increasingly driven by changes in the inflation outlook and expectations of monetary policy moves, which affect the risk-free component of wholesale pricing. Pricing has been volatile in both directions owing to the ebb and flow of monetary policy-relevant developments.

5. Overall loan growth has continued to slow owing to a marked decrease in mortgage applications, and continued weakness in agricultural and personal consumer lending. This has helped to narrow the funding gap and limited the need to raise wholesale funding.

6. Meeting the increased capital requirements will be achievable through retained earnings. Net interest margins and profitability have been stable, owing partly to healthy asset quality. Banks are starting to issue new AT1 and Tier 2 capital instruments.

Residential mortgages

7. The demand for residential mortgages has continued to decline since the March quarter, from their peaks in 2021 and even compared to 2019 levels. The slowdown is broad-based, across all types of buyers and most regions. Contributing factors to soft mortgage demand include higher interest rates, lingering CCCFA impacts, and low confidence.

8. The updates to CCCFA rules still have a significant impact on lending requirements, leading expense benchmarks to be an estimated 8 percent higher. CCCFA continues to impose a large process cost, as the penalties for getting the interpretation wrong are high. That said, the recent relaxation to CCCFA has eased the burden a little, as lenders no longer have to count savings/investment as an ongoing expense.

9. Mortgage serviceability standards have tightened. Rising interest rates have driven the serviceability test rates higher, to around 7.5-8 percent on average, although this setting is dynamic. Banks have substantially increased their living expense benchmarks to account for high inflation and CCCFA changes, and some signalled more to come. The net income surplus requirement for loan approval has increased. Some banks have cut their appetite for riskier types of mortgage lending, such as bridging finance.

10. Falling mortgage demand mirrors the decline in house prices, although there is considerable regional variation. Wellington is down about 15 percent from late 2021, although other cities are seeing smaller falls. Some banks are assessing the extent of negative equity, which is believed to be concentrated in a small number of borrowers who purchased in the second half of 2021, when prices were high. Negative equity by itself is not viewed as a risk insofar as these borrowers can continue to service their debts.

11. There are no signs of mortgage serviceability stress at the present time, with asset quality remaining high. Borrower resilience is supported by solid past origination standards, strong nominal growth in their labour incomes, a tight labour market and ability for landlords to pass costs onto rents. Banks do not think delinquencies will increase materially without a sharp increase in the unemployment rate.

12. That said, recent borrowers composing 2-4 percent of the book are in negative equity, and much of the mortgage book has not yet repriced to higher rates. We may see a lagged

increase in stress over time. Banks have signalled a willingness to work with stressed borrowers, who may have options such as interest-only or a term extension.

13. Personal consumer lending remains on a trend decline across banks. Non-bank lenders and buy-now-pay-later schemes are becoming more active, and posing a competitive challenge to banks. Credit card usage appears to be in decline among both households and businesses.

Residential development

14. The strong pipeline of residential development projects in 2021 has ceased. The downturn in the housing market and cost pressures in construction have led to buyers perceiving high risk in purchasing off the plans. Developers are not getting significant pre-sales, with anecdotes of presales falling around 80-90% on 2021 levels.

15. Residential developers are struggling to get finance from banks, due to inability to meet the pre-sale requirements. Banks have not changed their lending standards for residential development per se, but developers are struggling to meet existing standards. Banks are generally incentivised and willing to support existing customers with additional finance to deal with cost escalation, and will work with customers if they come under stress.

16. Banks are cautious in lending to new build buyers without a fixed price contract. Some banks are applying 15% contingencies to prospective new build buyers' borrowing amounts, reducing borrowing capacity. Therefore, there is an adverse dynamic going on whereby cost escalation constrains pre-sales finance, which constrains developer finance. Meanwhile, existing and turnkey properties are falling in price, making them a relatively more attractive (and certain) option for home buyers.

17. Supply constraints associated with materials and logistics, which were major a couple of months ago, have started to ease. However, difficulty in finding qualified staff continues to be a challenge. There remains significant uncertainty in the cost of projects, and with the housing market downturn, there is a risk the end price cannot be raised to compensate for cost escalation. Developer margins on current projects have been eroded by construction cost inflation.

18. There has been no significant increase in default or delinquencies in the residential development lending portfolio. However, developers are utilising credit limits and overdrafts to a greater extent, which may be an emerging sign of cashflow stress. Some developers that purchased properties at higher prices for redevelopment in late 2021 now face the prospect that once viable projects are now unlikely to proceed. However, banks do not consider they have a material exposure to losses in these situations, partly due to LVR requirements.

Business lending

19. There is a divide in credit demand between small and large businesses. Demand for SME lending has been steady with only modest growth expected over the coming year. Demand from larger corporates with sizable exposures has been relatively high. Credit demand is driven by working capital needs, as businesses deal with cost escalation, staff turnover and lingering supply chain bottlenecks.

20. The labour market is extremely tight and firms are competing aggressively for workers, leading to elevated wage pressures. Among existing staff, absences have become more frequent as workers or others in their household became sick due to COVID and other illnesses. The cost of material inputs remain high, as supply chain disruption persist. Higher wages and material costs have put downward pressure on firms' margins. However, most businesses have been able to pass on their cost to end prices, and were better at adjusting to a tighter inventory supply chain than labour shortages.

21. Investment intentions are dampened by uncertainty in the economic outlook and rising interest rates. Large businesses continue to borrow to make some investment in plant and machinery, and acquisitions. However, smaller businesses are much more cautious. Some businesses, particularly manufacturers, are investing in automation to address the labour shortfall, but in most cases the labour shortage limits the benefit of capacity investment.

22. Tourism, hospitality and retail, are more exposed to staffing difficulties and COVID disruptions than other sectors. The border reopening will not help much in the short-term, if tourism and related services cannot scale up to meet demand. There is also no evidence that the reopening is producing a net inflow of much-needed labour. Moreover, restaurants and retailers are reportedly less able to pass on increased cost to end prices.

23. Asset quality in the business portfolio remains solid, despite the increase in interest rates and salient challenges. However, there has been an increase in the utilisation of working capital credit limits, which could point to emerging serviceability stress. There could be lagged stress coming through as the lending book reprices. Banks are willing to support viable existing customers with credit lines and work with any potentially stressed clients rather than foreclose them outright.

Commercial property

24. Industrial properties have been performing well, driven by strong post-COVID demand from the logistics industry and constrained supply. Vacancy rates are exceptionally low at less than one percent, and rental growth has been high.

25. Office properties' performance remains mixed across different quality grades. High quality office space has seen strong performance, with tenants prioritising collaborative and attractive workspaces amid the prevalence of hybrid working. Lower quality offices face

muted tenant demand, and greater challenges around earthquake and environmental standards. As the shift to hybrid working reduces overall space requirements, tenants of lower-tier offices prefer to 'trade-up' to higher-quality spaces than attempt to negotiate down rents. These trends are expected to continue gradually, owing to the generally long lease periods tenants are locked in to.

26. Demand for retail properties is subdued, and vacancy rates are increasing. Standalone shops and small shopping strips are affected by the remote working trend, the lack of international tourism and more cyclical macroeconomic challenges. However, there is a degree of flight to quality, with large shopping centres and supermarkets generally doing better.

27. Banks are quite cautious around lending to new commercial property clients owing to the deterioration in the economic outlook. Banks have not changed their lending standards in general, but many customers cannot meet existing standards. However, most banks have reduced their interest coverage ratio requirement in line with the rise in interest rates.

28. There has been no significant increase in arrears or signs of customer serviceability stress, partly as interest rates, property valuations and rental contracts are yet to adjust to the new environment in most cases. Banks are willing to work with clients under stress.

Agriculture lending

29. Dairy farmers have focused on repaying debt since 2019, which was facilitated by high commodity prices. The deleveraging has occurred across the board, including the highly indebted tail of dairy farmers. Dairy prices have recently come off a peak, but remain at a high level, which should continue to support the deleveraging trend.

30. Deleveraging and diversification by banks have reduced dairy's share of banks' agricultural portfolio, and the size of the agricultural portfolio in recent years. However, banks are looking to grow their dairy book again by on-boarding new customers, owing to the improvement in farmers' balance sheets and credit quality in general.

31. Farmers appear to be able to adjust to recent environmental regulations including around emissions pricing, although more work is needed to help farmers' understand the implications. Banks are improving their collection of data relating to farms' ESG performance, and some have tightened their lending requirements around ESG. The conversion of marginal dairy, sheep and beef farming land into forestry continues, owing to favourable carbon pricing, although this has recently focused on more marginal land and is at a small scale to date.

32. Inflation in the cost of farming inputs for example feeds and fertilisers, and labour shortages, continue to present short-term challenges for farmers, particularly for

horticulture and fruit growers who rely on the seasonal availability of labour. The border reopening has not led to a material increase in the availability of workers.

Document 8

Reserve Bank of New Zealand Te Pūtea Matua

28 October 2022

Key messages for Nov 2022 FSR

Overarching messages

- Downside risks to the global economic outlook are increasing. Central banks have rapidly tightened monetary settings to ensure inflation expectations remain anchored. The extent this response slows economic activity is uncertain.
- In New Zealand, the rising interest rate environment will challenge some households and businesses as house prices fall, debt servicing costs increase, and economic activity slows.
- The financial system as a whole is resilient. Banks' capital and liquidity positions are strong, and earnings and asset quality remain high.
- Recent stress tests have demonstrated banks' resilience to severe scenarios involving rising unemployment and interest rates, and declining house prices.
- It is important that financial institutions take a long-term view when supporting customers and allocating credit to the wider economy.

Global inflationary stress will test NZ's financial resilience (Adrian)

Central banks have rapidly tightened monetary settings to ensure inflation expectations remain anchored. Returning to low inflation will affect economic activity and employment in the near term but the extent of this trade-off remains unclear.

Financial markets have been increasingly volatile, as seen recently in the UK. In addition, the slowdown in China's residential property development sector and adherence to a zero-COVID strategy have contributed to slower economic growth there.

New Zealand is in a relatively fortunate position compared to many of our global peers given the strong labour market, anchored inflation expectations and a sound government fiscal position.

However, a severe downturn in our trading partners would reduce incomes of New Zealand households and businesses. A tightening in global financial conditions would also raise debt-servicing costs.

Ongoing high inflation reflects supply bottlenecks and labour shortages (Adrian)

Following the pandemic, inflation has been stronger and more persistent than anticipated. Global supply chain disruptions, food and energy supply shocks, labour shortages, and the lagged effects of fiscal and monetary policy support all assist in explaining the current high global inflation.

New Zealand's inflation rate at 7.2% is above our 1-3% inflation target, reflecting a mixture of global and domestic drivers. Prices for tradable goods and services (which reflect import costs) contribute to a little less than half of this inflation rate.

NZ's inflation rate is relatively well-placed internationally. Nations who are most impacted by food and energy price spikes and shortages stand out significantly with double-digit inflation rates.

House prices have fallen towards more sustainable levels (Chris)

The rising interest rate environment is weighing on asset prices globally. In NZ, house prices have declined 11% since their peak in November last year, falling back to May 2021 levels.

Rising interest rates have reduced mortgage affordability for new borrowers and dampened what investors are willing to pay. In addition, construction of new dwellings continues to outpace population growth and changes to zoning regulations (NPS-UD/MDRS) are increasing development opportunities, which over time will support lower house prices.

House prices remain above sustainable levels, as the rise in long-term interest rates this year has also affected our estimates of what is sustainable. This highlights the risk of further house price falls.

[If pushed for our estimate of sustainable HP level] Our range of metrics suggests house prices are between around 10 and 30% above their sustainable level. This is larger than 6 months ago because 1) the sustainable level of house prices has declined as long-term interest rates have increased and 2) updates to our suite of metrics.

Some households will face financial difficulties (Chris)

While households will generally be able to adapt to the rising interest rate environment, some households will be tested, with the most at risk being highly indebted 2021 borrowers.

Negative equity

Negative equity (where the mortgage is larger than the value of the house) is not widespread at present (given the rise in house prices and LVR restrictions) but would increase if house prices continue to fall further.

- *Negative equity statistics:* The portion of bank lending which is to borrowers who are currently in negative equity is 2%. This would increase to 7% if house prices fell a further 10% and to 18% if house prices fell a further 20%.

Negative equity on its own does not lead to losses to the financial system. It would take a rise in defaults as well as widespread negative equity to create material financial losses.

Debt serviceability

The share of disposable income dedicated to debt servicing across all mortgage borrowers is expected to rise from 9 percent to 20 percent based on current mortgage rates. This increase is from a low level and remains below the period from 2007-2009.

Within this, some borrowers will be particularly affected. The risks will increase as mortgage rates rise above what banks assessed borrower affordability at in 2021, which was around 6%.

- *Debt servicing statistics:* the portion of 2021 lending with interest payments greater than 50% of income is 9% at a mortgage rate of 5%, 24% at 6% MR, and 46% at 7% MR.

Around 20% of all mortgages will roll over onto significantly higher rates in the next 6 months and just under 50% over the next year. Given current market pricing, the average mortgage rate will rise to around 6% over the next year (from 4.0% currently).

First home buyers tend to borrow at lower DTI ratios than investors or other owner occupiers. This is because they tend to have lower incomes. The underlying mechanics are that banks typically calculate debt serviceability on a surplus income basis, and higher income households have proportionally more surplus income once core expenses are accounted for.

A key determinant of financial stress for households is if people start losing their jobs. A significant increase in unemployment would create financial stability risks. However, our bank stress test this year has shown that banks would be resilient even very severe scenarios.

It is important that financial institutions take a long-term view of customers by providing support to customers in stress.

Macroprudential policy settings remain appropriate for now (Christian)

LVR settings remain appropriate for now given house prices remain unsustainably high and concerns for some existing borrowers due to rising interest rates.

An easing in LVR settings would be considered if they were judged to be creating excessively tight lending conditions and we were confident that house prices were no longer above their sustainable level.

Timeline for 2021:

- We reinstated LVR settings at their pre-pandemic level in March 2021. This was after consulting on this from December 2020.
- We then tightened LVR restrictions for Investors in May (60/5) and tightened for owner occupiers in November (80/10).

Progress to operationalise a debt-to-income tool (Kate)

We will soon consult on operationalising a debt-to-income (DTI) tool for mortgage lending, aiming to make final decisions on the design in the first half of 2023. It would take a further 12 months from that point for the banking sector to be ready to implement such a tool.

We do not see an immediate need to introduce DTI limits given the current conditions in the housing market and recent tightening banks have made to their serviceability assessments.

Bank earning have been supported by the strong economy, allowing them to build their resilience (Christian)

A profitable banking sector supports financial stability by making banks more resilient.

Profitability acts as a buffer to absorb losses during stressed periods and has enabled banks to strengthen their capital positions, in advance of rising capital requirements. Profitability will also help to underpin investment in systems and puts banks in a stronger position to support their customers.

Recently, returns have been buoyed by the strength of the economy, very low levels of non-performing loans and a pick-up in net interest margins. Return on equity was 13.6% for the past year, higher than the past two years but around the 10-year average (close to 13%).

Lending and deposit margins (Christian)

Bank net interest margins have increased in the past six months (from ~2% to 2.14%) but are not unusually high given they remain around their 10-year average (2.12%).

This increase is part of a global trend seen in banks financial results in recent quarters reflecting the rising interest rate environment.

In NZ, around 20% of bank funding is on transactional accounts up from 15% pre-pandemic. These accounts don't usually pay interest, so as wholesale/benchmark interest rates funding costs do not tend to rise as quickly.

In addition, a slowdown in new lending has reduced the incentive for banks to attract deposits and likewise the funding for lending programme has provided an alternative funding source.

With the funding for lending programme ending this year, we expect deposit rates will increase relative to wholesale rates going forward.

The benefit of cheap deposits on bank margins has been partially offset by lending rates not increasing as quickly as wholesale interest rates.

2022 stress test results show resilience in stagflation scenario (Chris)

Our 2022 stress test shows that the bank sector would be resilient in a stagflation scenario that shares elements of the current economic environment.

The hypothetical scenario is severe but plausible (with unemployment at 9.3%, HPs declining 47% from peak, and mortgage rates peaked at 8.4%).

Although banks' capital buffers would be reduced in such a scenario, they would still remain above our regulatory minimum. This partly reflects the progress banks have made towards raising capital to meet higher requirements over coming years.

[If pushed on why we're not publishing individual results] We have continued with our previous approach to reporting aggregate and anonymised stress tests results only. We are considering publishing individual results for some future stress tests and will address this when we release our 3-year plan for stress testing in the first half of next year.

Monetary Policy Committee's focus is on containing inflation (Christian)

As noted in our May FSR, decisive monetary policy actions to keep inflation expectations anchored would be best for financial stability in the medium term.

In line with this, at the latest monetary policy review, MPC noted it remains appropriate to continue to tighten monetary conditions at pace to maintain price stability and contribute to maximum sustainable employment.

Mortgage rates have increased recently to around 6% reflecting that market participants see significant tightening to come.

As this tightening takes effect, demand will moderate as rising household debt servicing costs and declining household wealth slow consumption. Highly-indebted mortgage borrowers from 2021 will need to cut back their spending significantly.

To the extent that some borrowers come into difficulties, the banking sector is resilient, as shown by our bank stress tests this year.

Inflation is projected to return to the target range in 2024 Q2.

Unwinding of alternative monetary policy tools unlikely to test banks resilience (Christian)

We do not expect large effects from unwinding of alternative monetary policy tools. These changes have been well signalled and the withdrawal of liquidity will be gradual, given the pace of bonds sales and the extended window for the FLP.

Banks liquidity positions are currently strong with core funding ratios around the highest they have been.

Financial policy remit and the role of the Board (Christian)

The new Reserve Bank Act came into force in July this year giving the Reserve Bank Board overall responsibility for our operations and strategy.

As part of this, the Board is required to take account of the Financial Policy Remit which outlines operation objectives for financial policy, similar to the MPC remit for monetary policy.

The Remit outlines the Government's desired outcomes of a strong, efficient, and inclusive financial system, with a low incidence of failure of regulated entities.

Regard is also to be given to costs of regulation, and impacts on innovation, and allocation of resources, and several of the Government's wider policy objectives.

Regulatory prioritisation (Kate)

We have a large programme of work underway to review and modernise the legislation and regulatory underpinnings of the sectors we supervise.

Given the breadth of the work underway, and feedback from industry, we have prioritised our efforts towards our major legislative reforms (eg DTA/FMI/IPSA), along with completion of high-priority policy work (DTI/LPR/Capital review).

Given this prioritisation, in the past six months we have not launched any new major regulatory initiatives. We have also delayed and extended timeframes on several items on the existing regulatory work programme.

We are also working closely with our Council of Financial Regulators partners to enhance the co-ordination of our work.

Crown debt position remains a point of strength for New Zealand (Christian)

The Government's balance sheet remains strong and compares well with other countries.

The November Monetary Policy Statement will outline our assumptions for fiscal settings in the context of our overall economic projections.

Climate change flooding risks (Chris on stress tests, Kate on regulation)

Climate change presents a range of risks to the financial system which need to be measured and managed.

To build on industry efforts towards upcoming disclosure requirements, this year we are undertaking risk assessments of New Zealand's largest banks to key climate-related risks.

In Box C we outline results our preliminary work with banks to examine residential mortgage exposures to coastal, and river and surface flooding.

- For coastal flooding, we asked banks to measure the exposure in their mortgage portfolios under varying levels of sea level rise. The key results in figure C1 show that just under 4% of mortgage lending is exposed to 1-in-100 year storms given a 1 metre rise in sea level.
- For river and surface flooding, data challenges were much significant so we focused the analysis on Auckland. We found that in a severe scenario with increased rainfall, more than a quarter of banks mortgage lending was in the flood zone – suggesting this might be a greater risk to mortgage lending than from sea level rise.

The exercise shows the outcomes for flooding risks if the properties banks lend against were unchanged between now and 2100, and therefore highlights that banks should be considering flood risks more when making lending decisions to avoid being exposed in future.

Key facts

HPs fallen 11% from peak and are back to May 2021 level, 6 months prior to the peak

HPs are around 10-30% above our estimates of the sustainable level

Negative equity (share of total lending): Currently 2% // further 10% fall: 7% // further 20% fall: 18%

Average debt servicing costs for mortgage borrowers to increase from 9% to 20% by Q2 2023, which would remain below 2007-2009 levels.

New mortgage lending in 2021 makes up 25% of total bank lending

Portion of 2021 mortgage lending with interest payments greater than 50% of income is:

- 9% at a mortgage rate of 5%
- 24% at a mortgage rate of 6%
- 46% at a mortgage rate of 7%
- 65% at a mortgage rate of 8%

Banks tested mortgage affordability at rates around 6% in 2021. These have increased to around 8% currently.

Average/effective mortgage rate was 4% in September, up from 2.8% in September last year.

20% of mortgages will roll over in the next 6 months and just under 50% over the next year.

NZ inflation is 7.2%, with tradables goods and services contributing a little under half. This returns to the target range in 2024 Q2 in our August MPS projections.

Return on equity was 13.6% for the past year, higher than the past two years but around the 10-year average (close to 13%).

NIM for the past year is 2.14%, close to the 10-year average (2.12%).

20% of bank funding is from transactional accounts.

Climate change sensitivities:

- coastal flooding impacts 4% of mortgage lending at 1m SLR and 1-in-100 storm surge
- surface and river flooding impacts more than ¼ of mortgage lending in Auckland in a severe scenario with increased rainfall

Reserve Bank of New Zealand Te Pūtea Matua

Document 9

November 2022 FSR

Financial Stability Committee Risk Assessment

Financial System Analysis team, 27 September 2022

Overview

- Risk assessment and vulnerabilities overview
- Global and domestic backdrop
- Sectoral views:

i. Households

ii. Residential construction

iii. Businesses and commercial property

Risk assessment overview

- Strong and ongoing inflationary pressures are leading central banks to tighten monetary policy more aggressively than had previously been anticipated.
- New Zealand's financial system is well positioned overall to handle a rising rate environment. Banks are well capitalised, with strong profitability and asset quality.
- While COVID and supply chain issues have abated, downside risks to global economic growth are high (Russia/Ukraine, European energy markets, China housing market & COVID strategy, inflation persistence).
- New Zealand's housing market continues to decline as mortgage rates rise. Pockets of negative equity and servicing stress are not widespread at present but may grow as prices continue to decline and mortgages reprice. New construction is likely to slow significantly once current pipelines are completed.

Vulnerabilities assessment

Category	Vulnerability Level	Vulnerability Trend	Comment
Asset price valuations		⇘	Rising interest rates have contributed to price falls across a broad range of asset classes. New Zealand house prices are currently closer to, but still well above our assessment of their sustainable level.
Household balance sheets		⇗	Mortgage rates have risen faster than previously anticipated, and are approaching the levels at which 2020/2021 borrowers were stress tested. Buyers in late 2021 in some regions are now in negative equity, with potential for a significant rise if prices continue current downward trend. The riskiness of new lending has declined, on average, and the strong labour market continues to support servicing capacity.
Business balance sheets		⇒	High inflation, tight labour markets, and ongoing supply chain issues are creating a difficult operating environment, squeezing margins in some sectors. Commercial property and construction remain vulnerable. However, businesses are well placed to handle higher interest rates given deleveraging in recent years (dairy in particular).
Institutional resilience		⇘	Bank profitability is high and capital levels continue to increase. Banks are yet to see any deterioration in asset quality.
Liquidity and funding		⇒	Banks have sufficient core funding given the outlook for credit growth. The average duration of deposit funding will increase as FLP winds down.

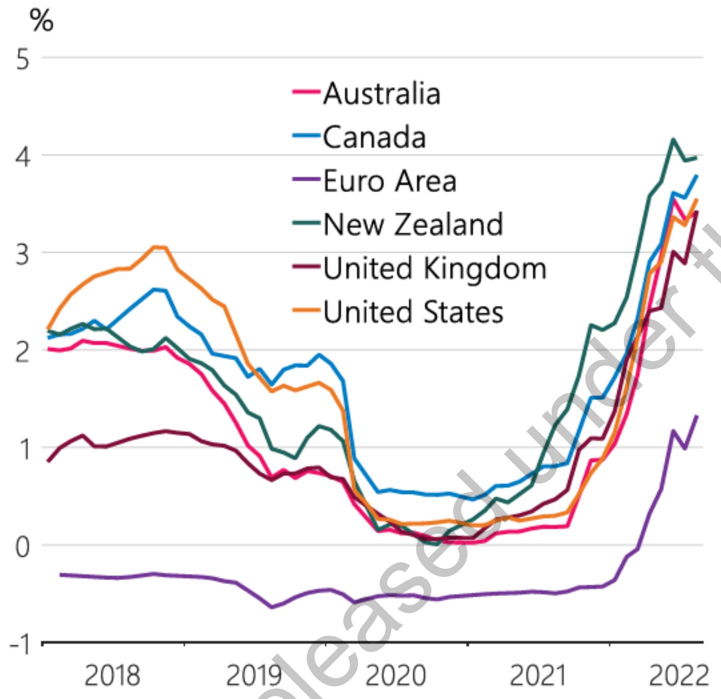
	Low		Moderate-high
	Moderate		High

⇗	Increasing
⇒	Steady
⇘	Decreasing

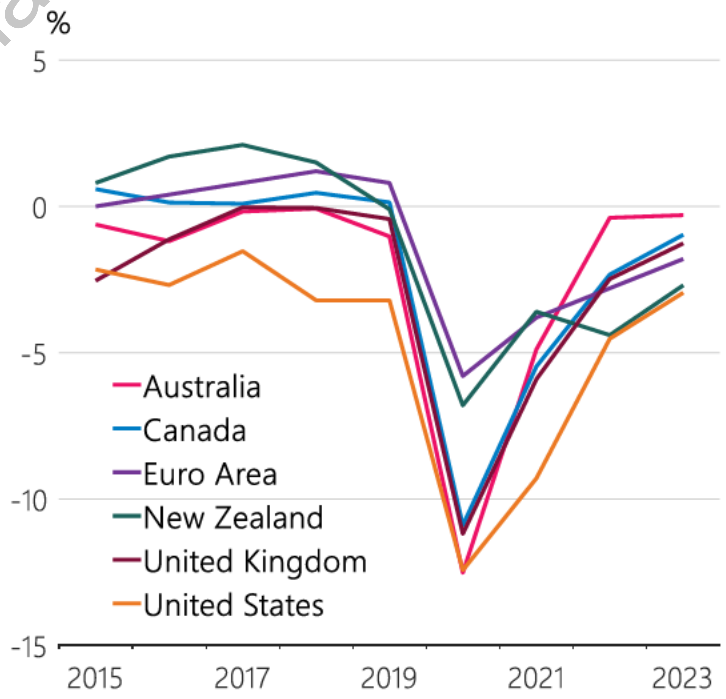
Global and domestic backdrop

Policy is tightening at a rapid pace

2-year swap rate

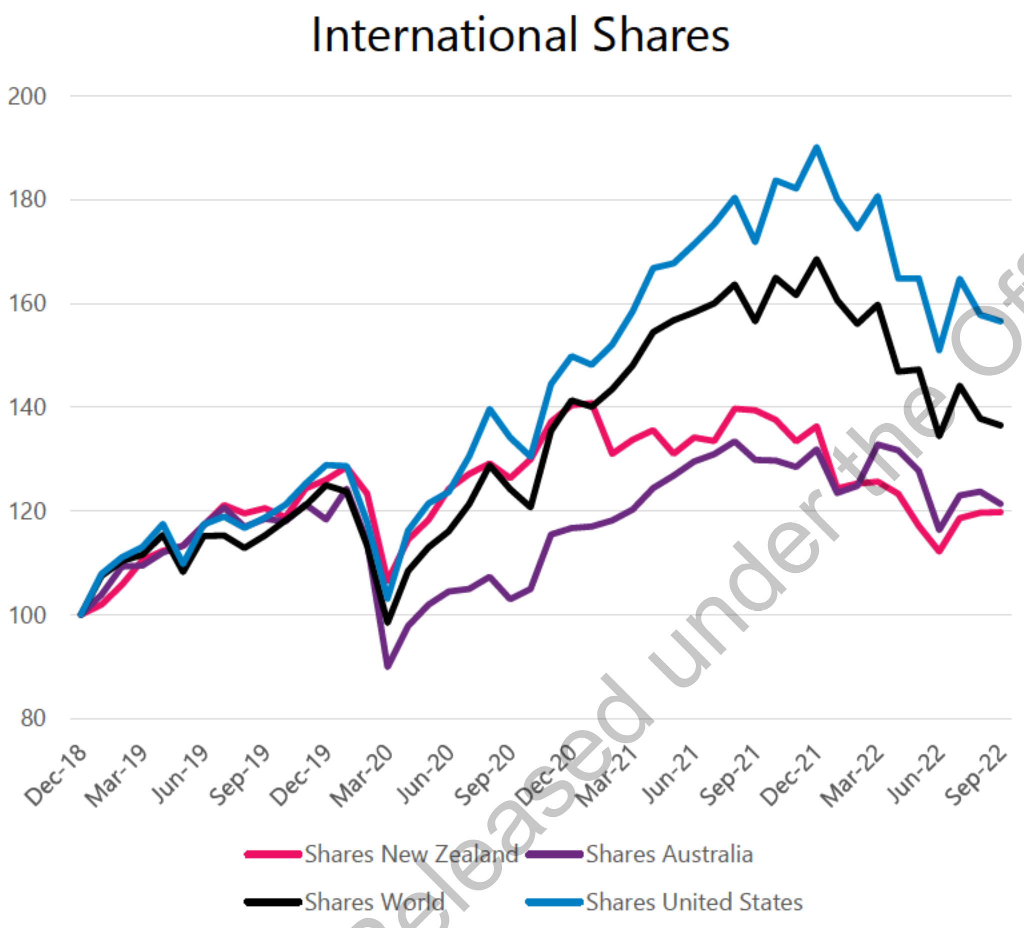


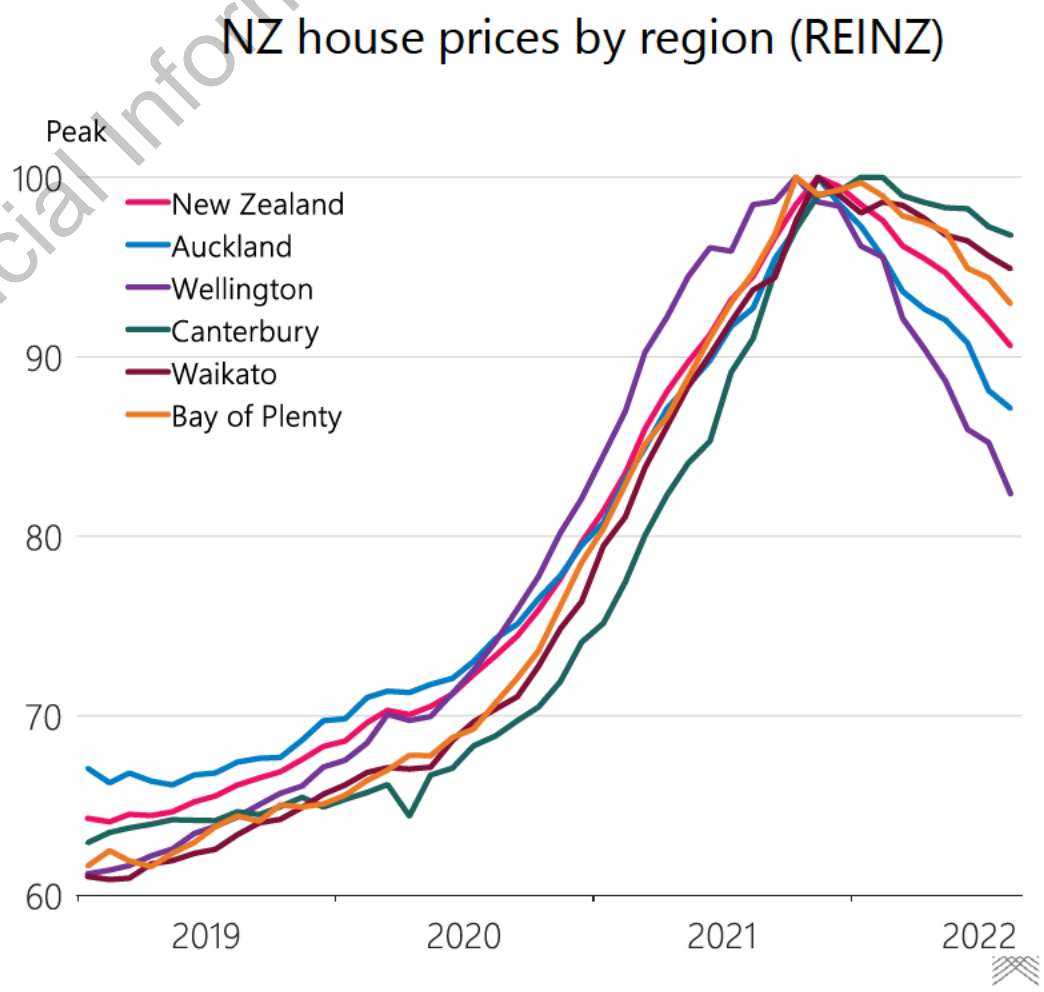
Government primary balance % of GDP



Source: OECD Outlook

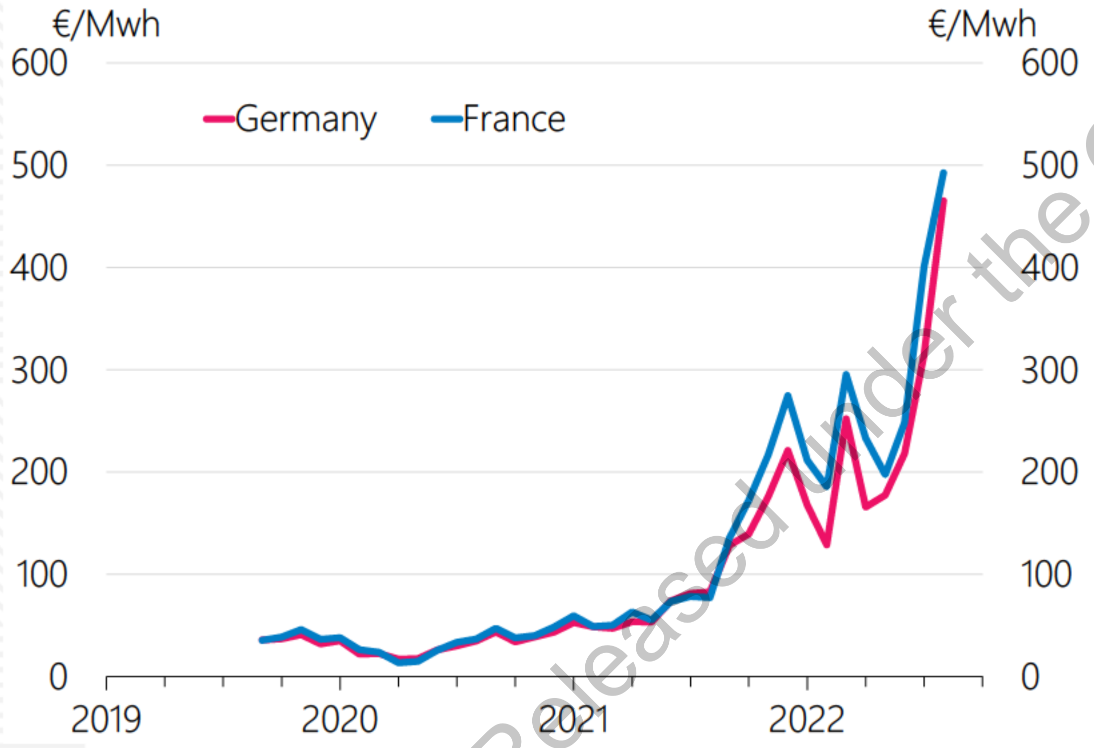
Asset prices are declining





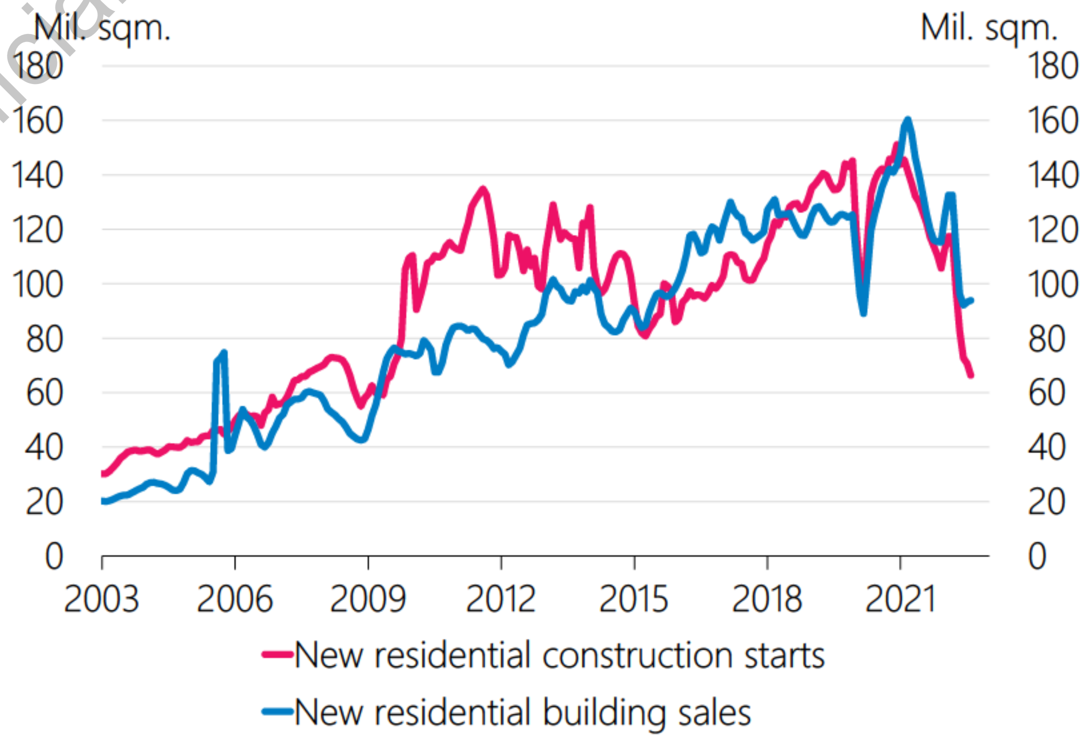
Global growth outlook weakening

Monthly average wholesale energy price (euros/megawatt hour)



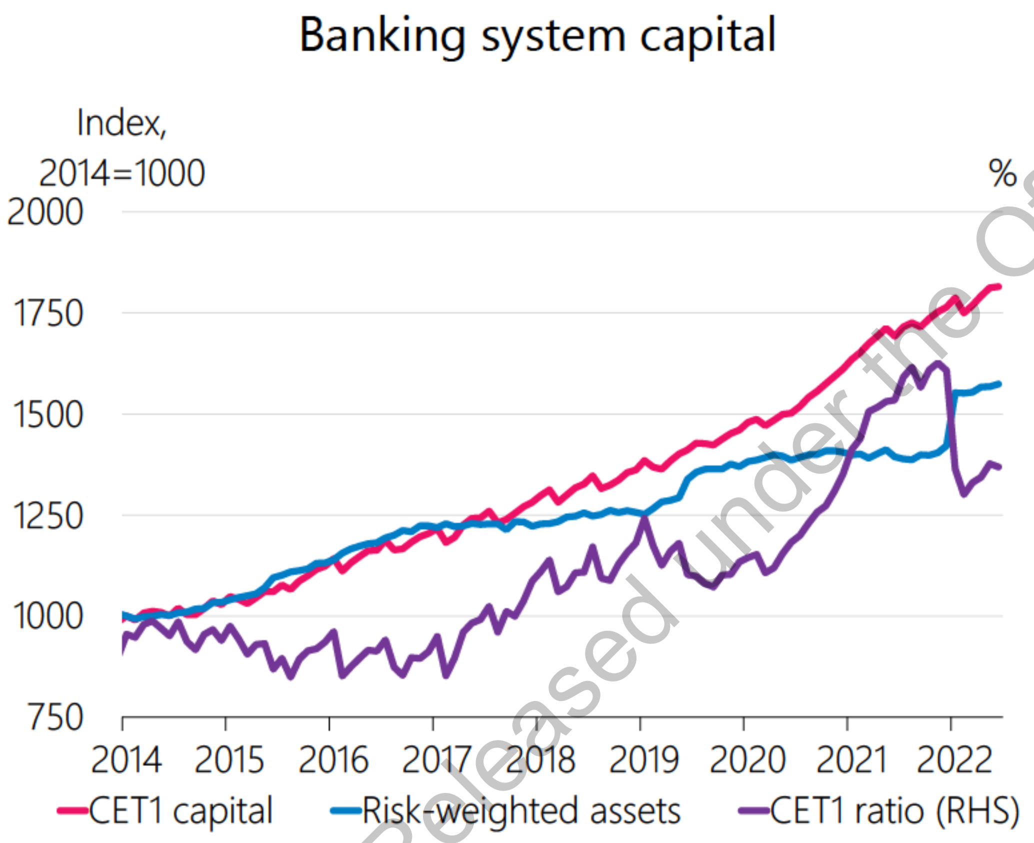
Source: Nord Pool

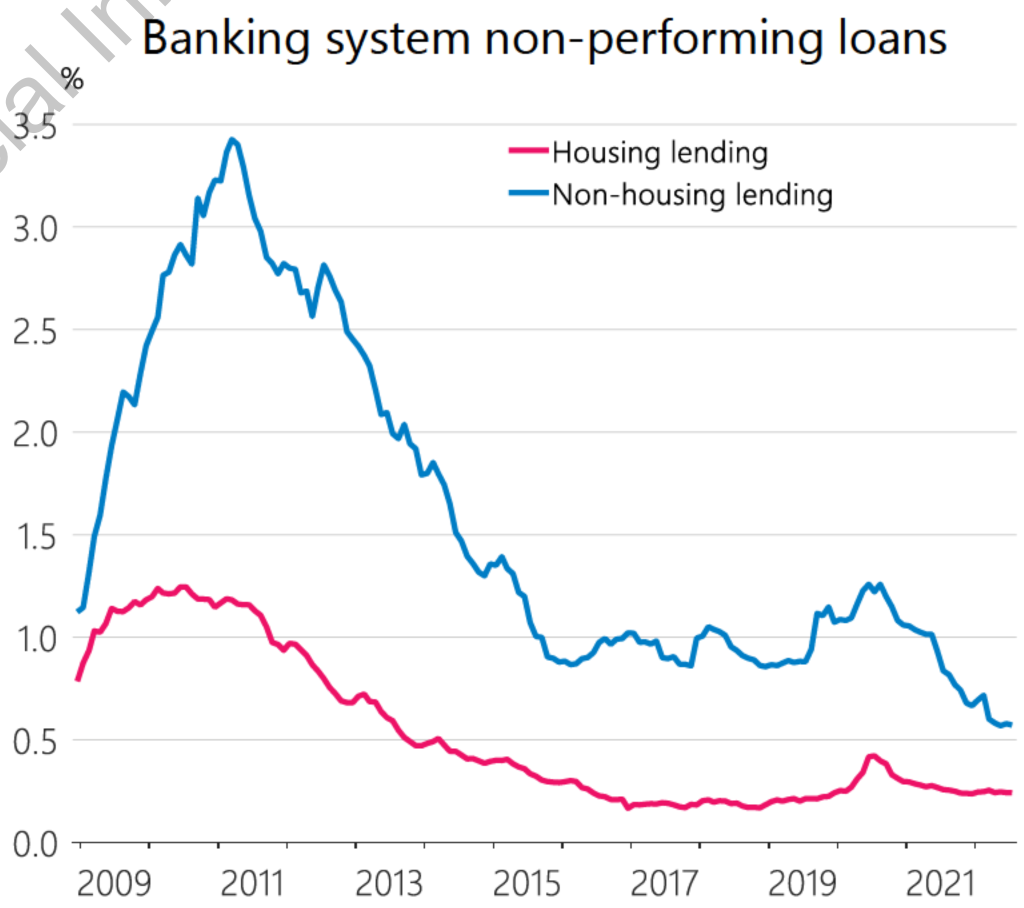
China: New residential real estate (seasonally adjusted, 3mma)



Source: CNBS/Haver

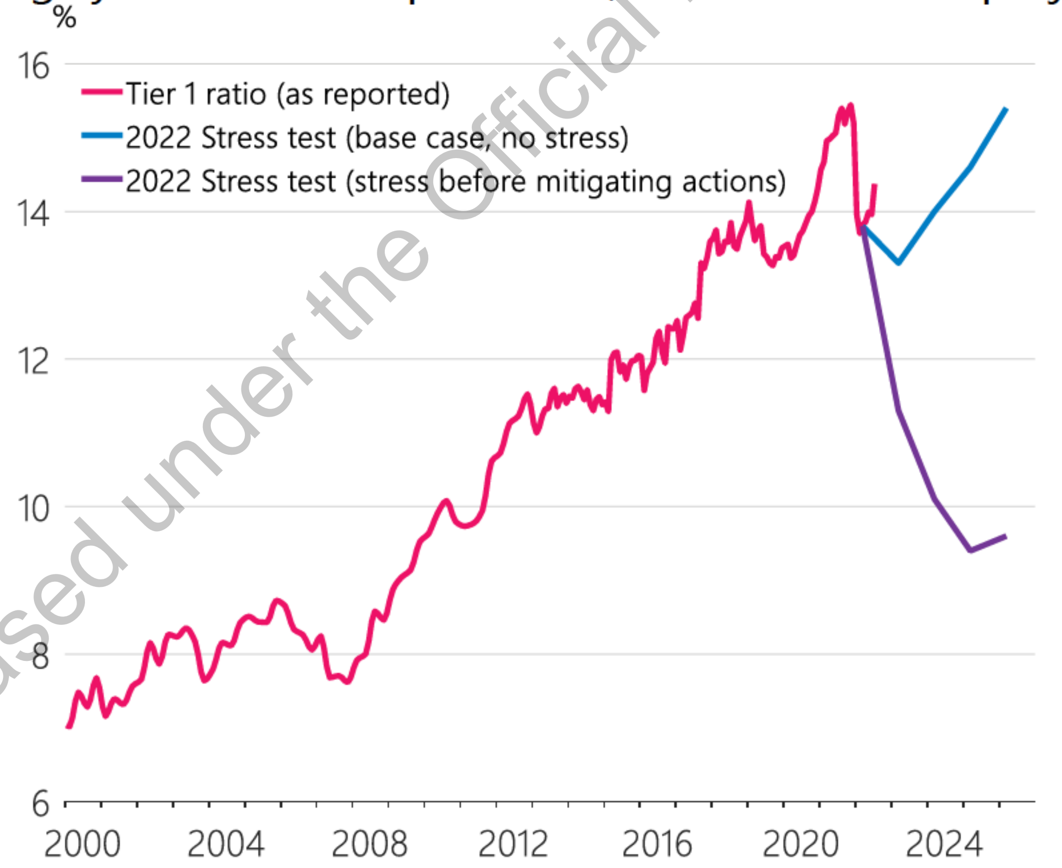
NZ banks are well positioned...





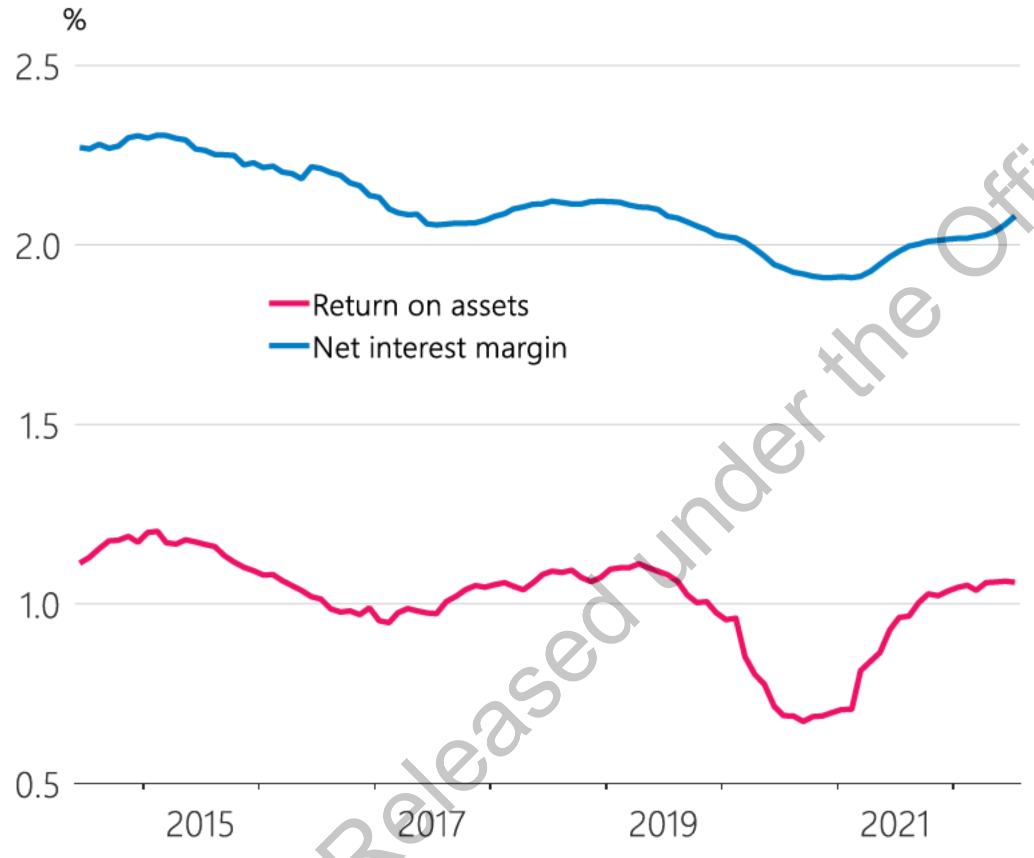
...maintaining higher capital ratios in stress than seen prior to the GFC...

Banking system Tier 1 capital ratio, 2022 Stress Test projections

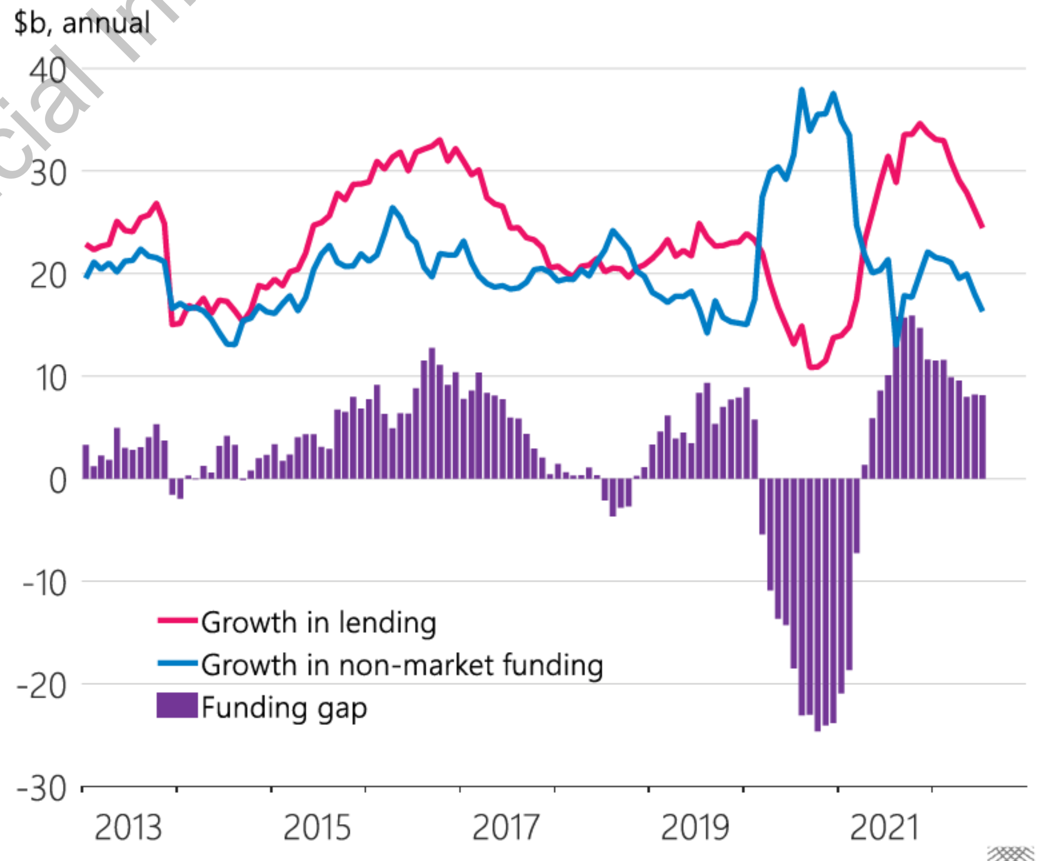


...with strong profitability and funding profiles, as support winds down

Bank profitability indicators



Bank funding needs



Sectoral views:

i. **Households**

ii. Residential construction

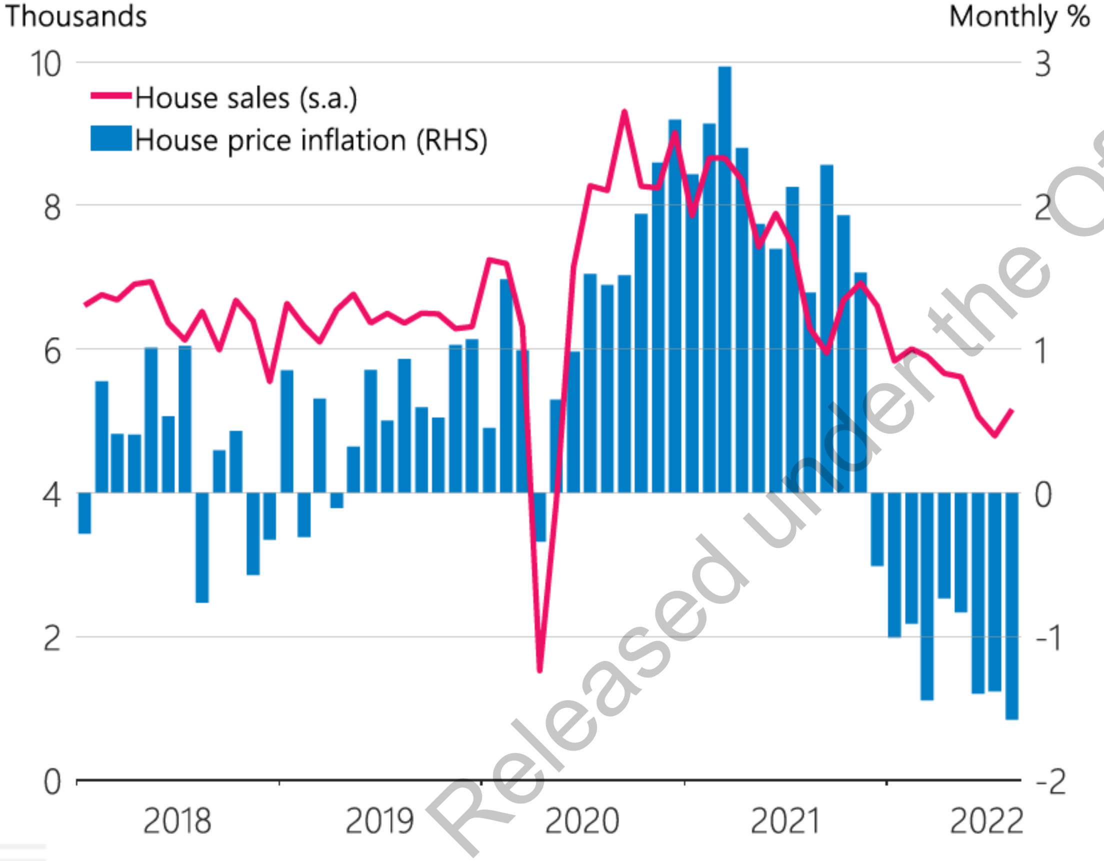
iii. Businesses and commercial property

Key points

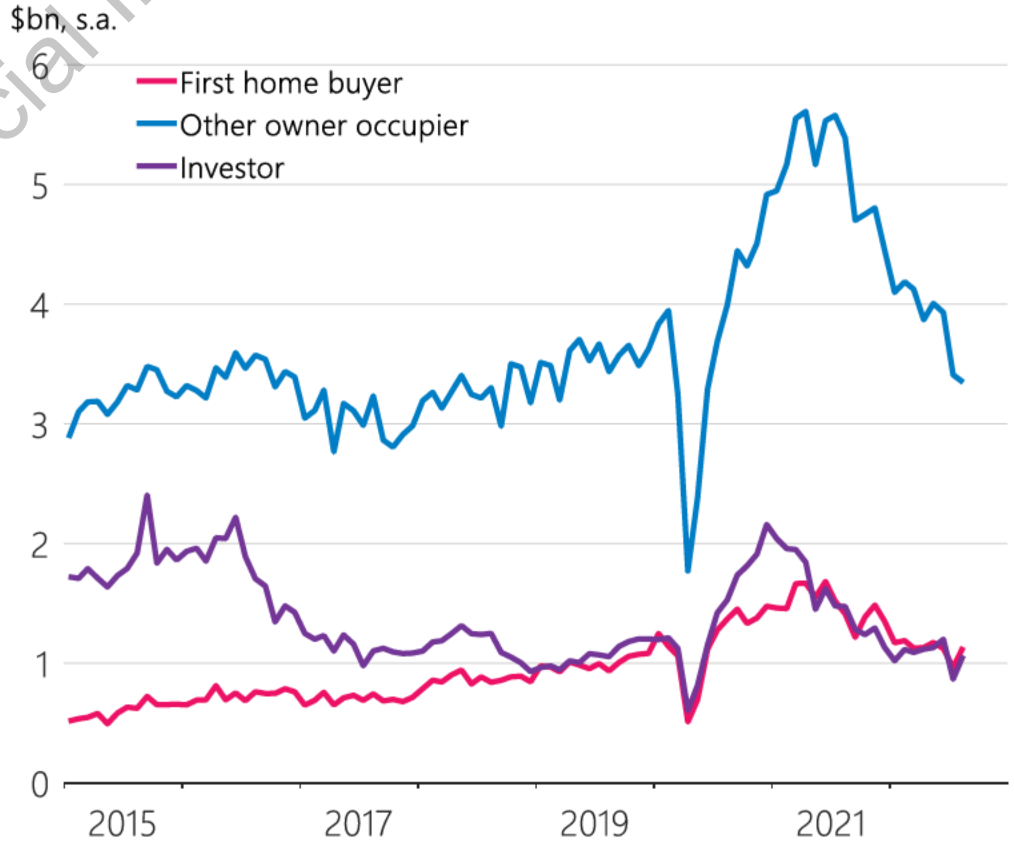
- Housing demand weakened by rising interest rates, LVRs and CCCFA. Prices continue to fall and market activity remains subdued.
- Risky household borrowing has fallen sharply, as affordability constraints and LVRs bind.
- Interest rates have risen, but not fully passed through to the stock of borrowers. Further increases in rates could see some borrowers in serviceability stress.
- Even if stresses are contained, spillovers from rising debt servicing costs and falling house prices will affect the real economy.

Housing market and lending growth are slowing

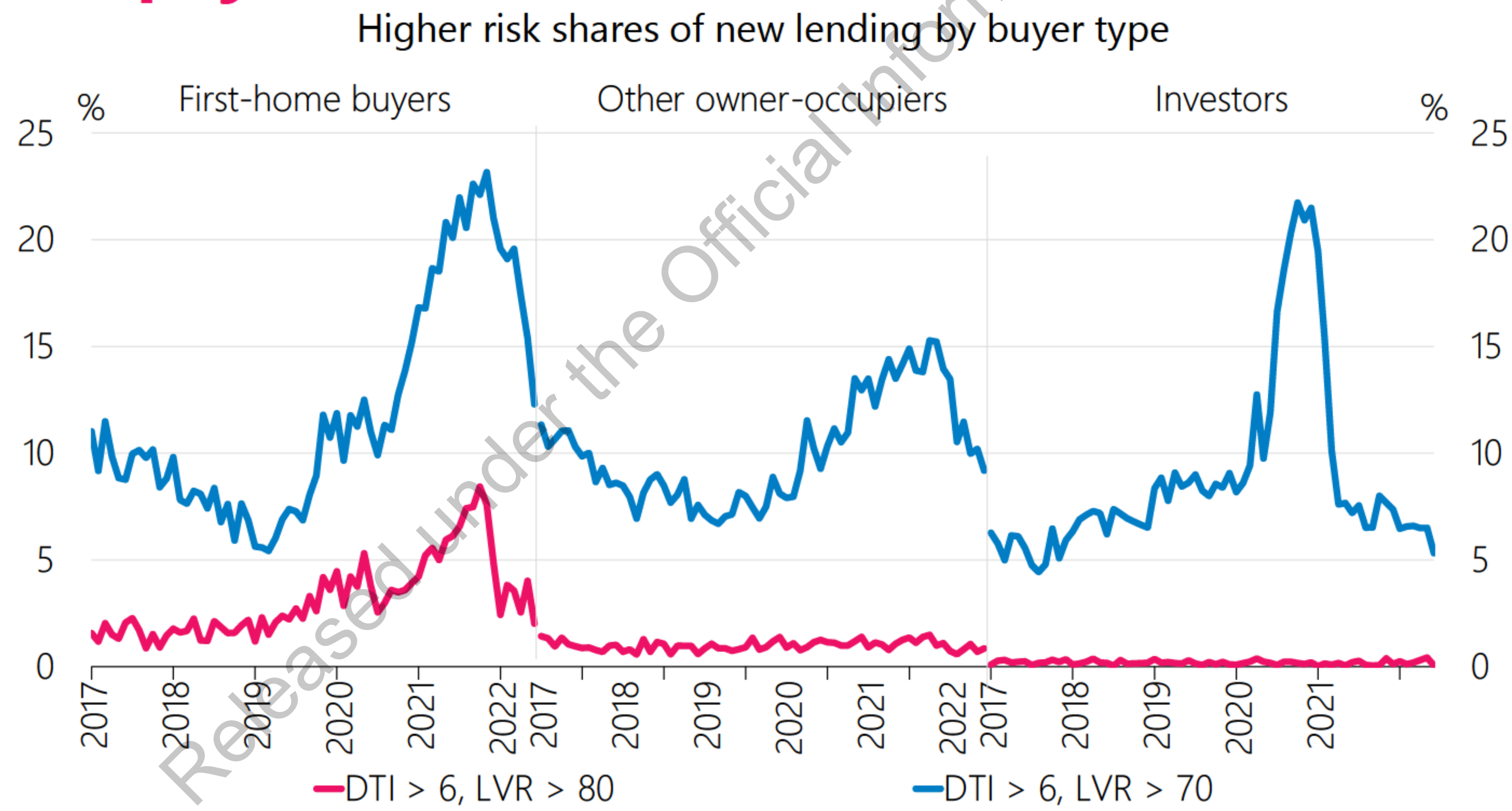
REINZ house prices and house sales



Value of new mortgage lending by buyer type

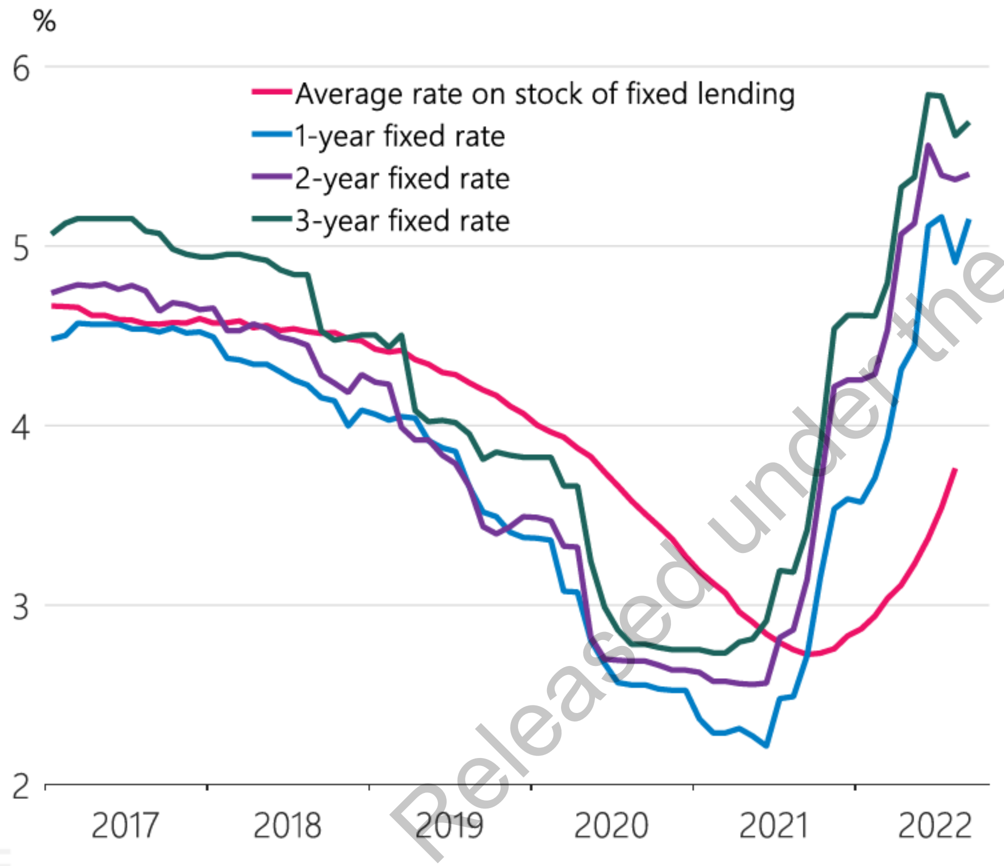


Higher risk lending has fallen sharply

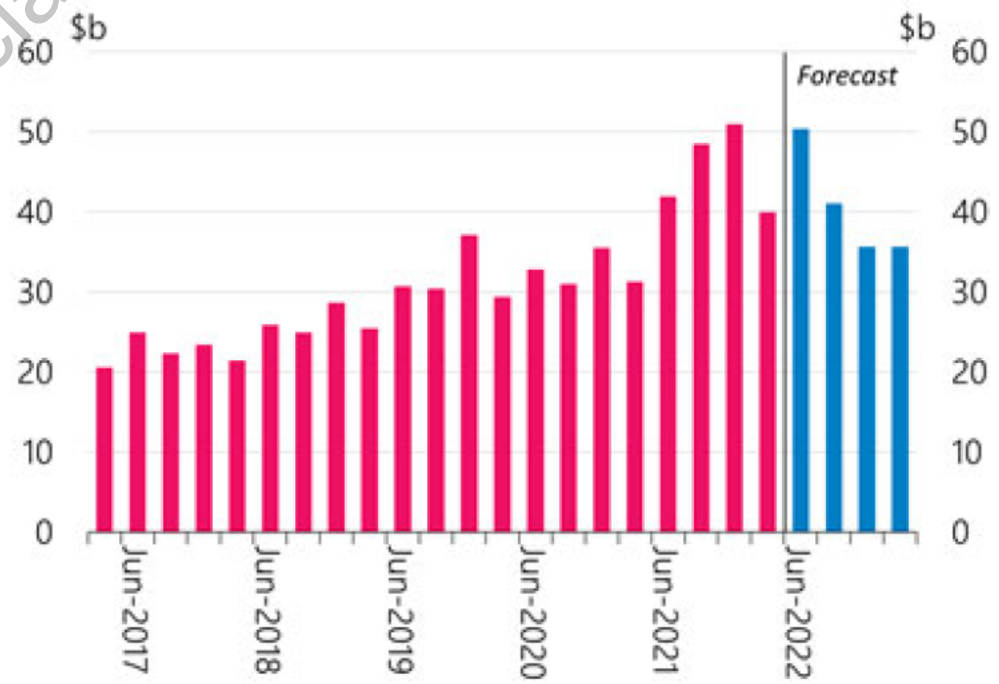


Mortgage rates have risen, and a large share of previous lending is set to reprice

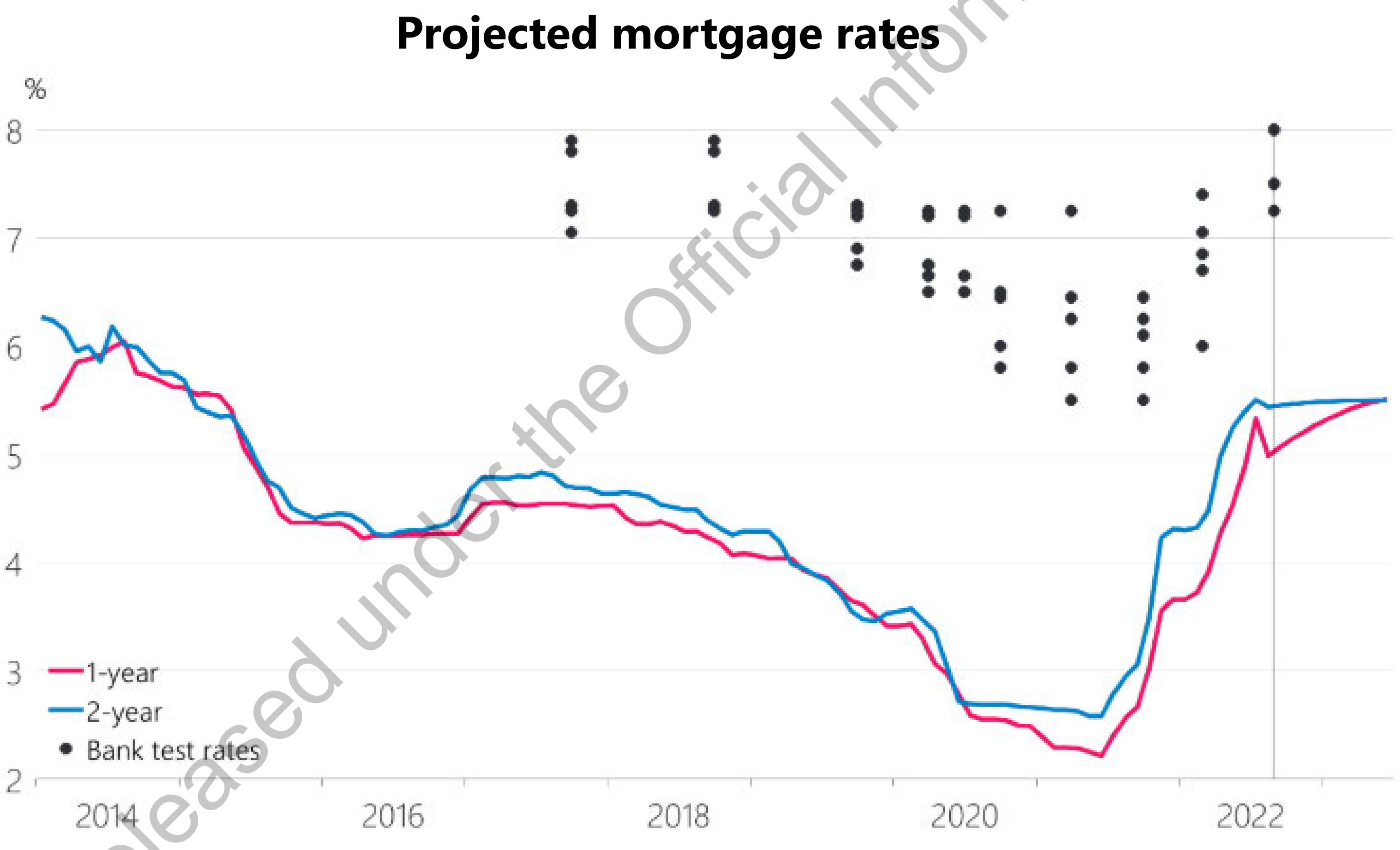
New fixed mortgage rates and average rate on existing fixed rate lending



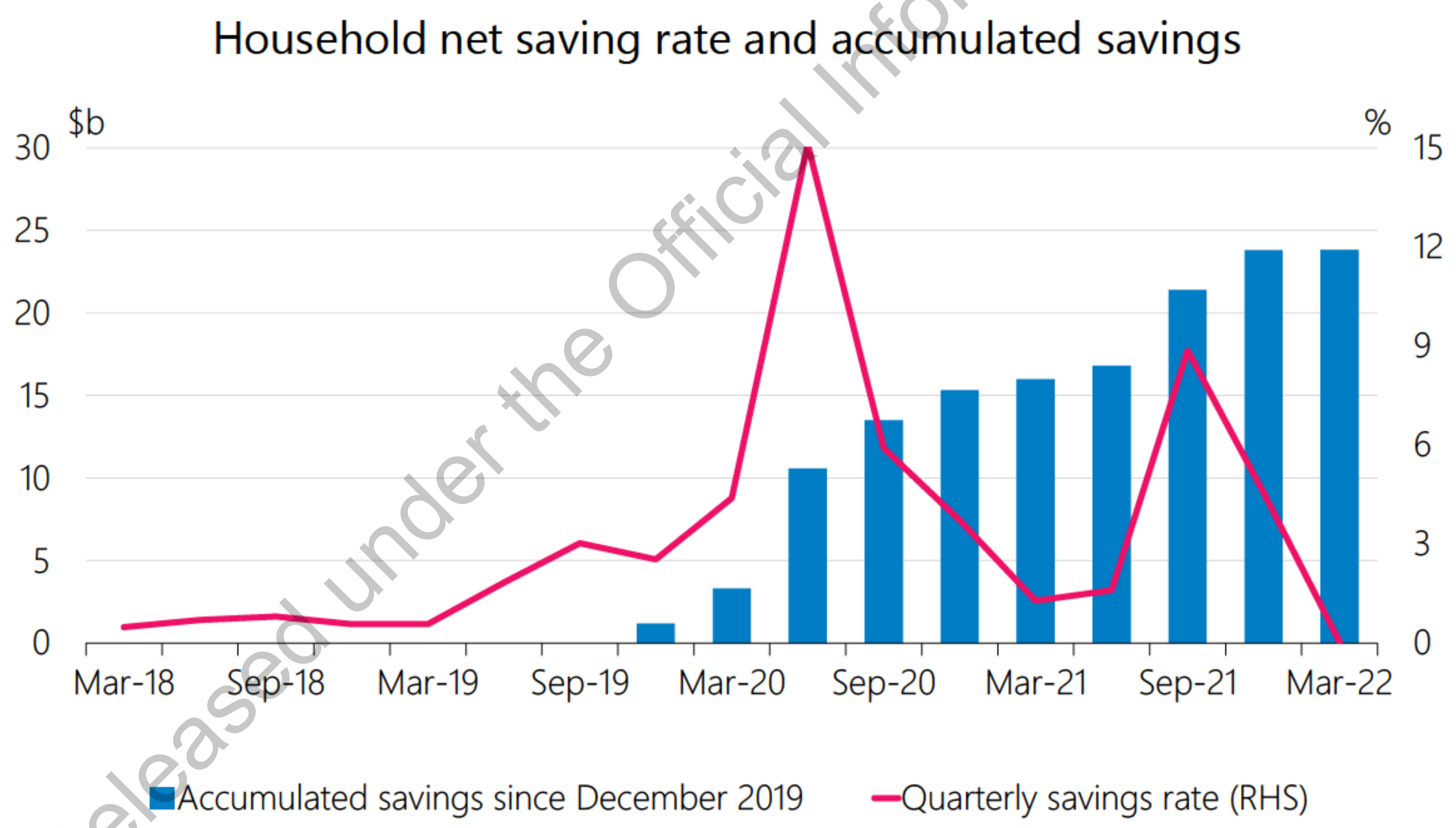
Volume of mortgage repricing over next 12 months



Rates may be near their peak

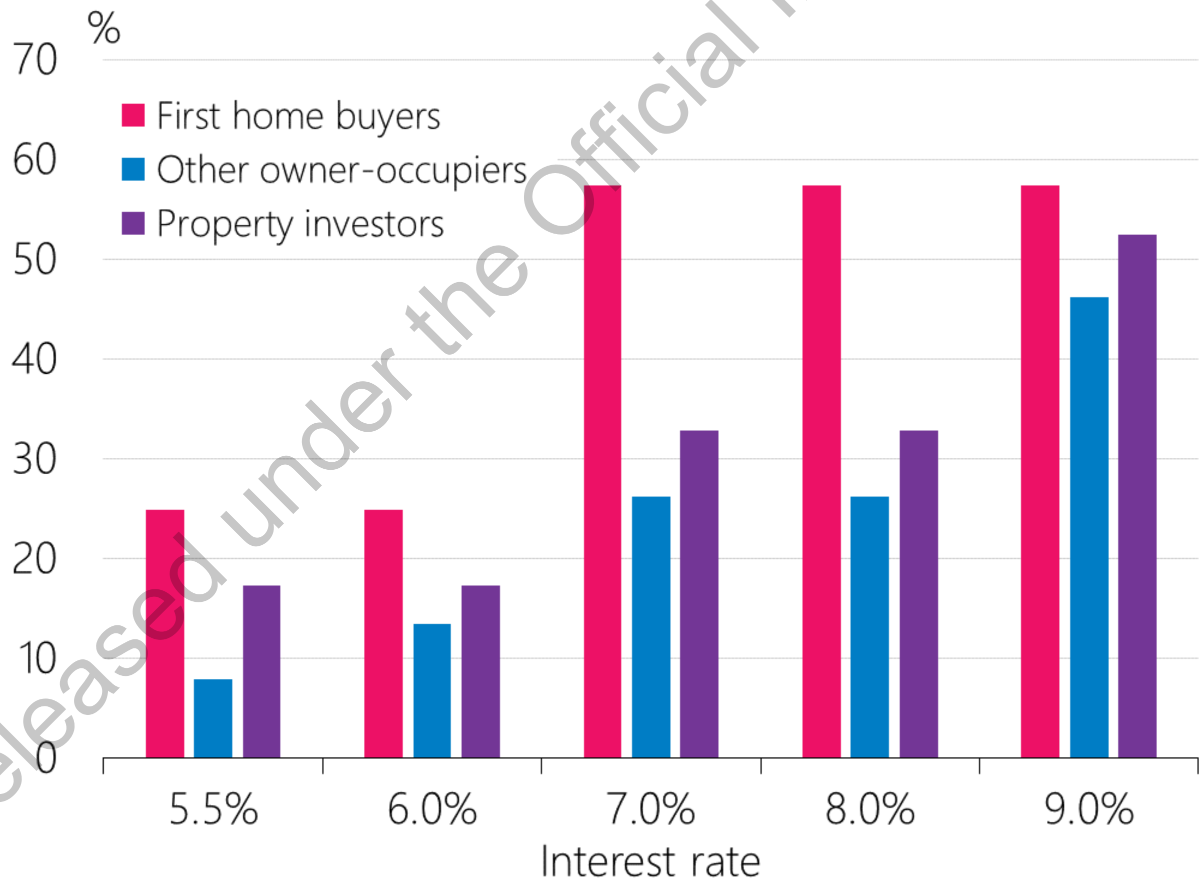


Household savings have levelled off

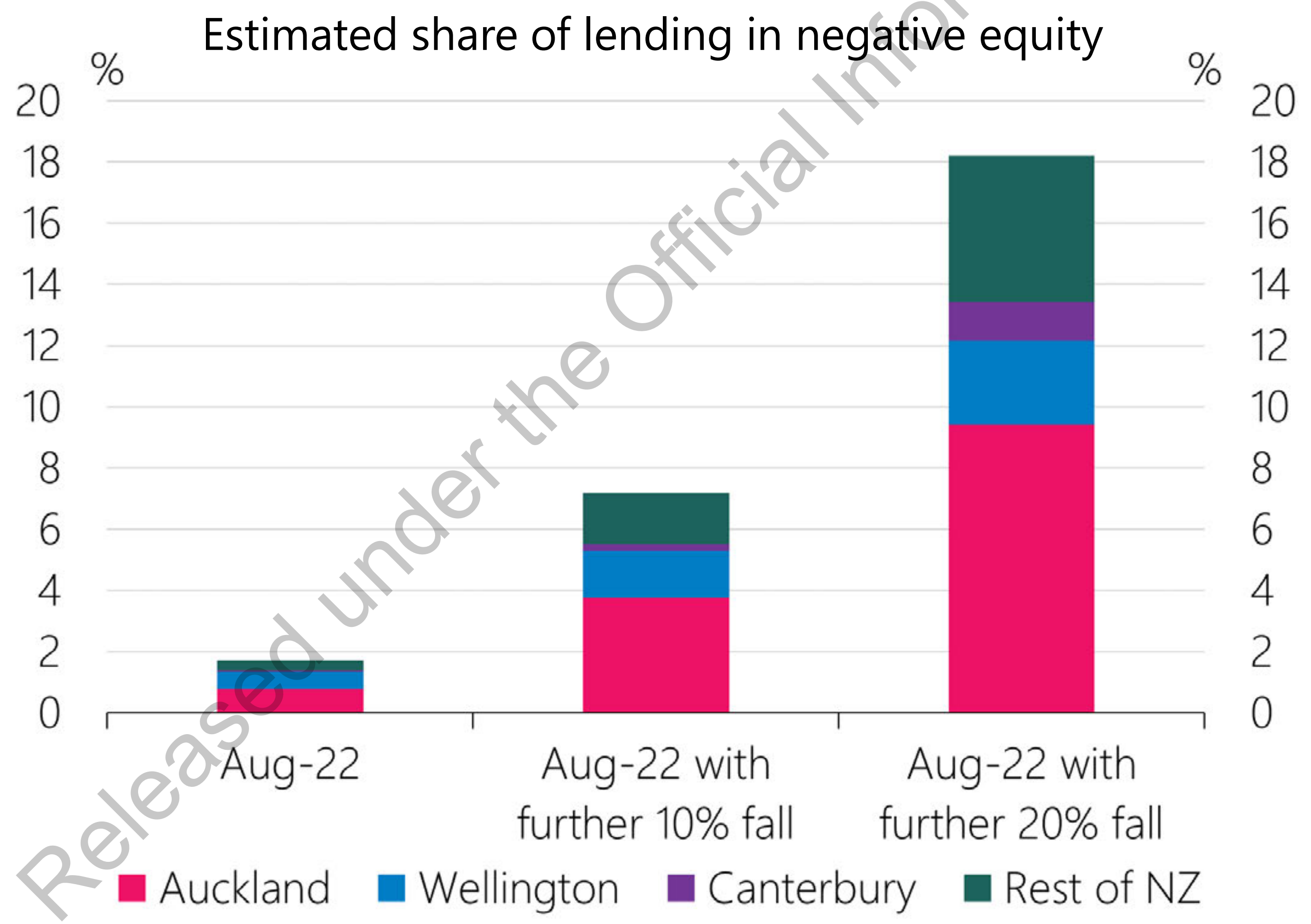


Increases in mortgage rates would see some recent buyers face serviceability stress

Estimated share of lending in the year to Dec 2021 that would face serviceability stress under different interest rates, by buyer type



Risk of borrowers going into negative equity



House prices have fallen, but so too has our assessment of the sustainable level

Table 1: Estimates of house price sustainability[1]

House Price over/under valuation	Valuation as at January 2022	Valuation as at June 2022
Investor asset pricing model (no leverage)	+10.5%	+7.2% (overvalued)
Owner-occupier valuation (user cost model)	+16.8%	+10.3%
Mortgage to Rent Ratio	+13.9%	+10.4%
Pre-tax rental yields on residential property	+29.8%	+25.8%
Average debt servicing for 2-year mortgage	+29.0%	+20.1%

Sectoral views:

i. Households

ii. Residential construction

iii. Businesses and commercial property

Residential development outlook has deteriorated

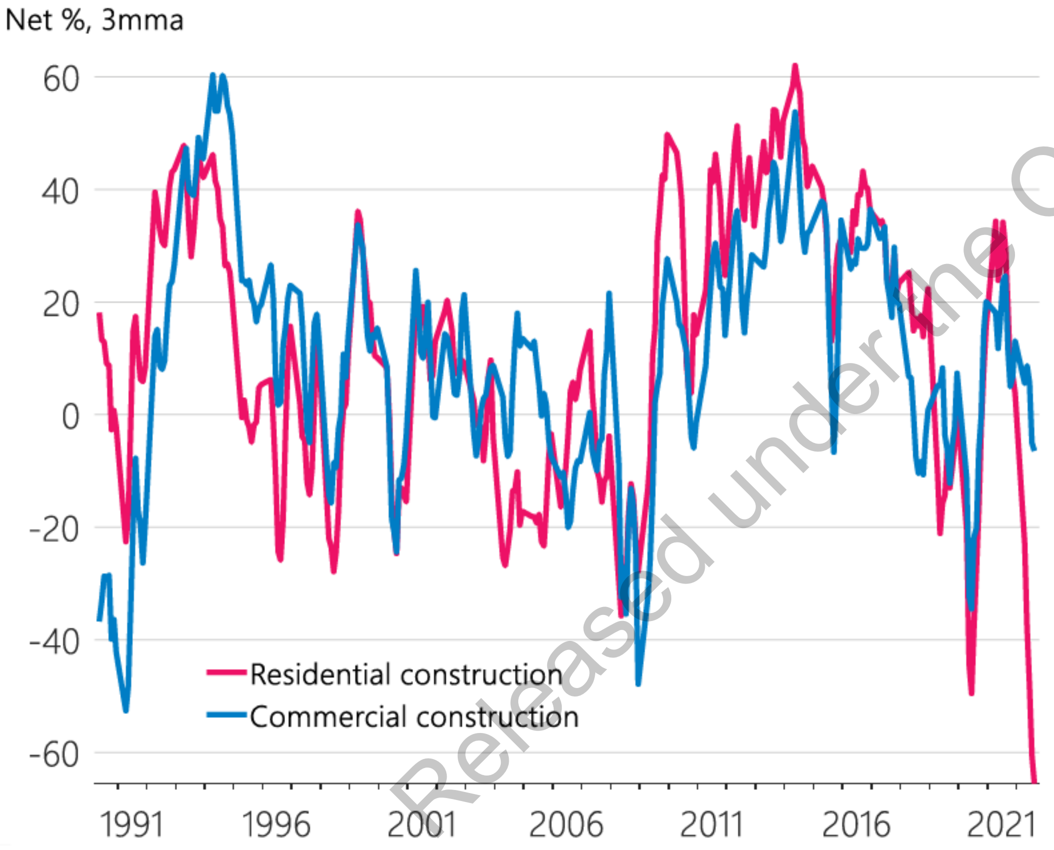
- Consistent message from bank liaison meetings that the market for residential presales has slowed dramatically (down ~80% overall).
- Potential new build buyers are stepping away from the market, making it very difficult for developers to meet qualifying presale conditions for bank finance.
- Drop in presales is in line with the broader housing market downturn. Buyers see prices falling in 12 months time and hence no urgency to buy off plan.
- Existing or turnkey property offers better value, due to more favourable current market conditions (number of listings etc.), and less uncertainty about effect of rising interest rates/reduced borrowing capacity/construction cost inflation/risk of developer failing.

Development expected to slow

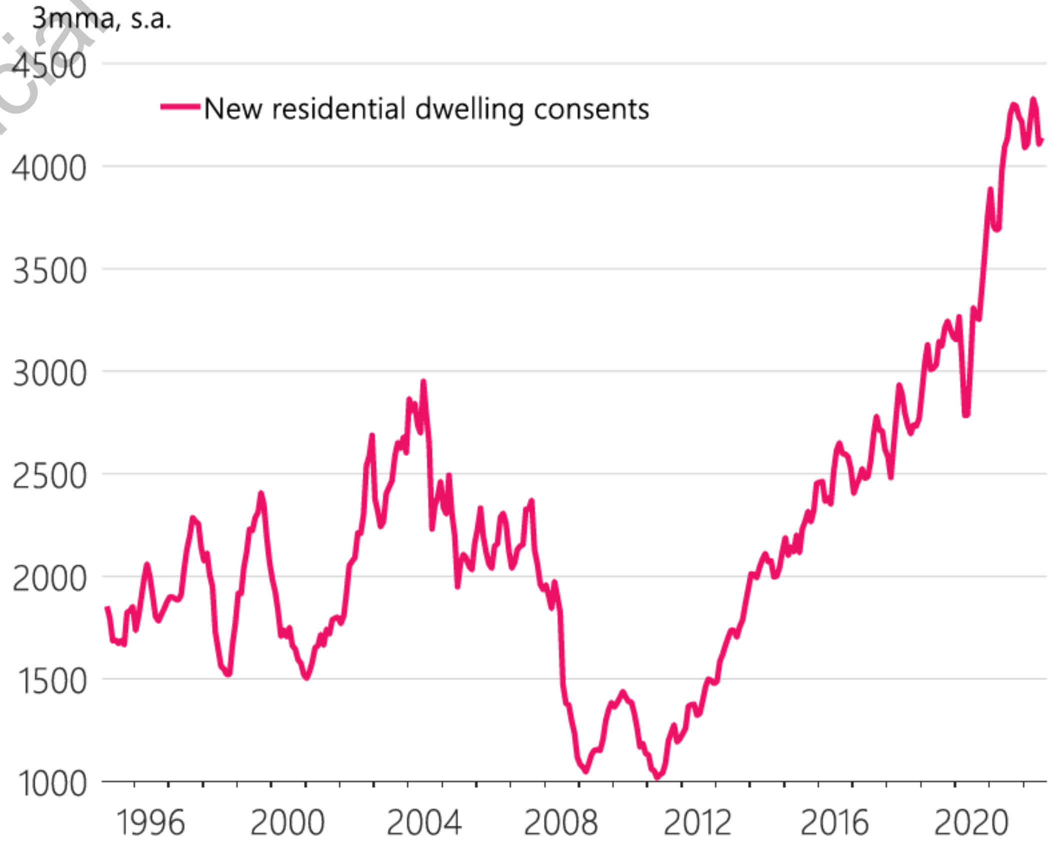
- Developer margins have fallen sharply from around 30% to 10%. Developers are being squeezed by high and uncertain costs and falling selling prices. Fixed price construction is no longer an option.
- Banks reflect construction cost uncertainty in the amount they are willing to lend to end buyers (~15% contingency), reducing effective borrowing capacity.
- Banks have had conservative risk settings for several years, but haven't tightened their development lending criteria recently. Instead, the number of economically viable new development projects has declined.
- Some developers who bought at the peak of land prices are looking to on-sell land where feasible, or wait for a pickup in presales.
- Banks are working with developers at a later stage of development to complete work. This pipeline looks to be ending in around 6-12 months.

Surveyed outlook is pessimistic, but consents still running high

Residential and commercial construction outlook, ANZBO



New residential dwelling consents



Sectoral views:

i. Households

ii. Residential construction

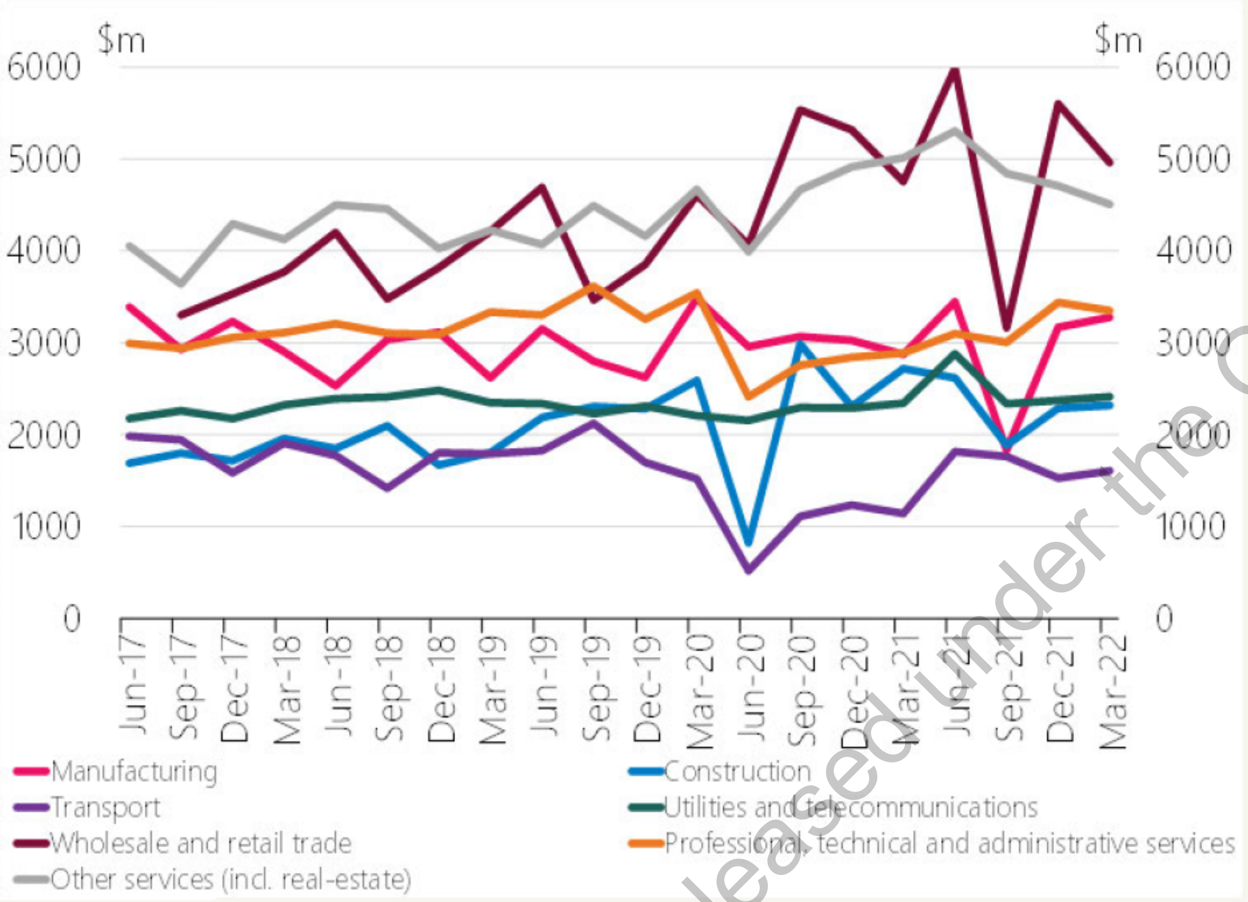
iii. Businesses and commercial property

Key points

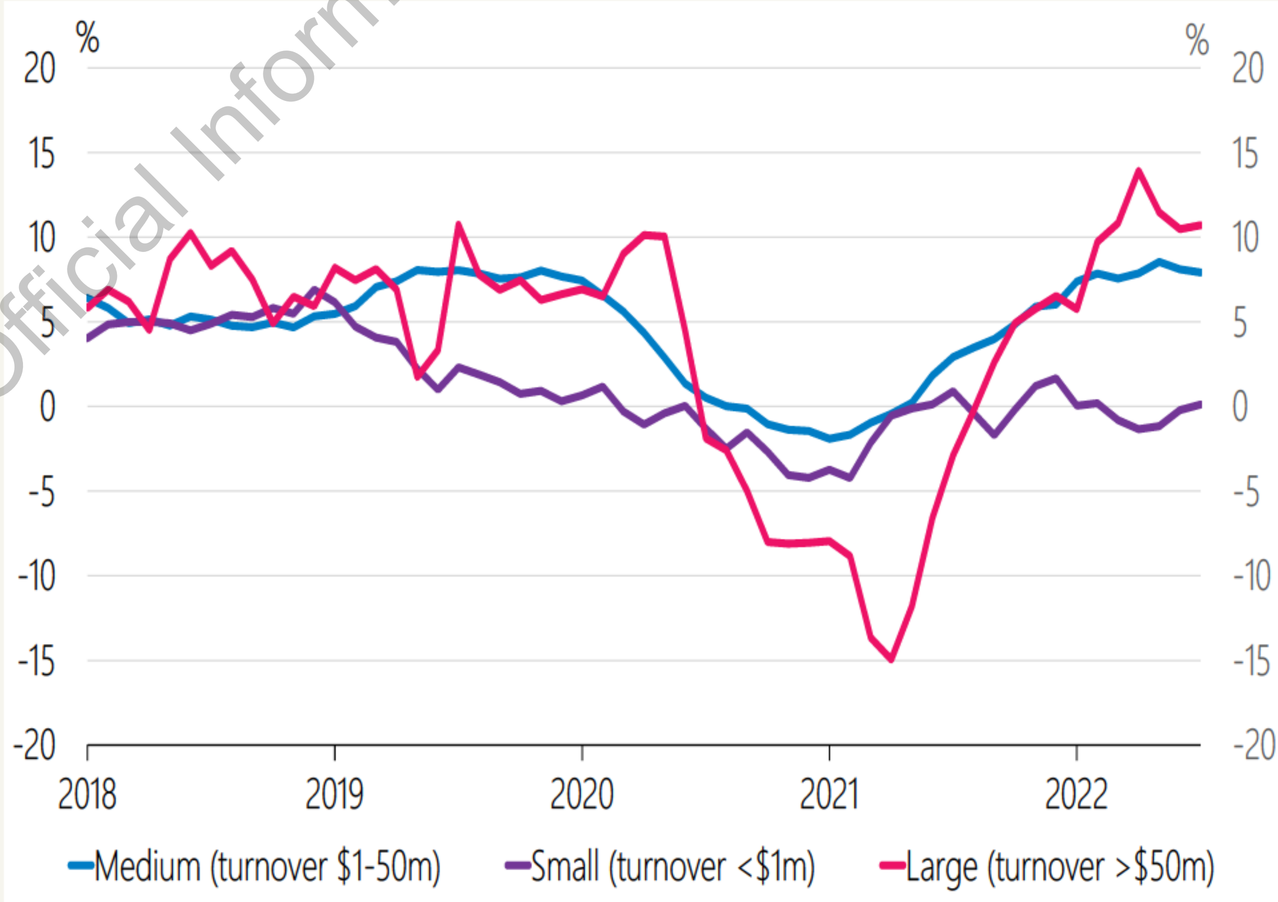
- Businesses face a challenging operating environment, including high inflation, a tight labour market, and lingering supply chain issues.
- Profitability has remained robust as firms have passed on cost increases, although this is becoming more difficult in some sectors. Falling consumer spending may also affect firm viability in some industries.

Businesses currently face solid demand...

Quarterly operating profits by sector

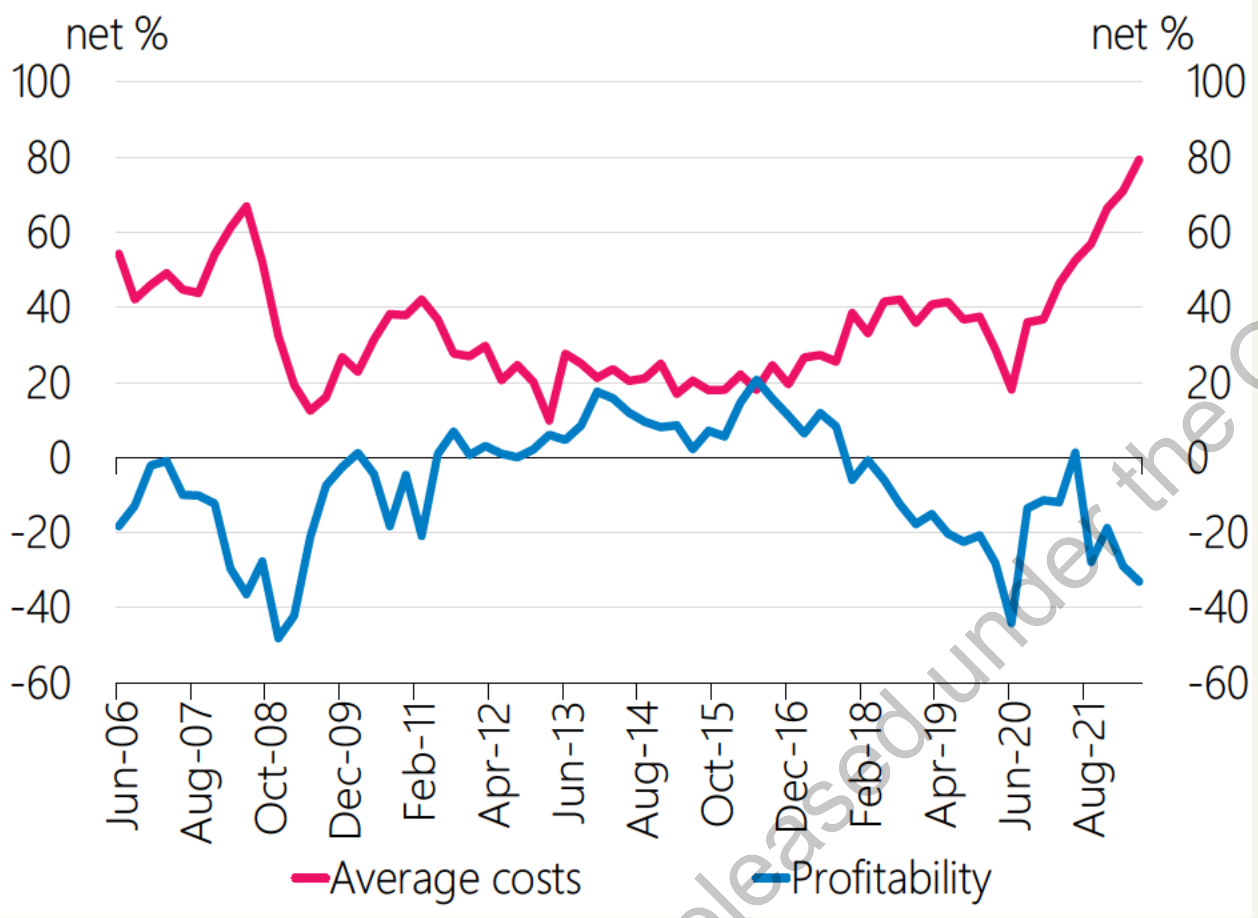


Business lending growth by firm size

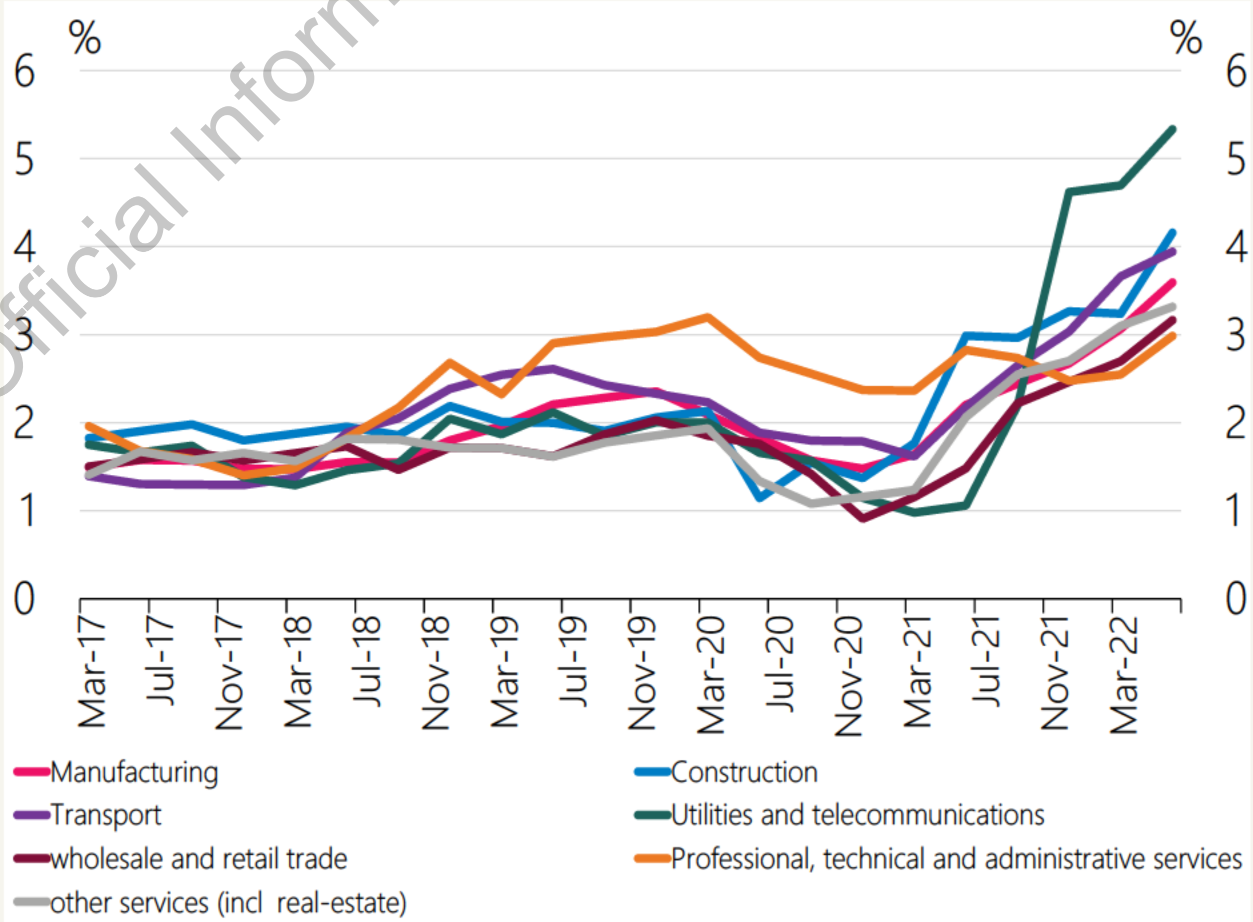


…but cost pressures are squeezing incomes…

QSBO expected costs and profitability

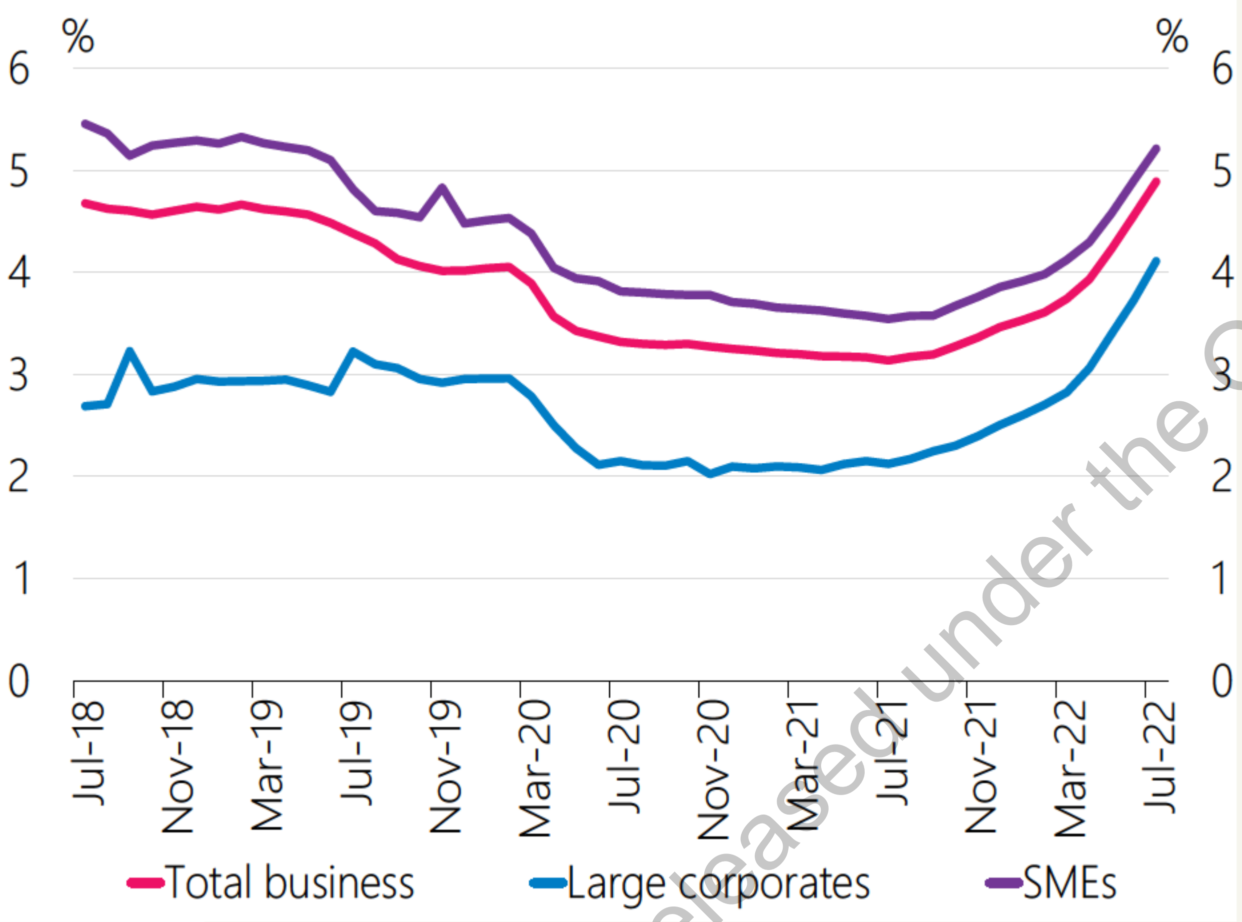


Labour cost index annual % change

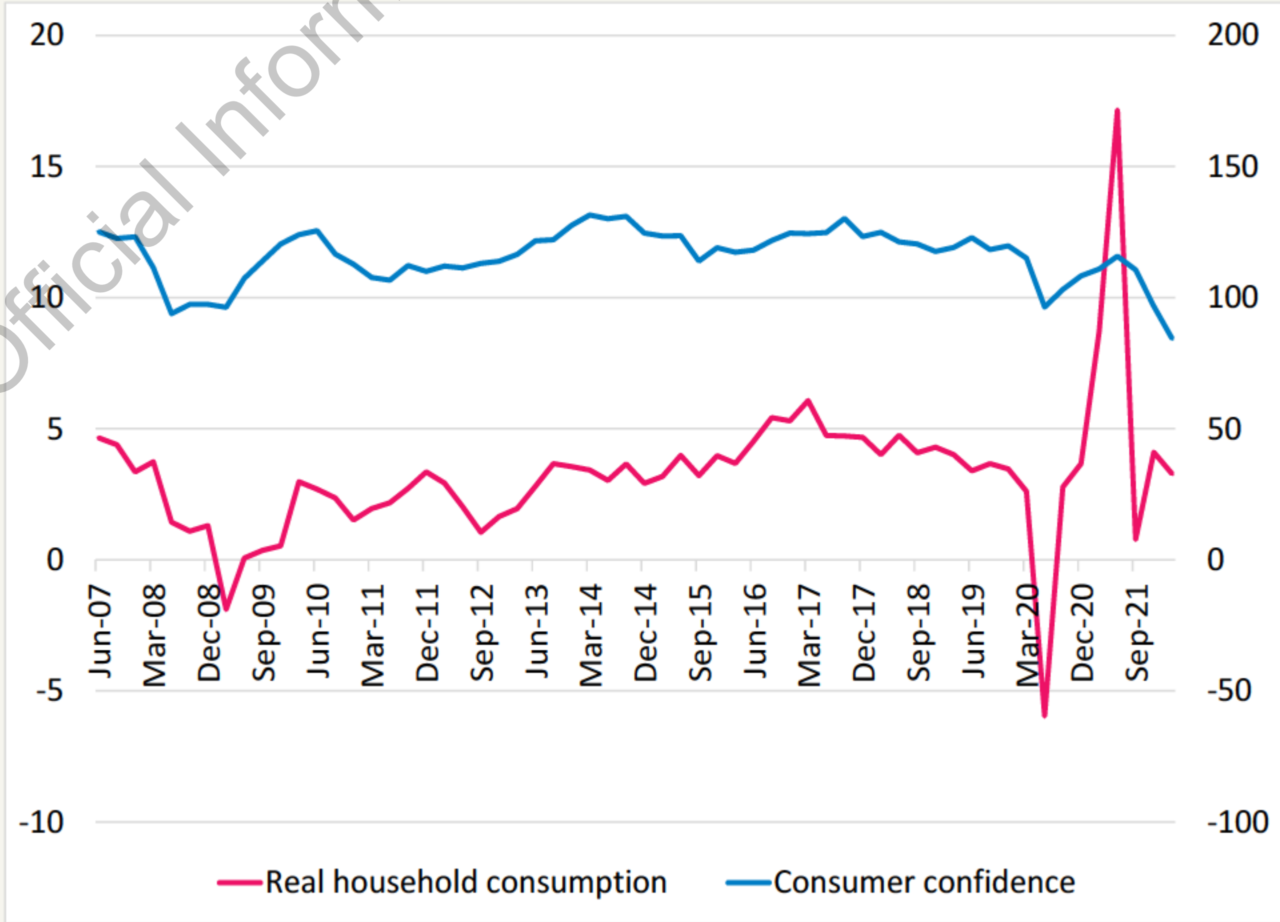


…amid higher interest rates & macro uncertainty

Bank yields on business lending



Consumer confidence and spending



IN-CONFIDENCE

Key points

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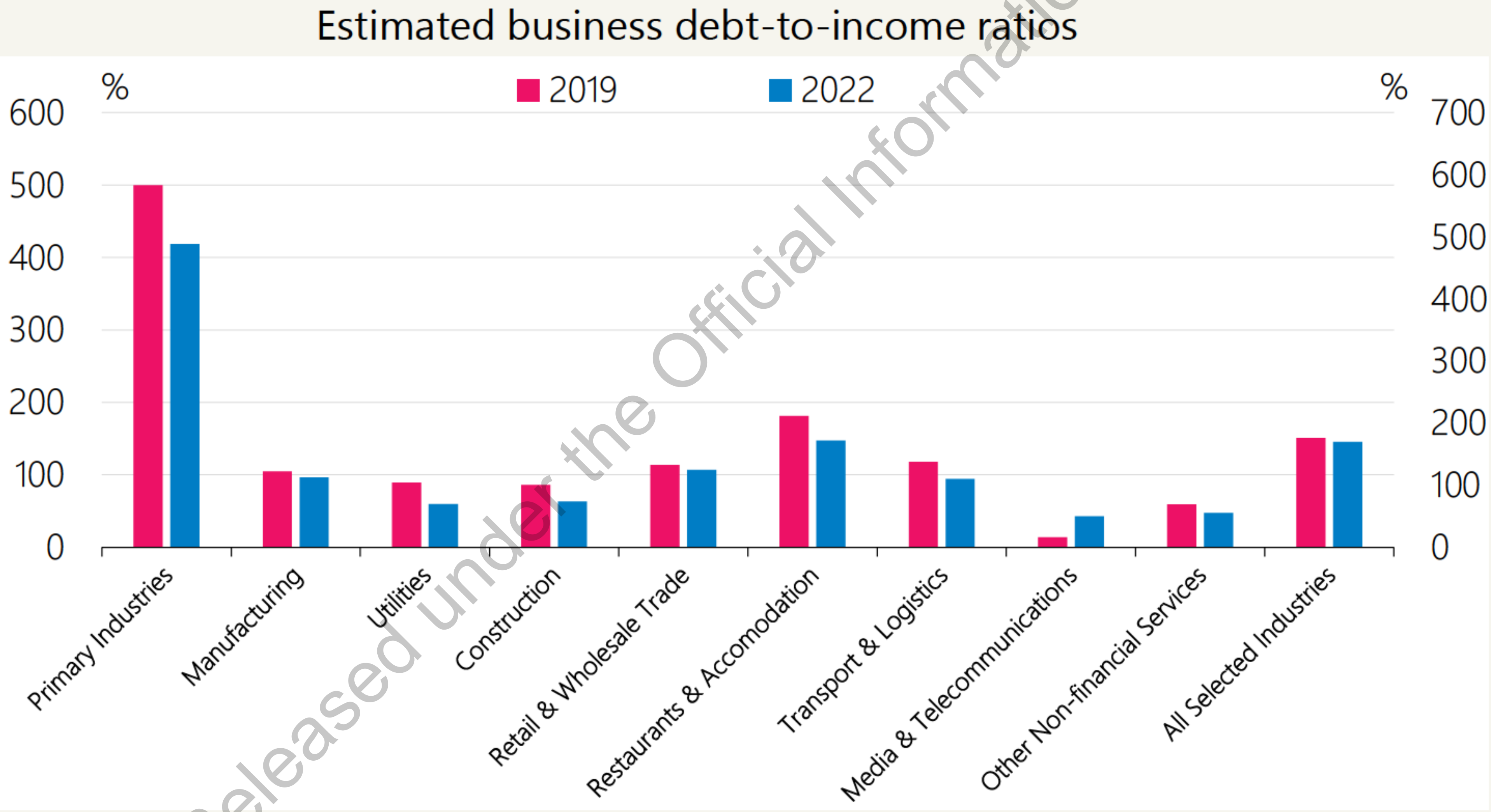
- Profitability has remained robust as firms have passed on cost increases, although this is becoming more difficult in some sectors. Falling consumer spending may also affect firm viability in some industries.
- An improvement in business balance sheets in recent years leaves them well placed to handle higher interest rates. To date, bank lending data shows no signs of emerging credit stresses.

Business balance sheets improved since 2019

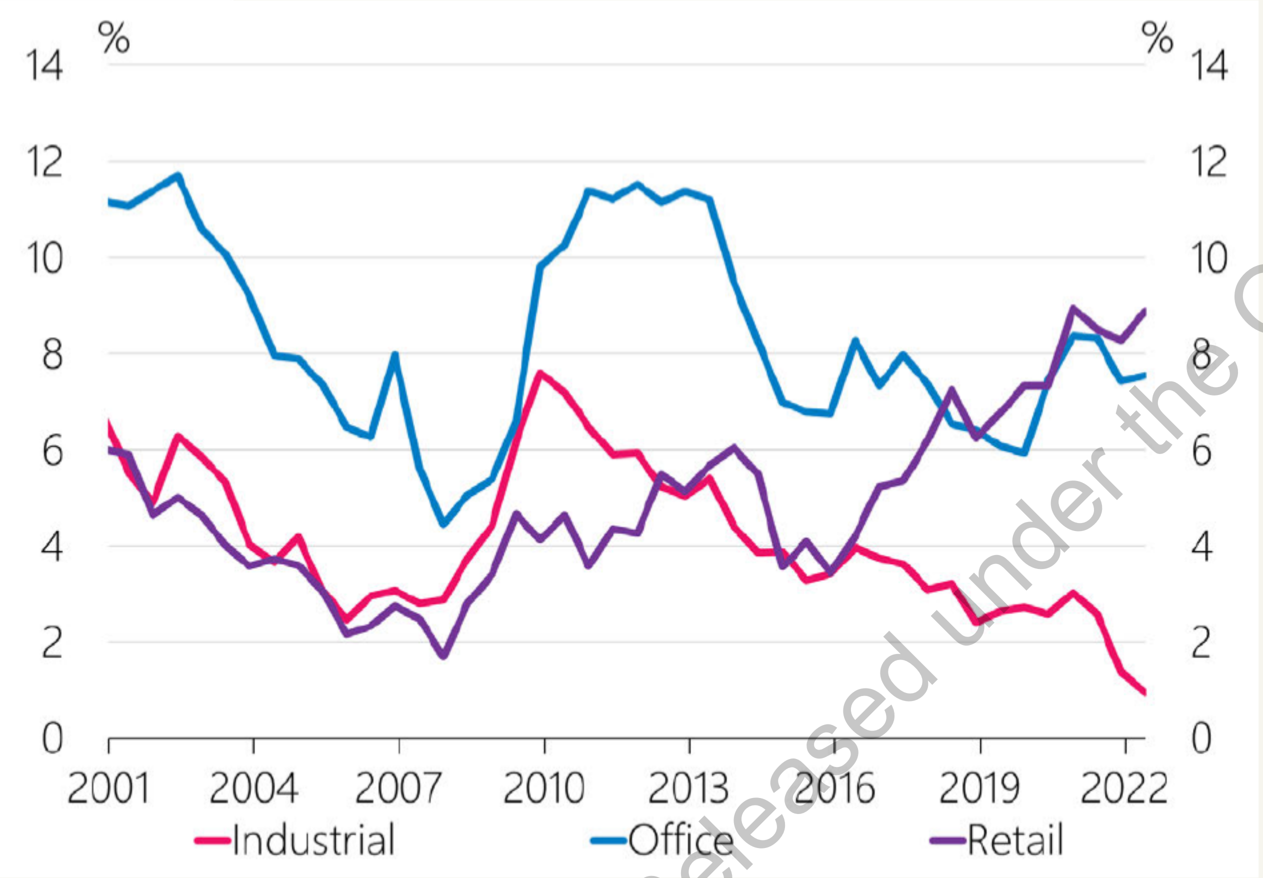


Key points

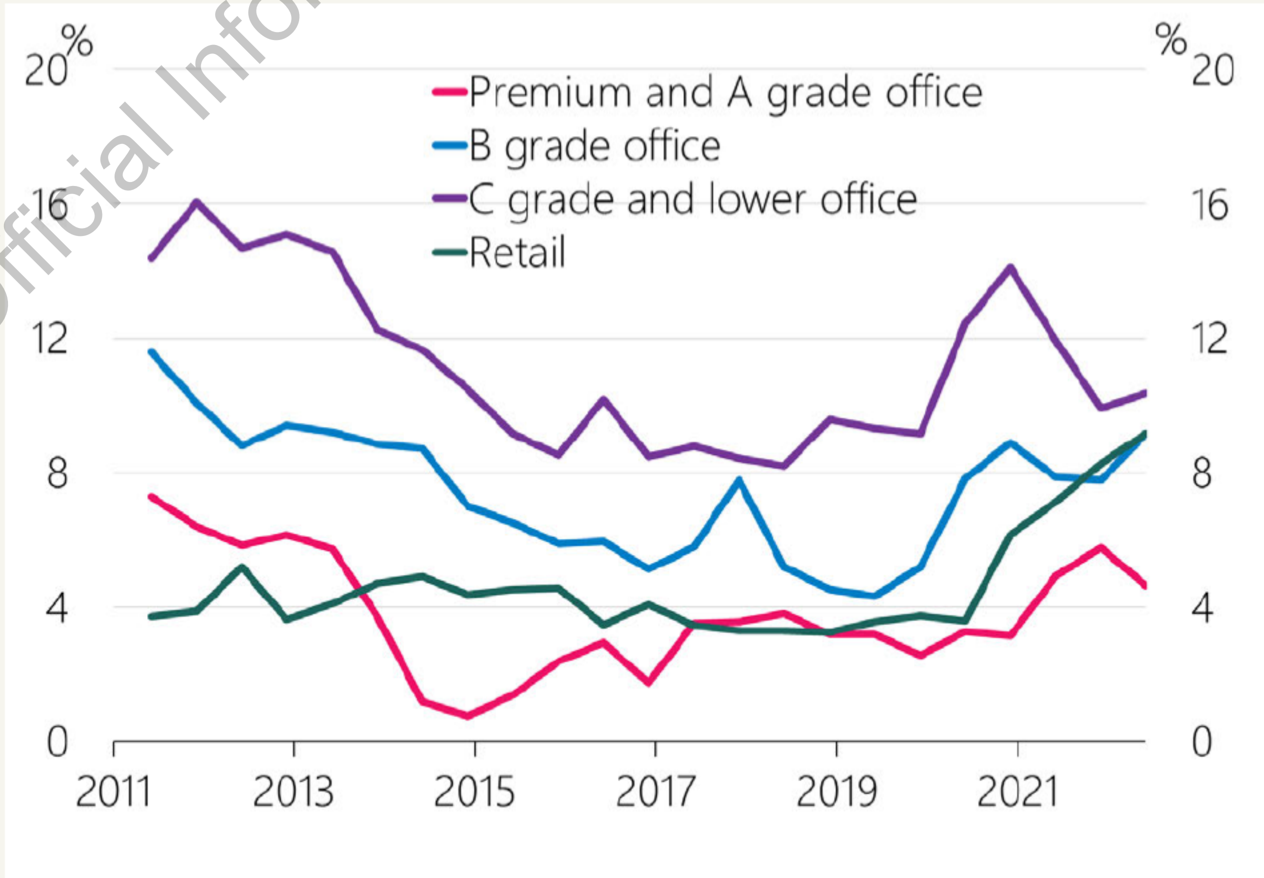
- Businesses face a challenging operating environment, including high inflation, a tight labour market, and lingering supply chain issues.
- Profitability has remained robust as firms have passed on cost increases, although this is becoming more difficult in some sectors. Falling consumer spending may also affect firm viability in some industries.
- An improvement in business balance sheets in recent years leaves them well placed to handle higher interest rates. To date, bank lending data shows no signs of emerging credit stresses.
- Commercial property remains a sector at risk as COVID-related trends reduce tenant demand for retail and office sites, although this will take time to eventuate.

Commercial property mixed – lower quality retail and offices more at risk

CRE vacancy rates by sector

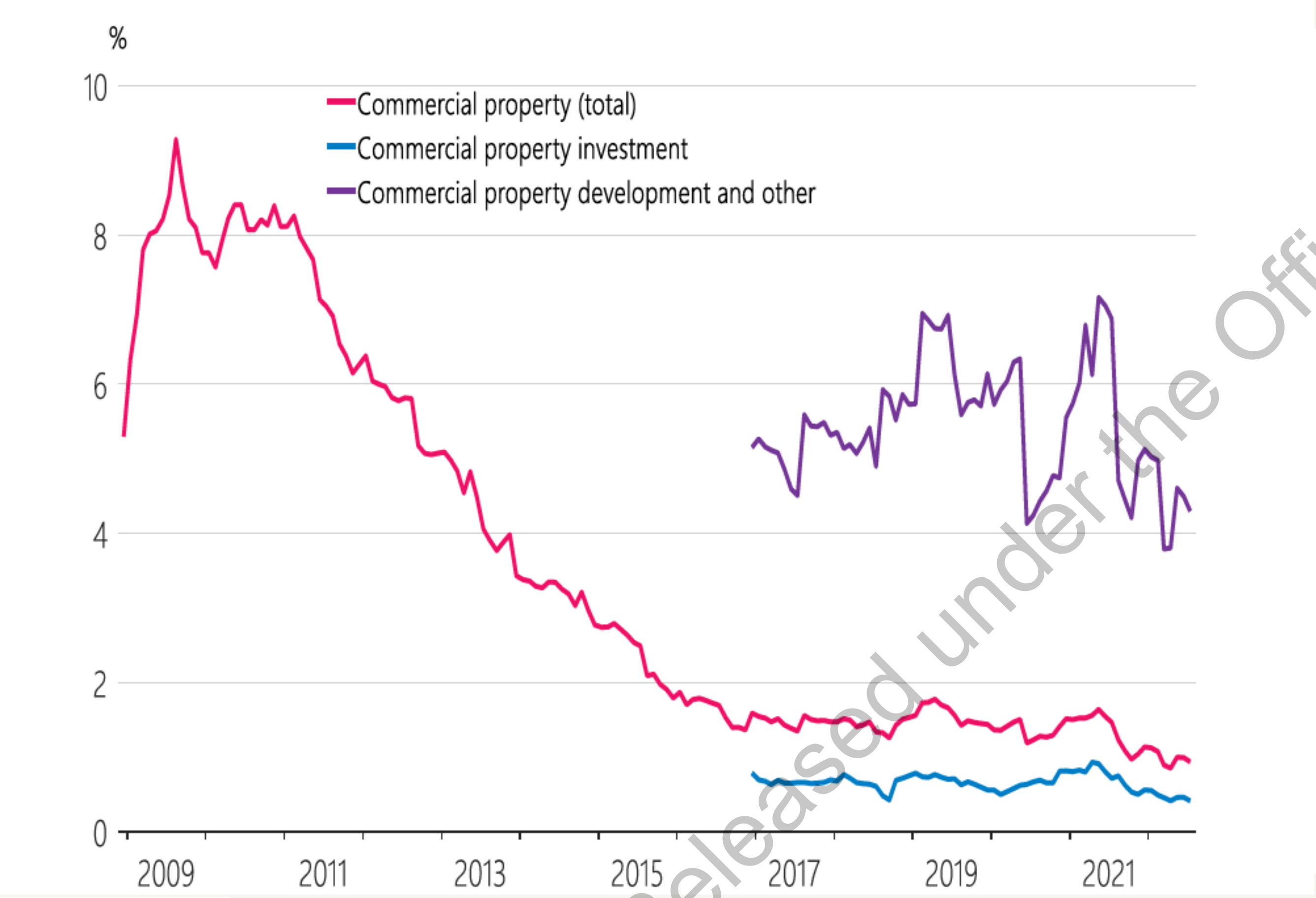


Vacancy rates for Auckland and Wellington CBD

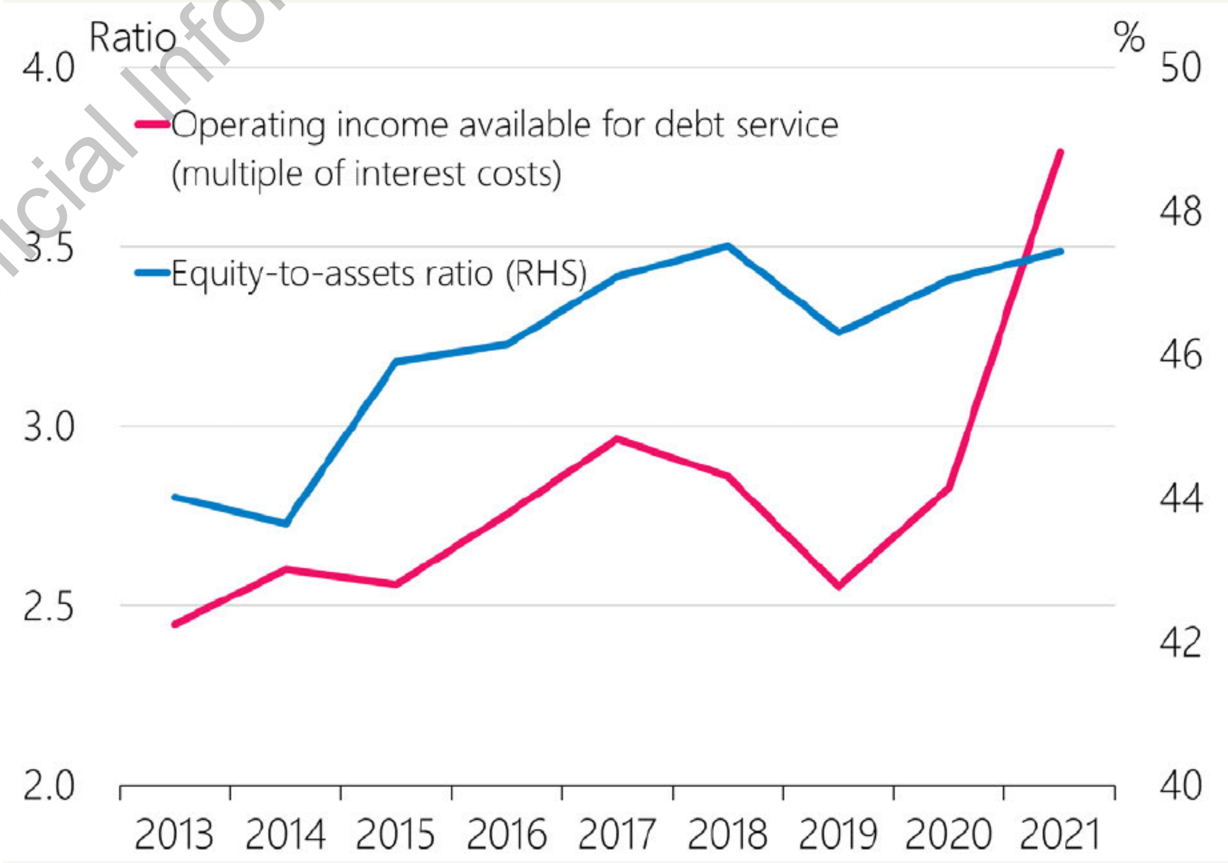


Lending growth and resilience remain high, but until when?

CRE lending - NPL and potentially stressed ratios

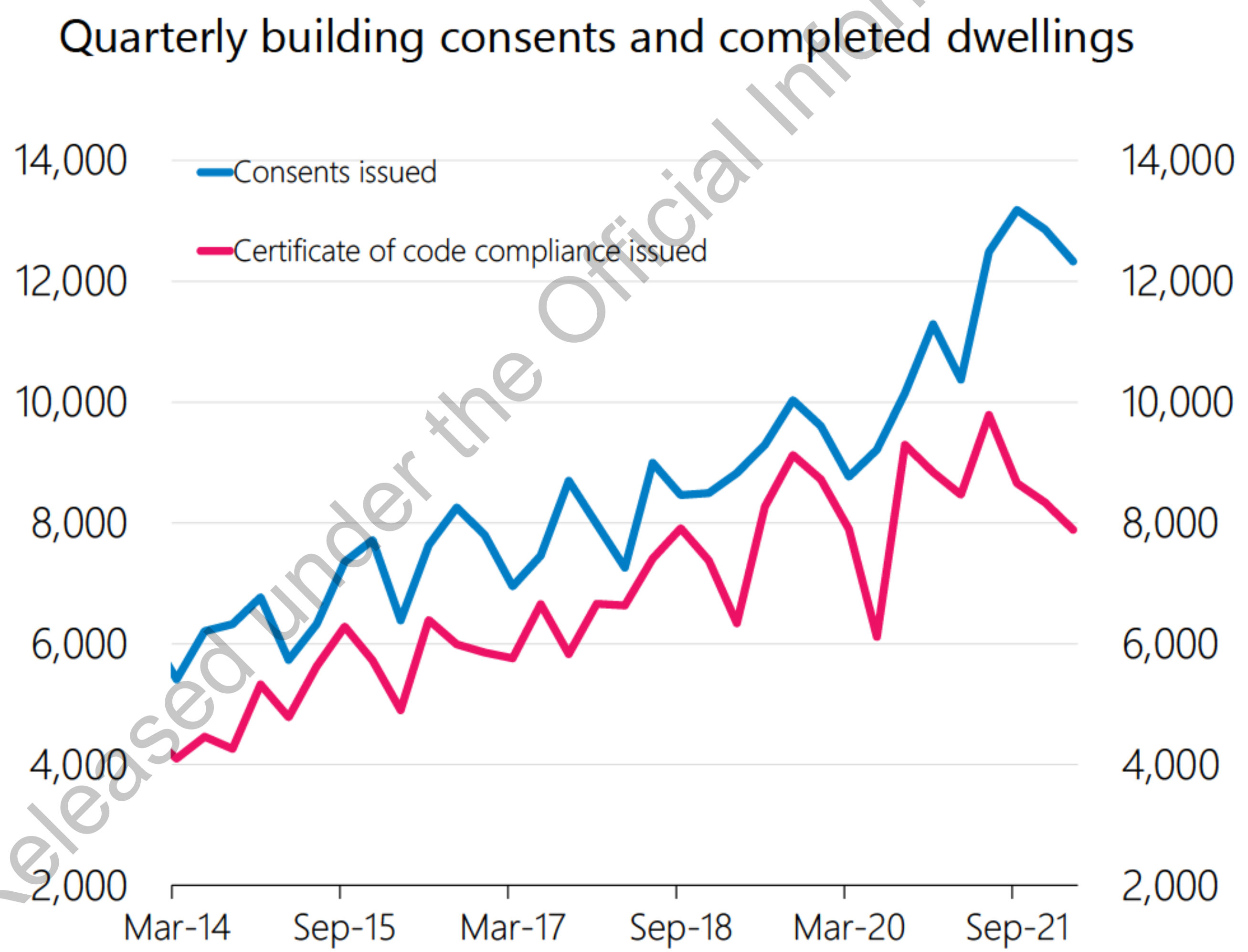


Interest coverage and equity-to-asset ratios

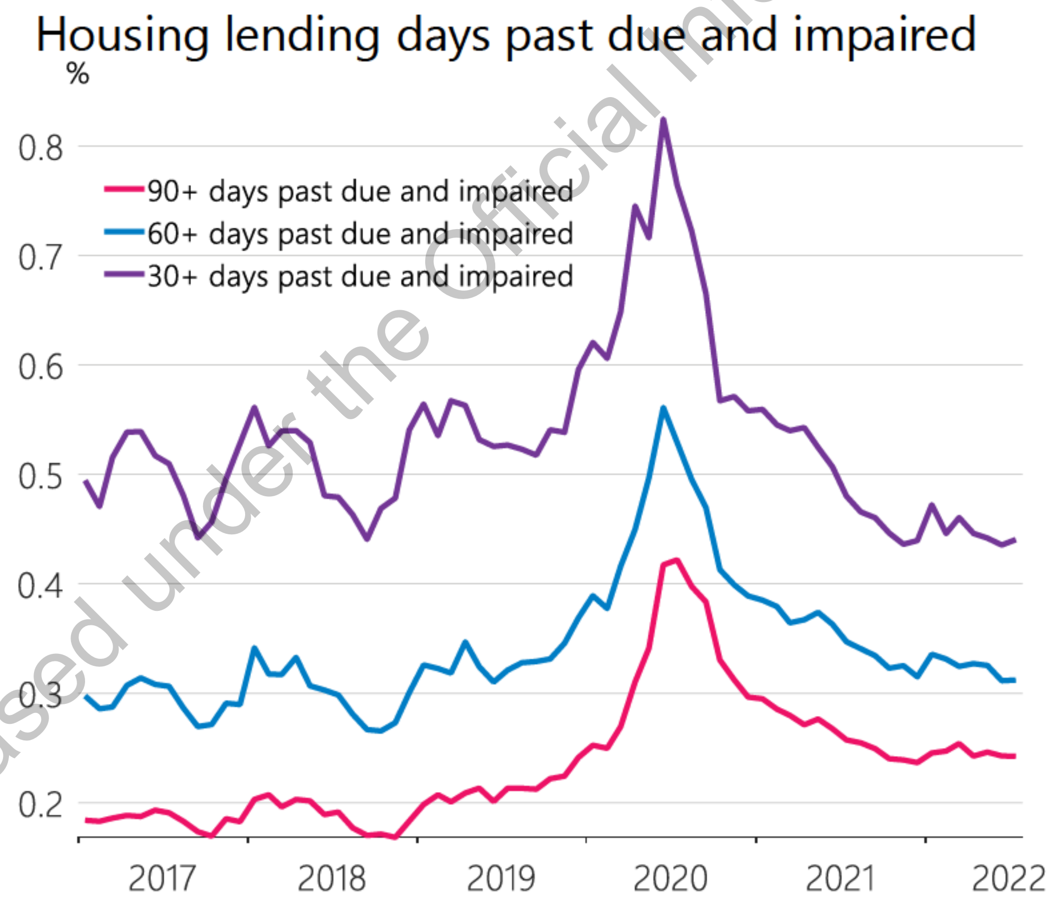


Spare slides

Consents strong but housing supply is capacity constrained

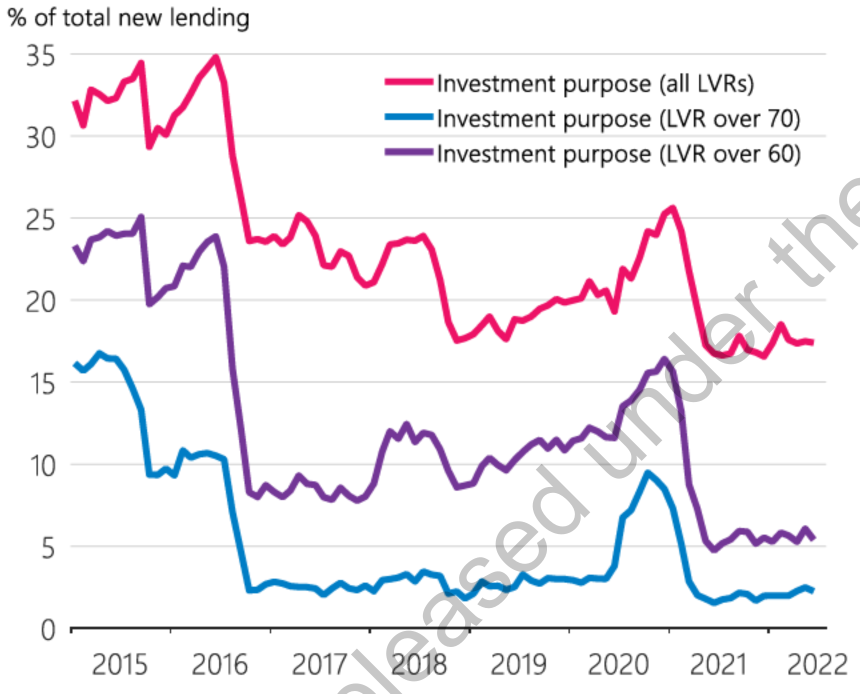


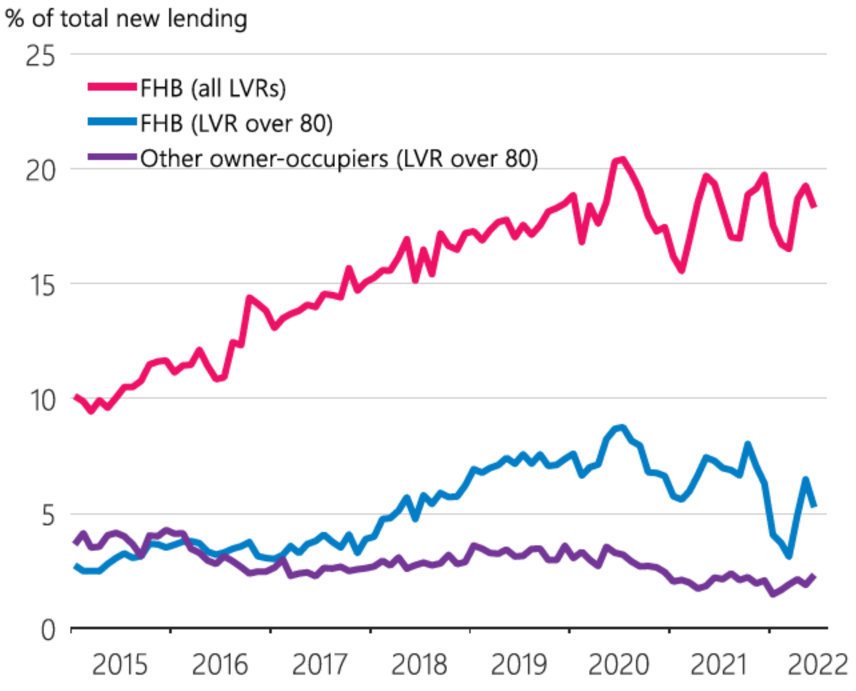
No sign of stress yet in early stage arrears



High LVR lending has fallen, especially for investors

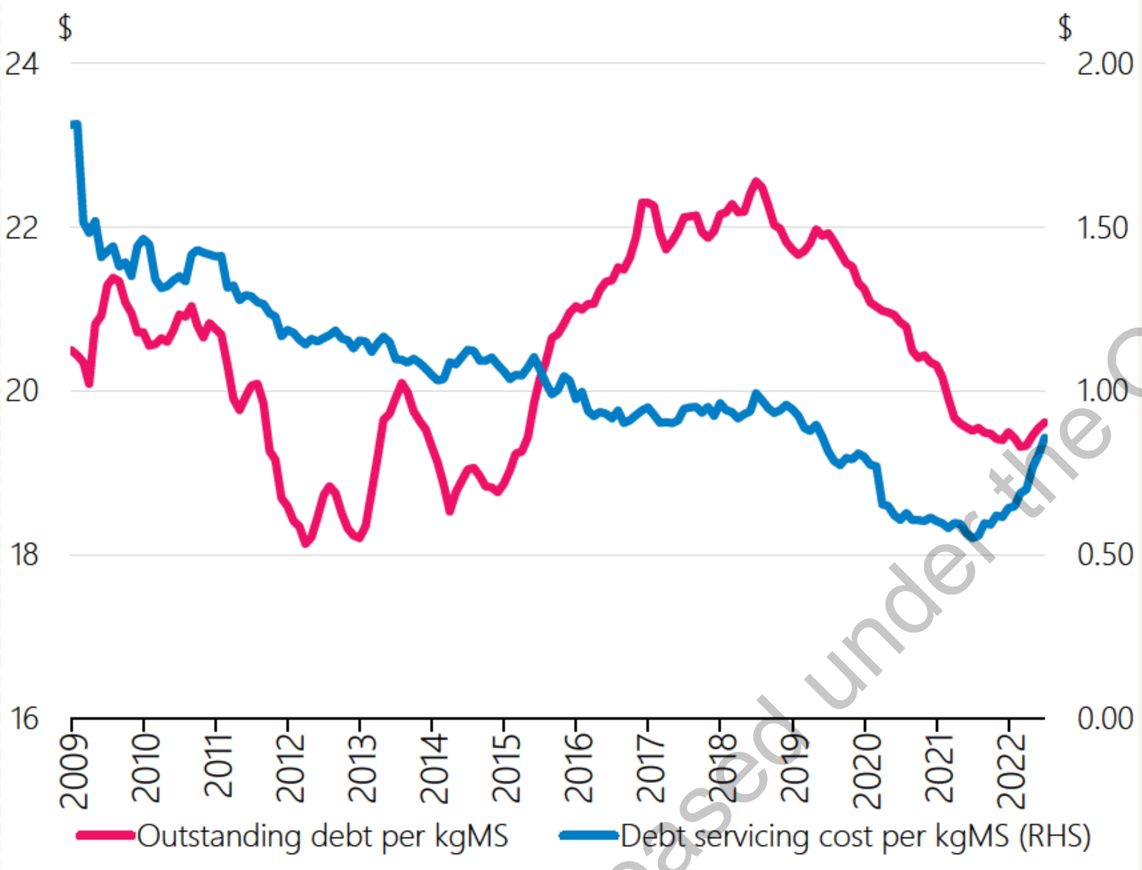
Share of new lending by buyer type and LVR



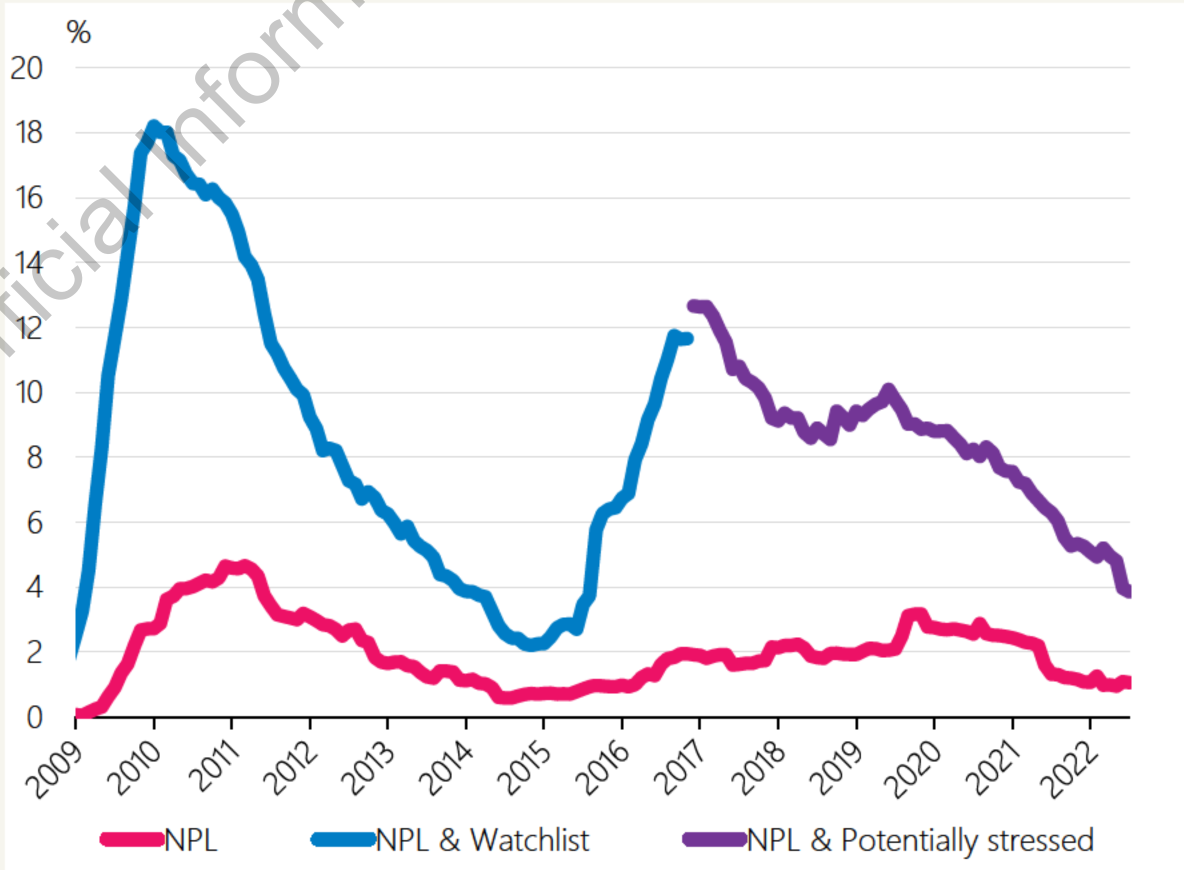


Dairy debt servicing costs have picked up, but banks yet to see stress…

Debt and debt servicing costs per kgMS



Dairy stressed and potentially stressed loans



Document 11

Reserve Bank of New Zealand
Te Pūtea Matua

Pre-FSR November 2022 meeting

Assessment of financial stability risks

Financial System Analysis team, 12 September 2022

Overview

- Risk assessment and vulnerabilities overview
- Global and domestic backdrop
- Sectoral views:

  i. Households

  ii. Residential construction

  iii. Businesses, agriculture and commercial property
- Wrap-up

Risk assessment overview

- Strong and ongoing inflationary pressures are leading central banks to tighten monetary policy more aggressively than previously anticipated.
- New Zealand's financial system is well positioned overall to handle a rising rate environment. Banks are well capitalised, with strong profitability and asset quality.
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Global and domestic backdrop

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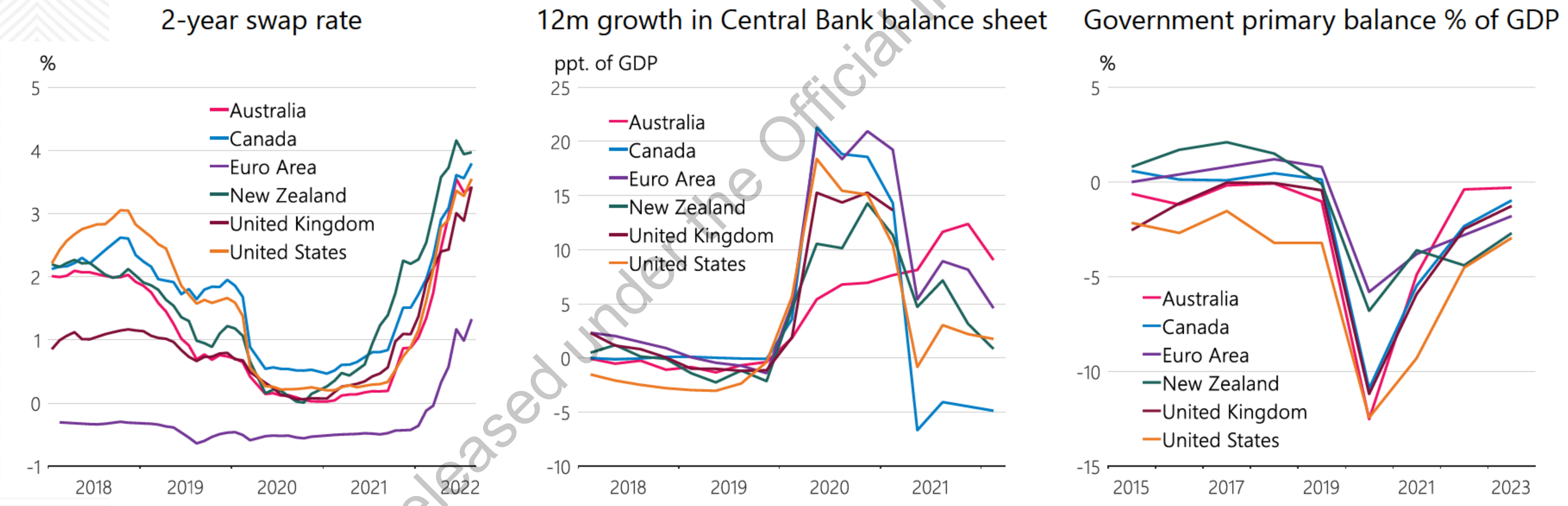
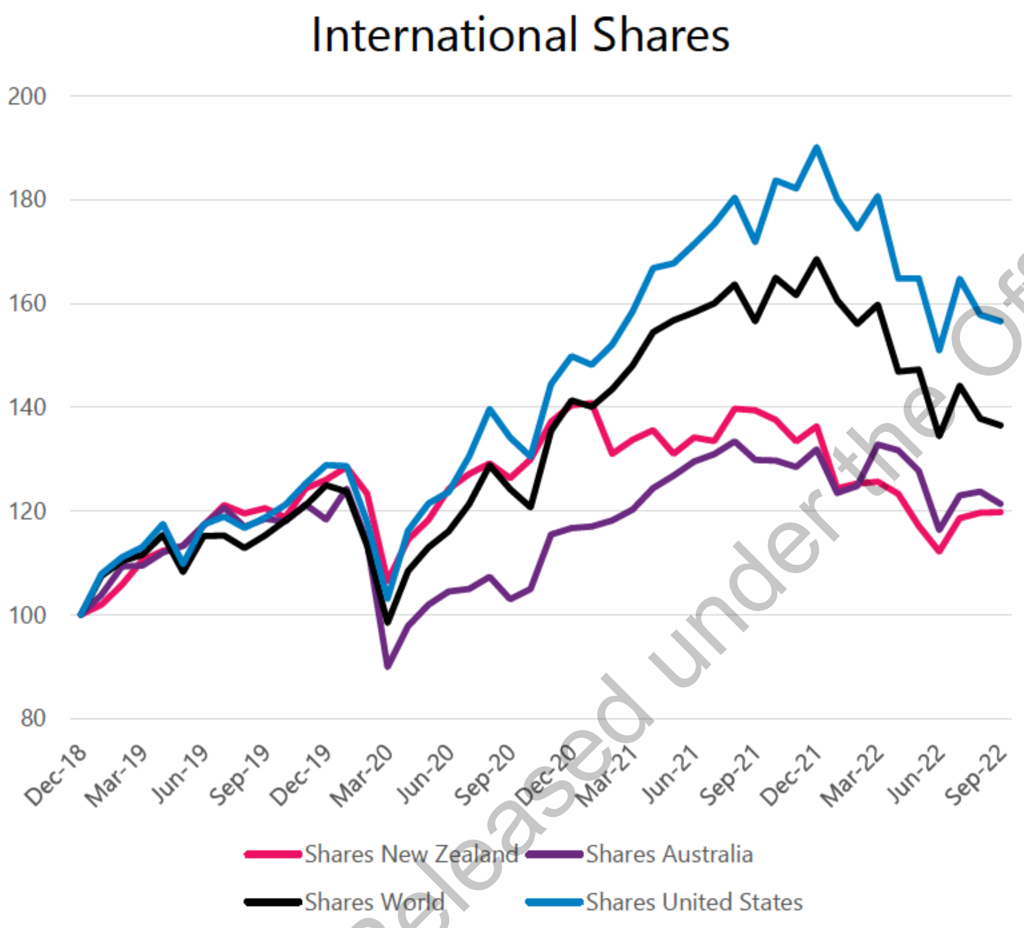
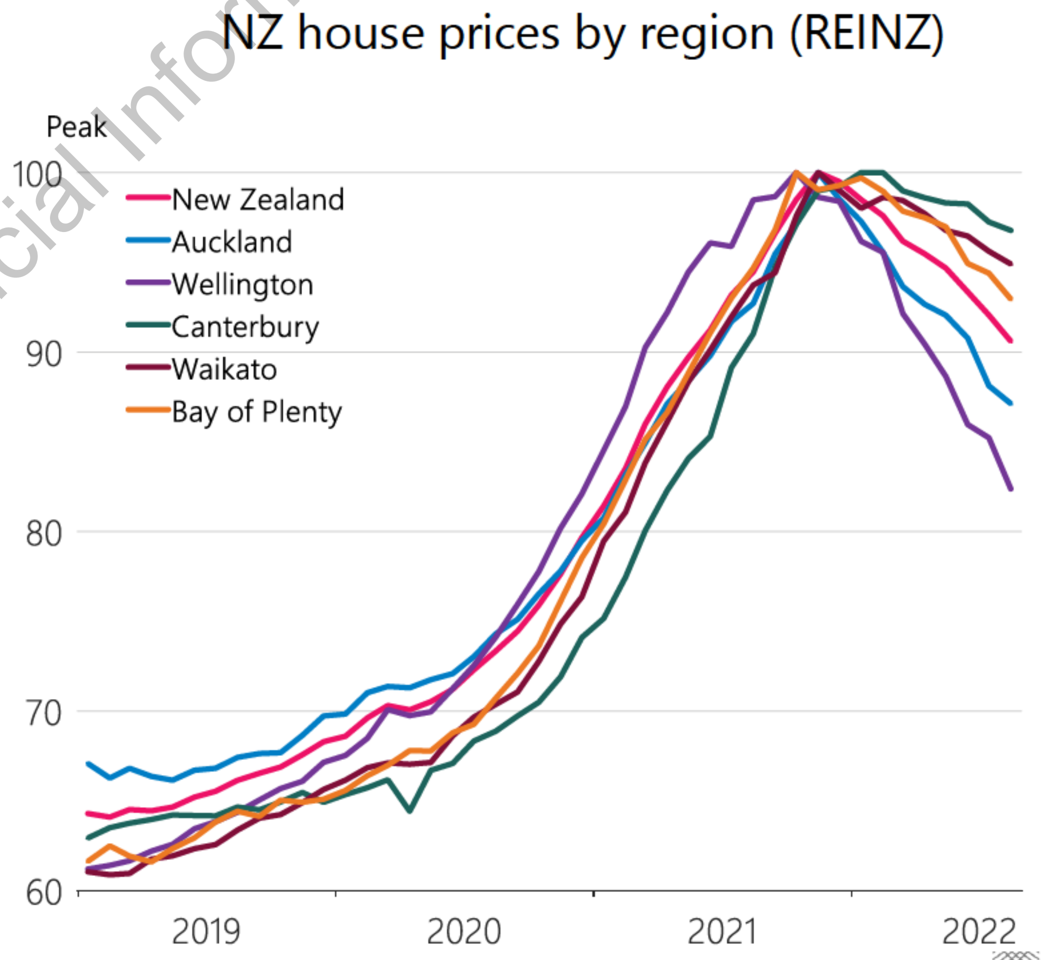


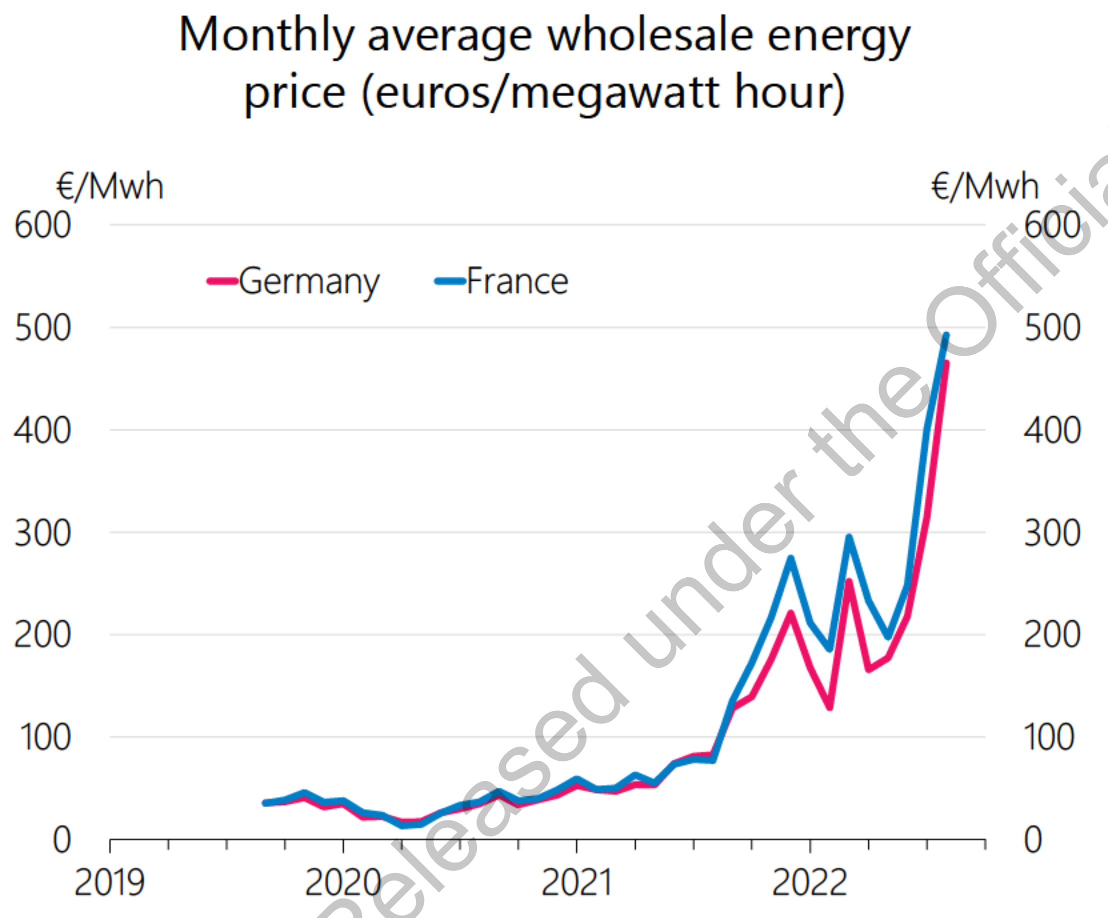
Source: OECD Outlook

Asset prices are declining



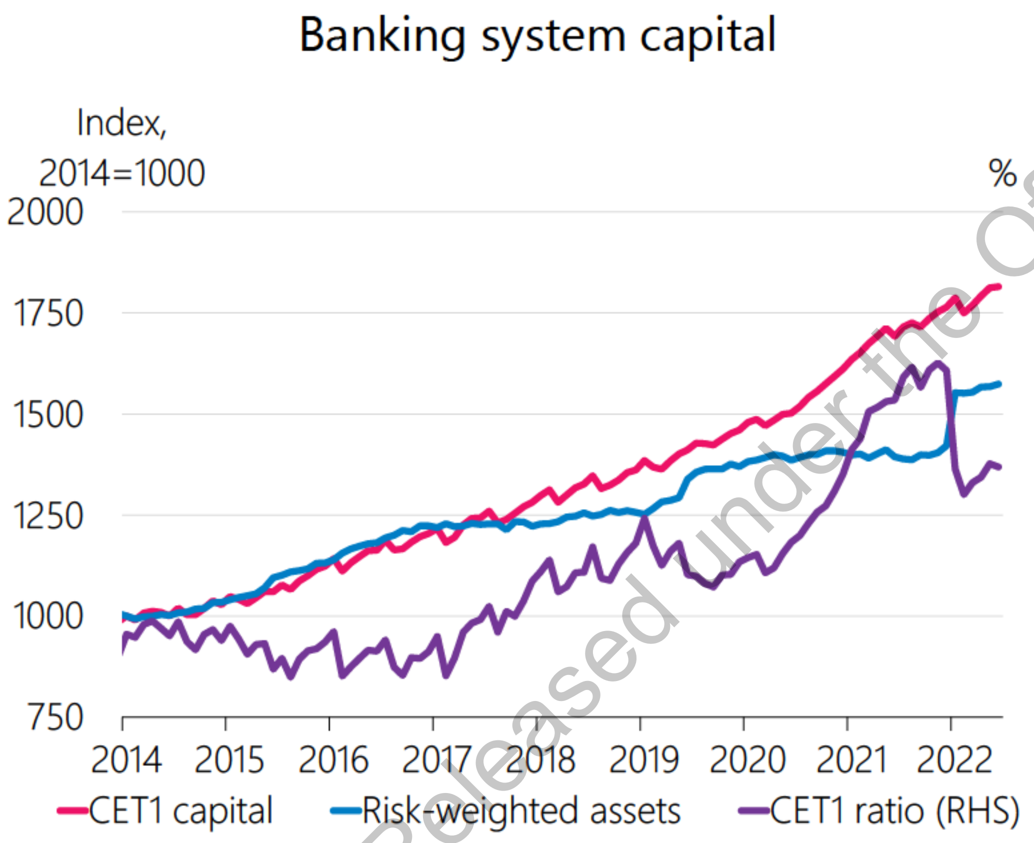


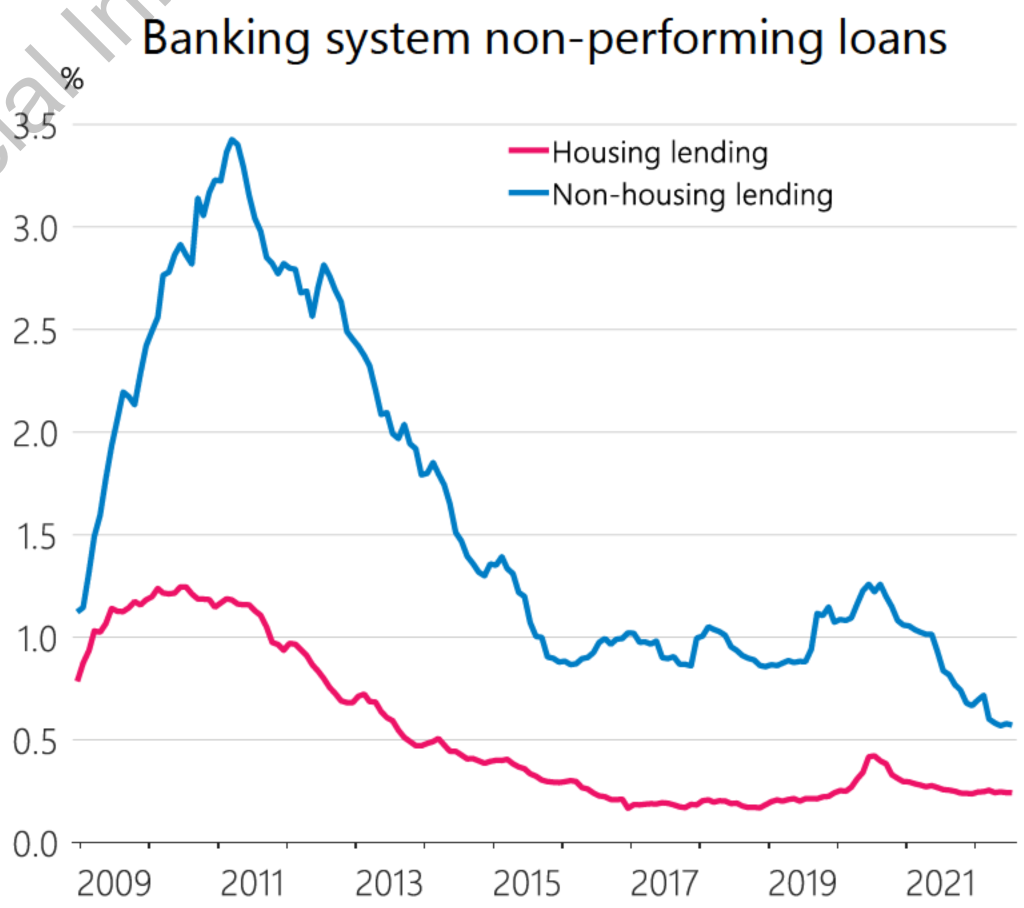
Global growth outlook weakening



Source: Nord Pool

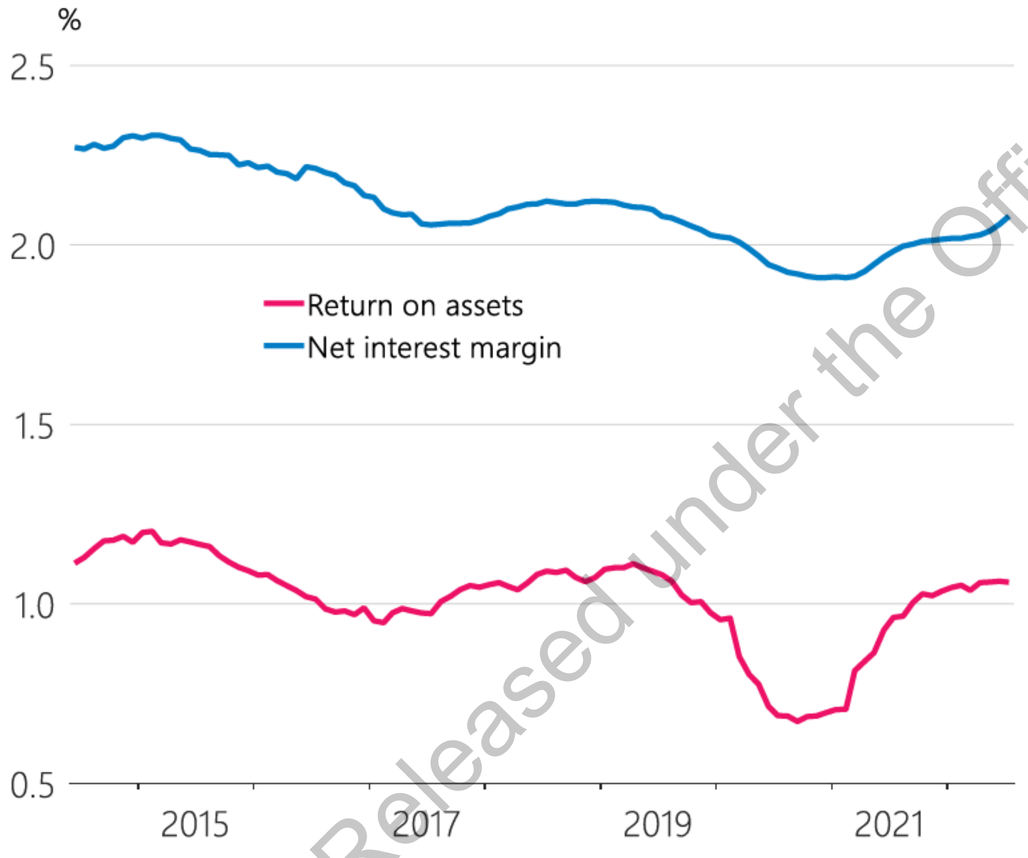
NZ banks are well positioned…



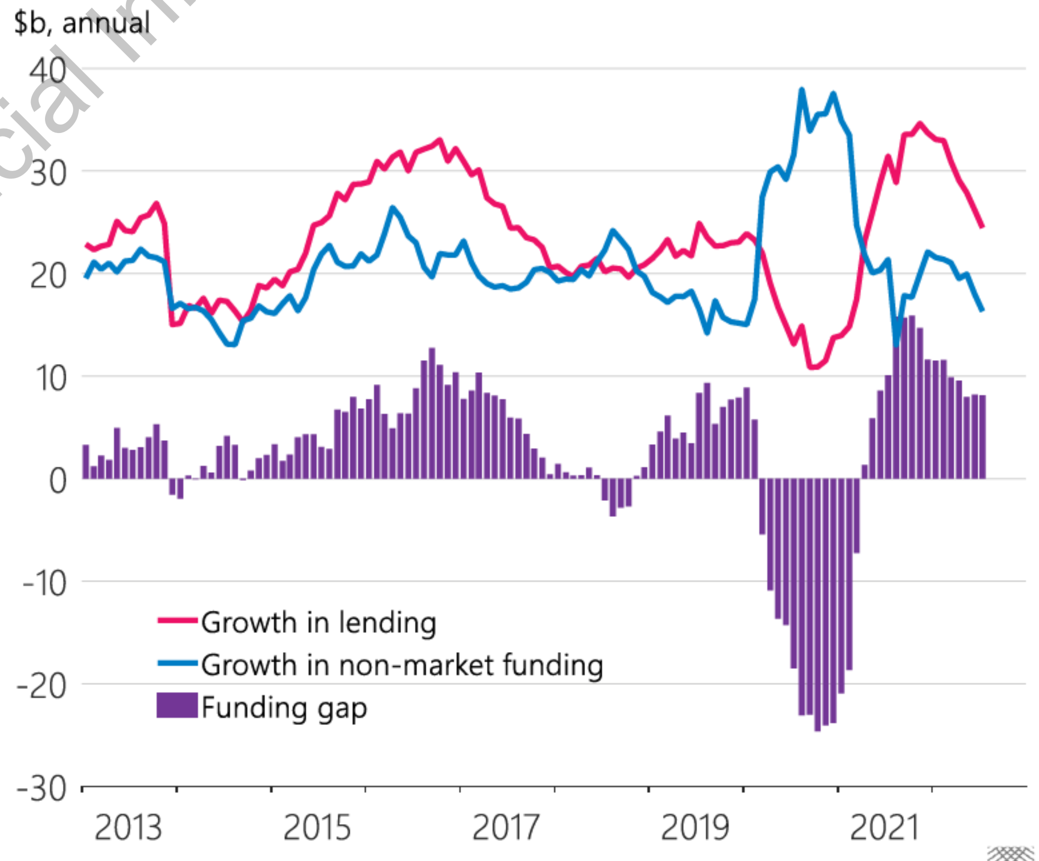


...with strong profitability and funding profiles, as support winds down

Bank profitability indicators



Bank funding needs



Sectoral views:

i. **Households**

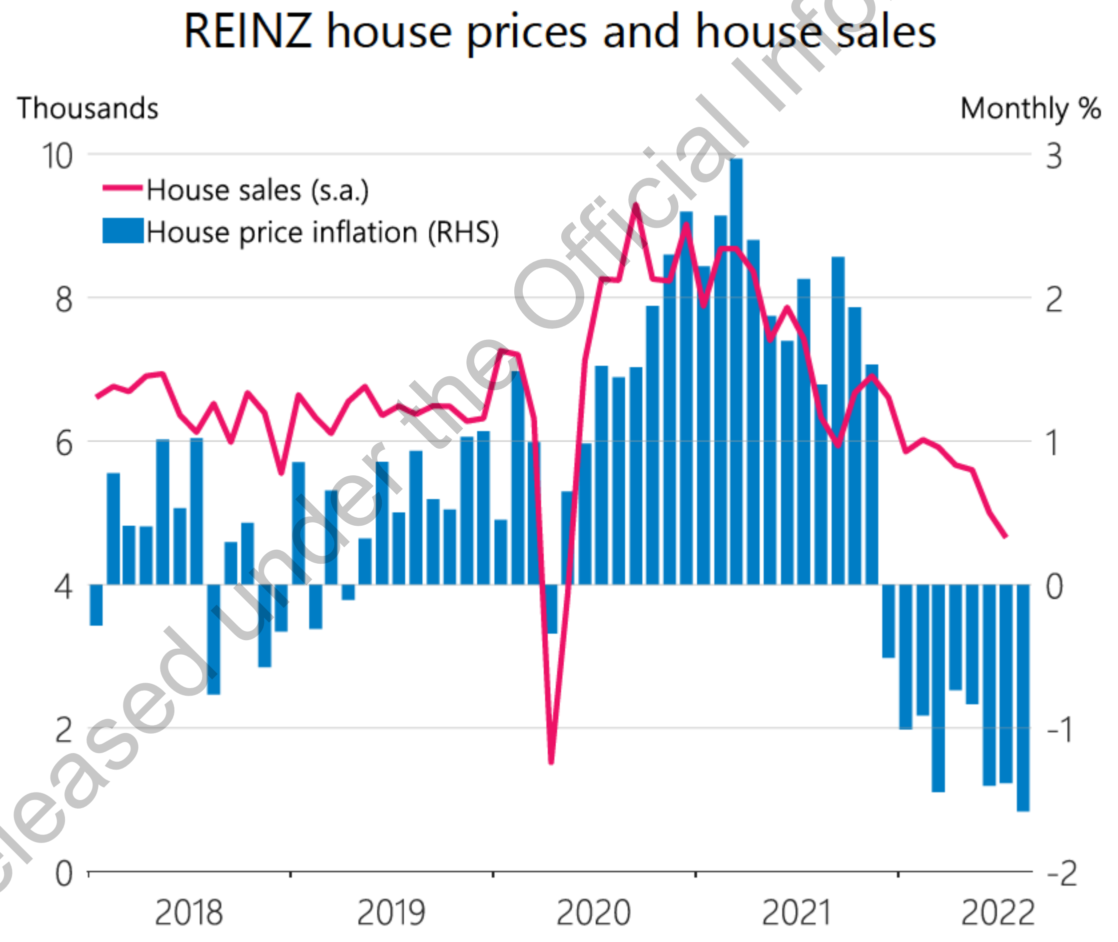
ii. Residential construction

iii. Businesses, agriculture and commercial property

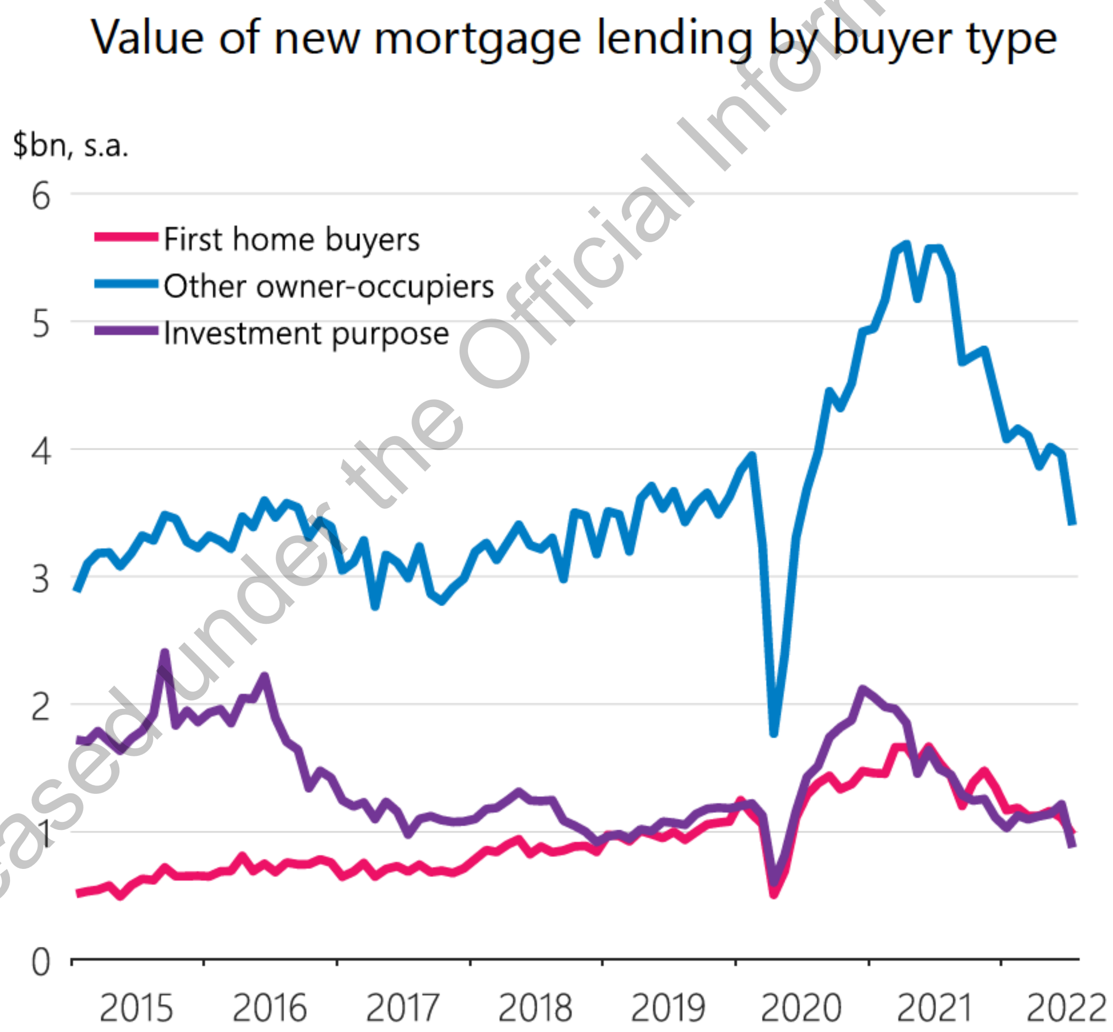
Key points

- Housing market activity continues to soften.
- Housing demand weakened by rising interest rates, falling prices, LVRs and CCCFA.
- Housing supply response is ongoing, but may be constrained in future by collapse in pre-sales.
- Interest rates have risen, but not fully passed through to borrowers.
- Risky household borrowing has fallen sharply.
- Resilience of recent borrowers to falling house prices has increased.
- Rising rates could see some borrowers in serviceability stress.
- Spillovers from falling house prices to real economy uncertain.

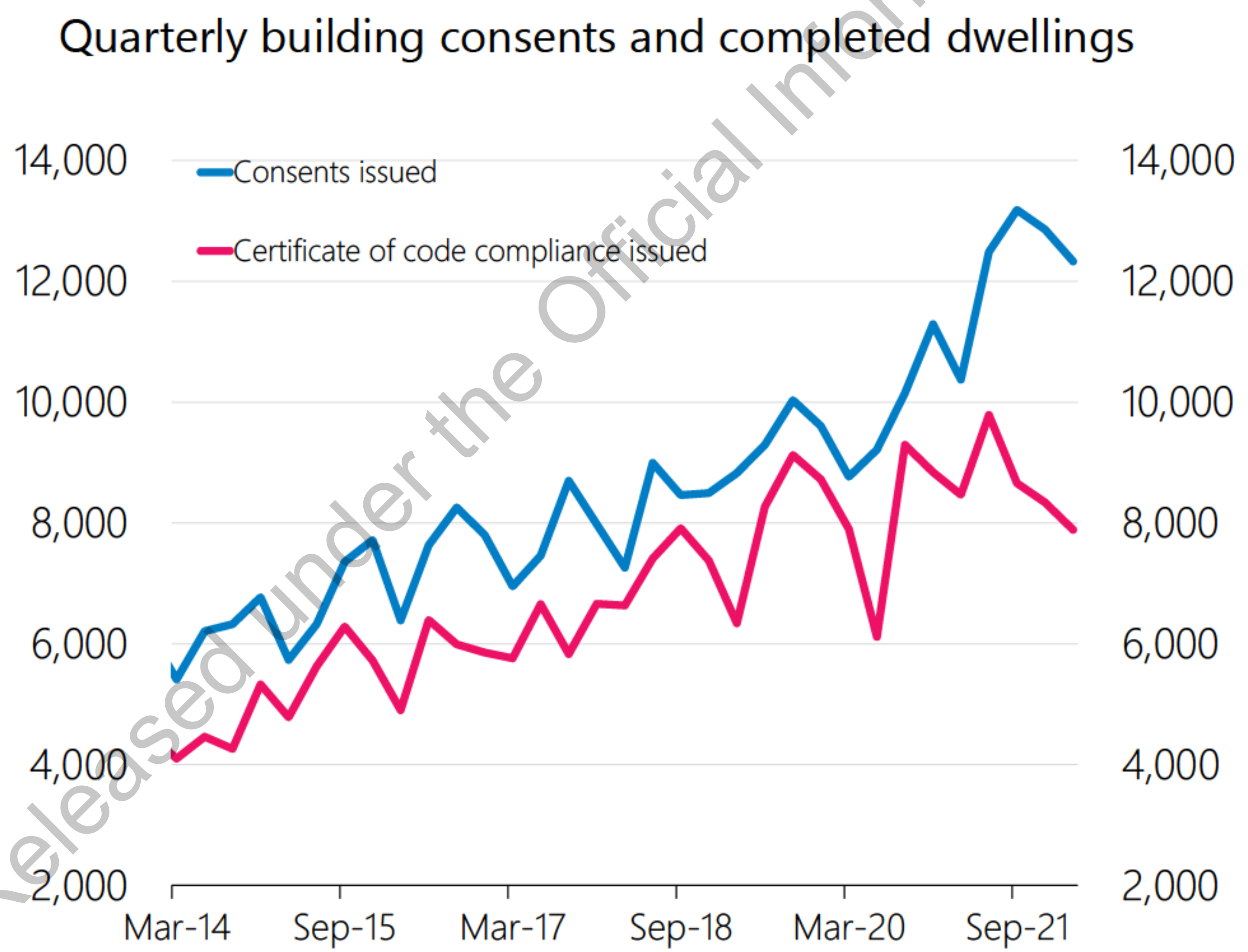
Housing market correction is continuing



Lending growth is also slowing

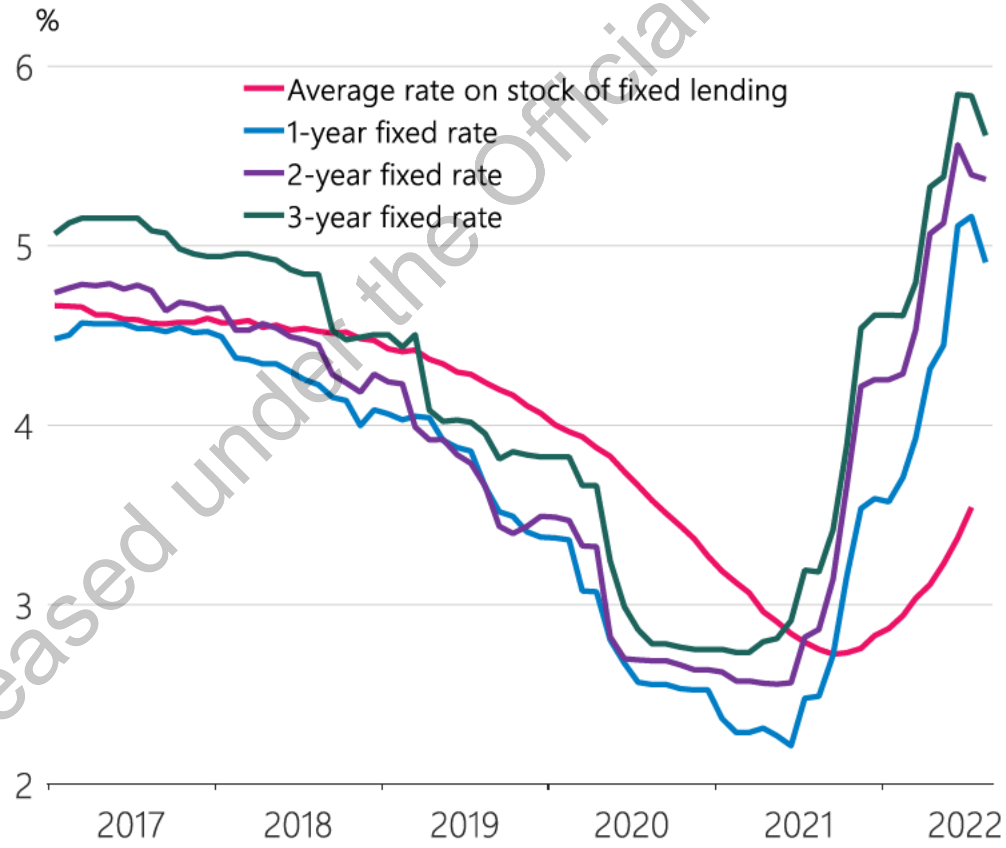


Consents strong but housing supply is capacity constrained



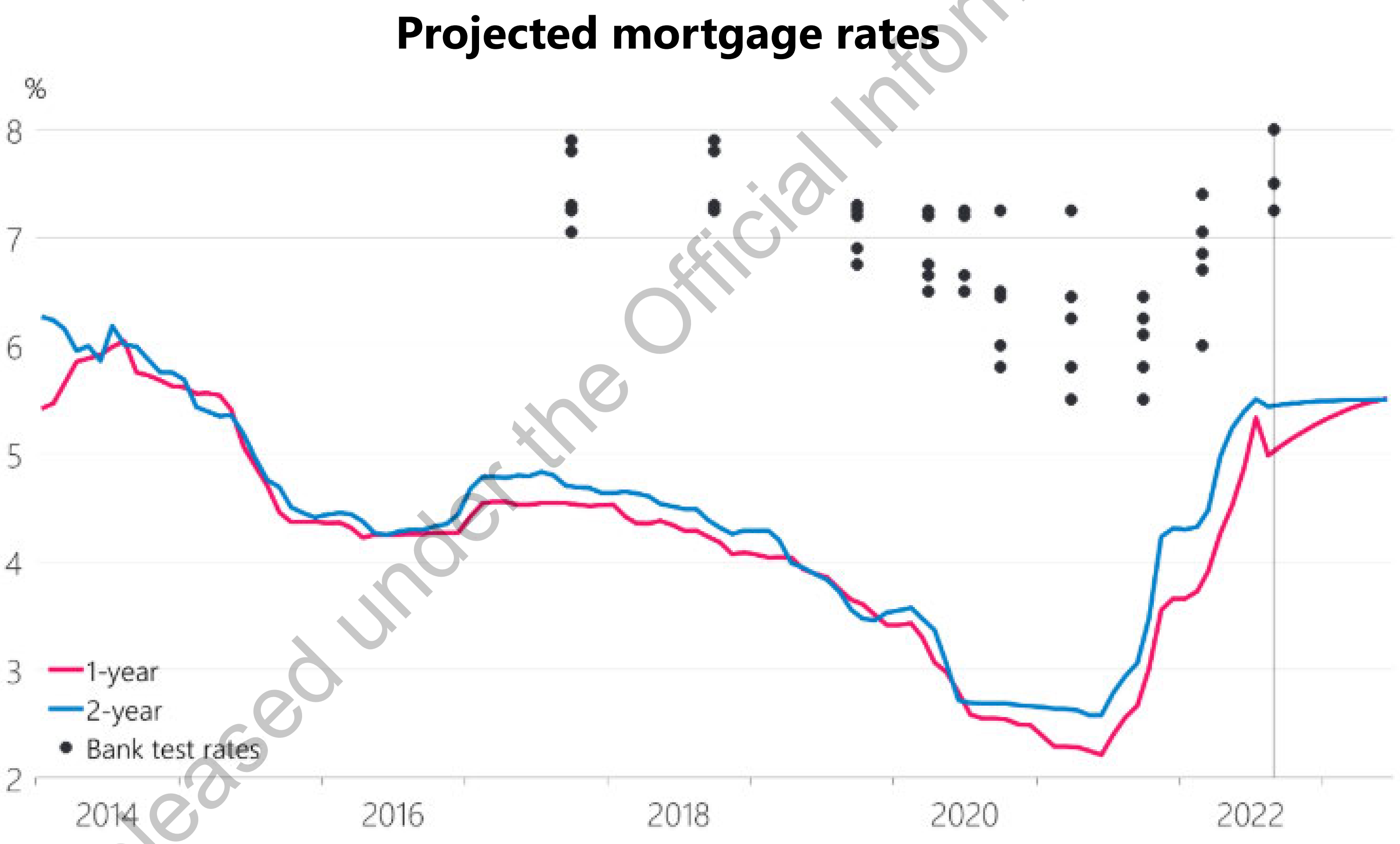
Mortgage rates have risen

New fixed mortgage rates and average rate on existing fixed rate lending

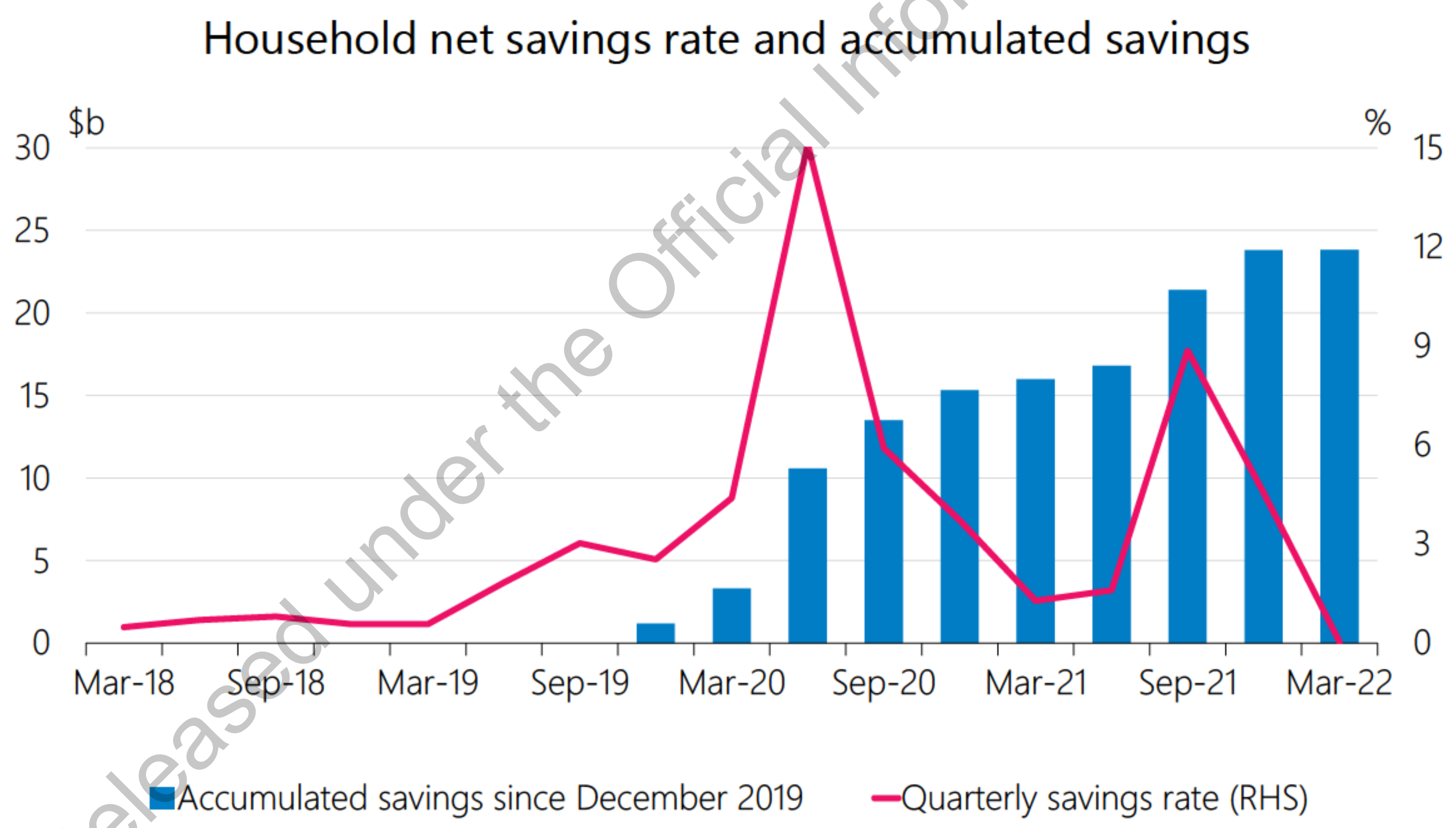


During 2022, around 50% of the fixed rate mortgage stock will reprice

Rates may be near their peak

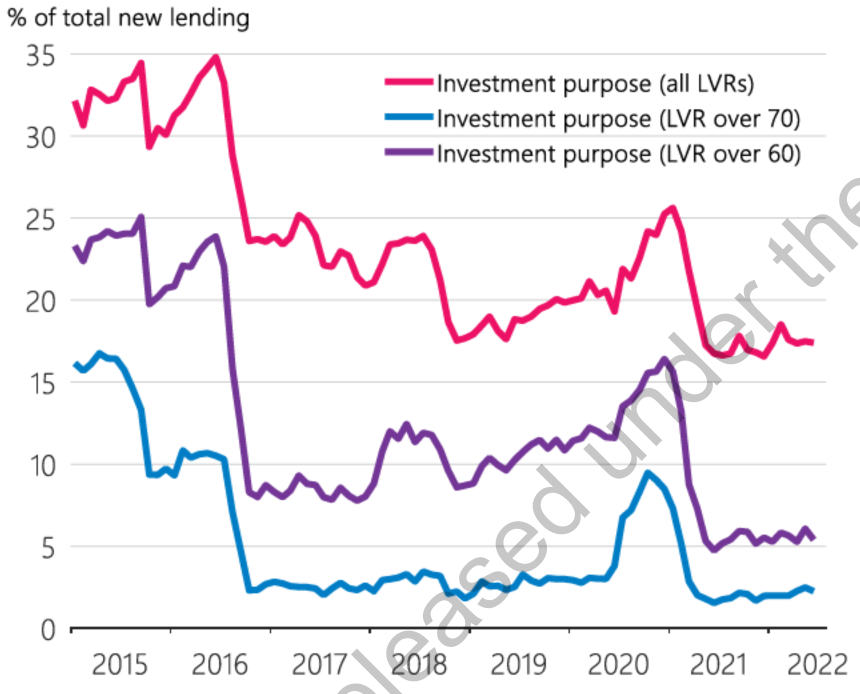


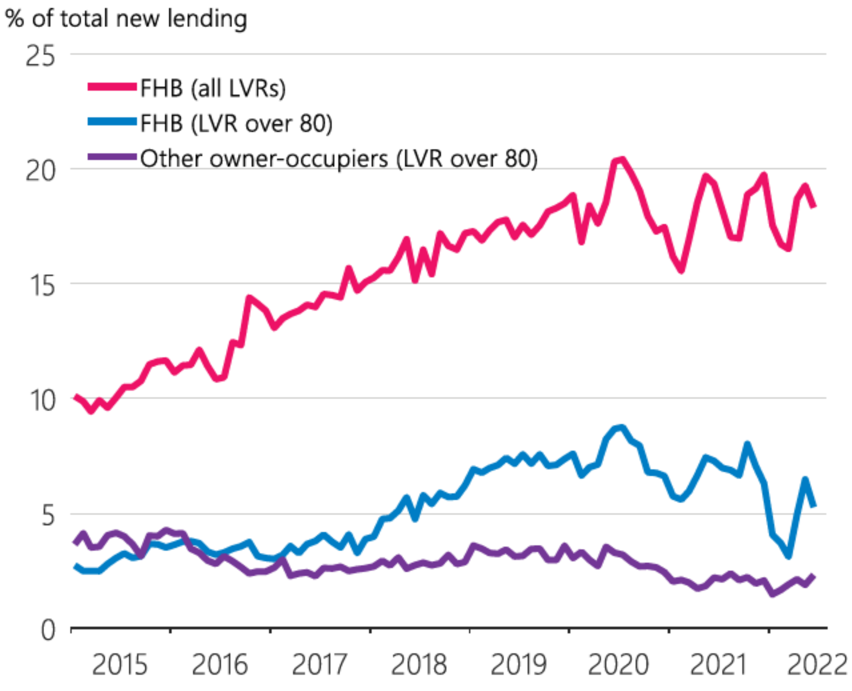
Household savings have levelled off



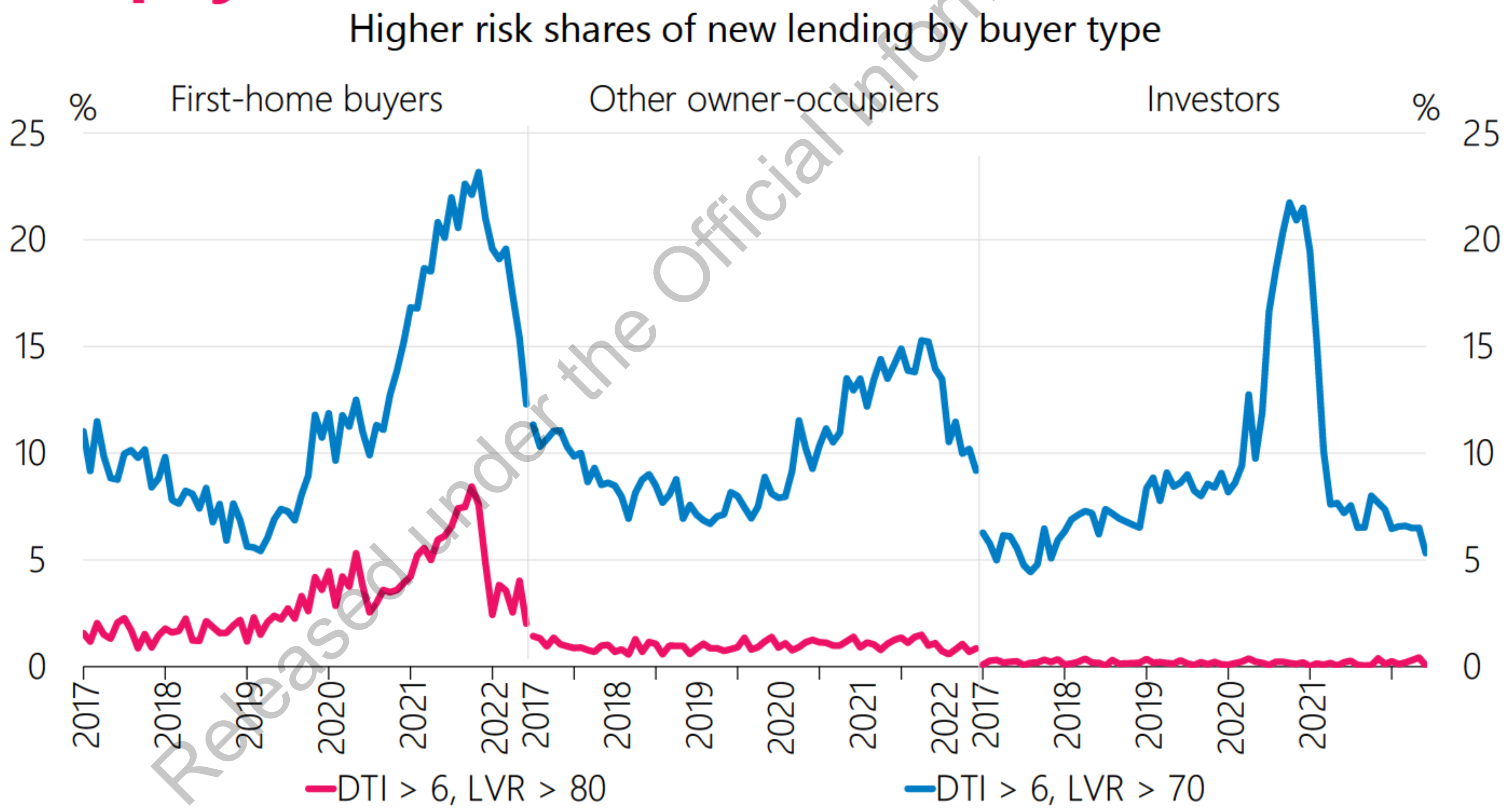
High LVR lending has fallen, especially for investors

Share of new lending by buyer type and LVR

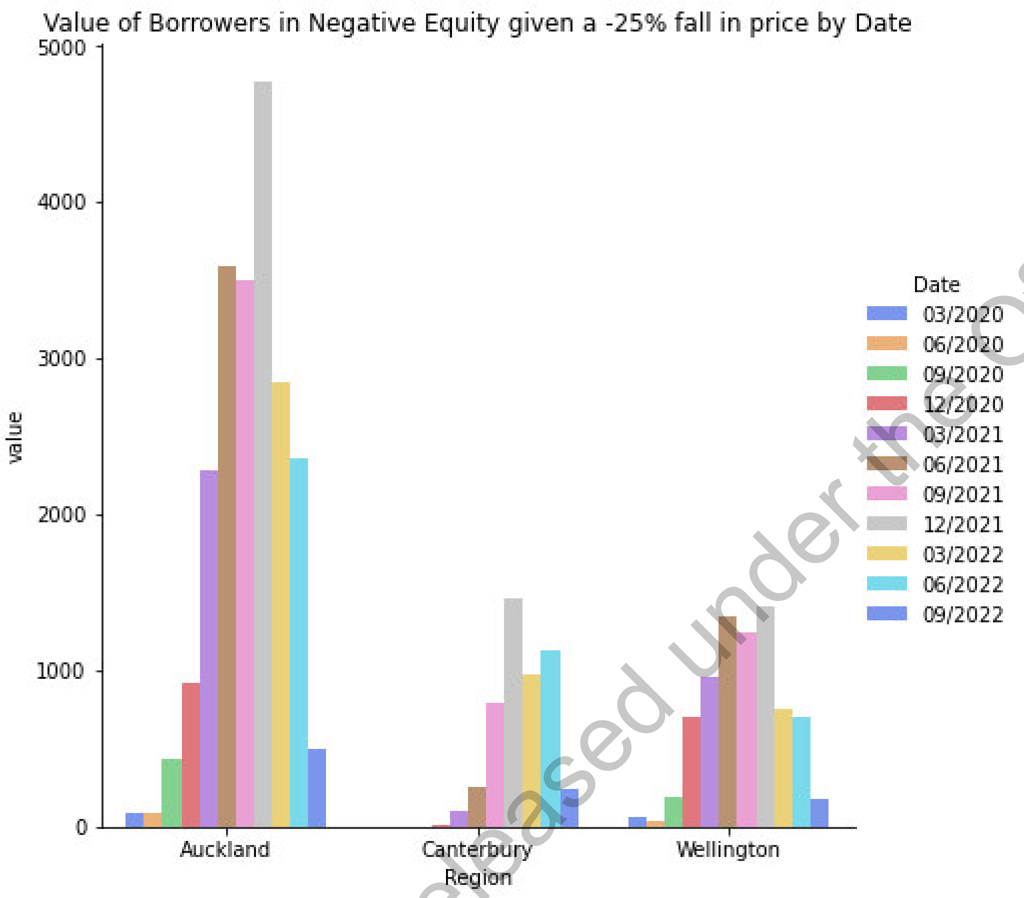


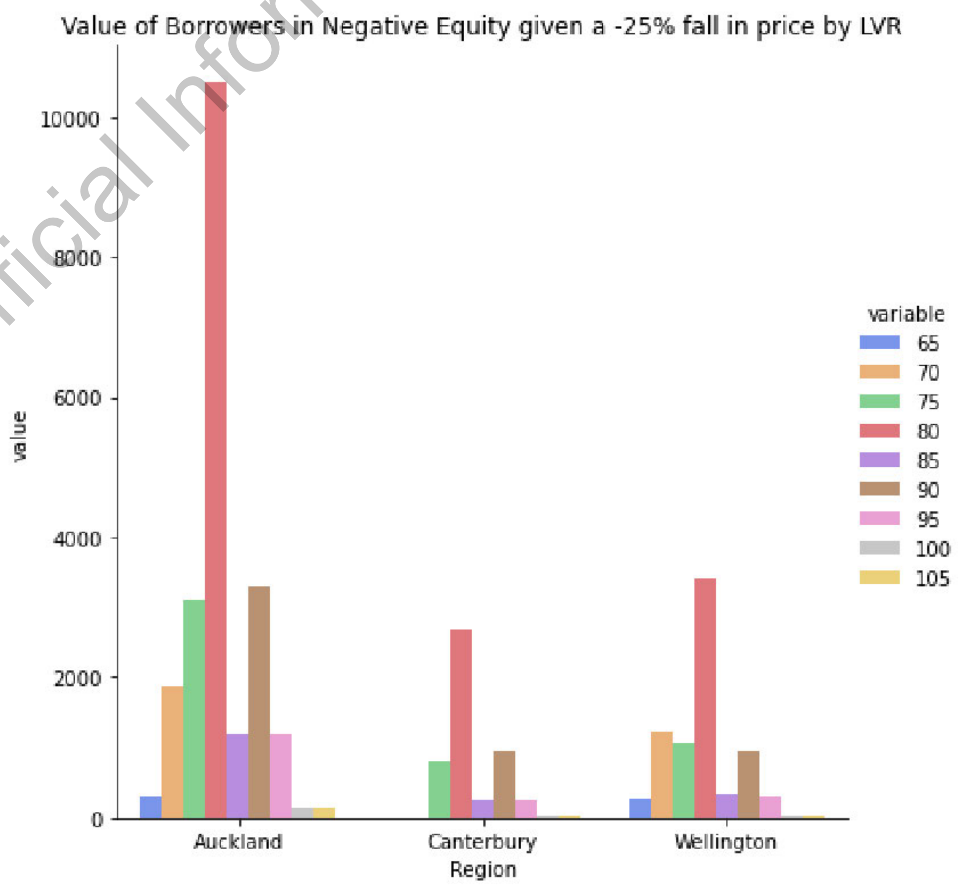


Higher risk lending has fallen sharply



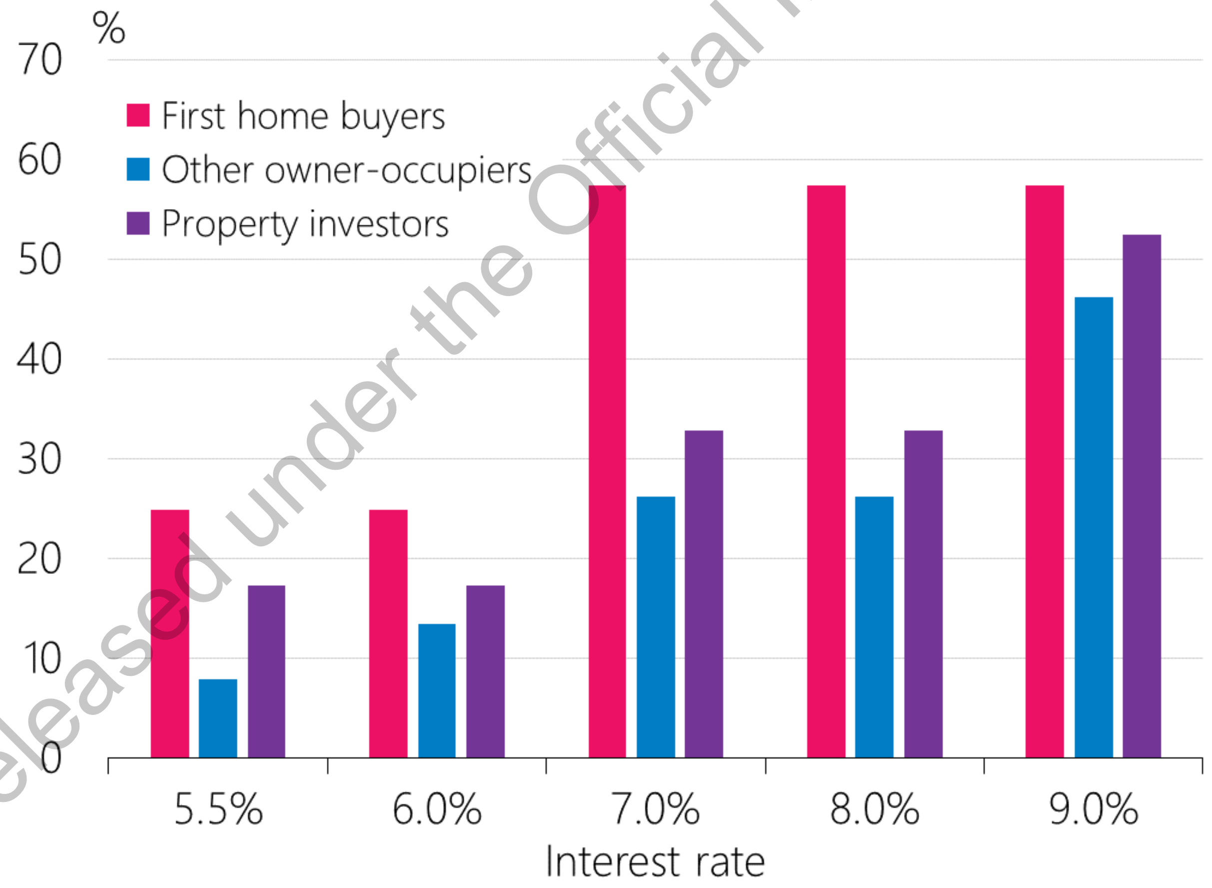
Risk of borrowers going into negative equity



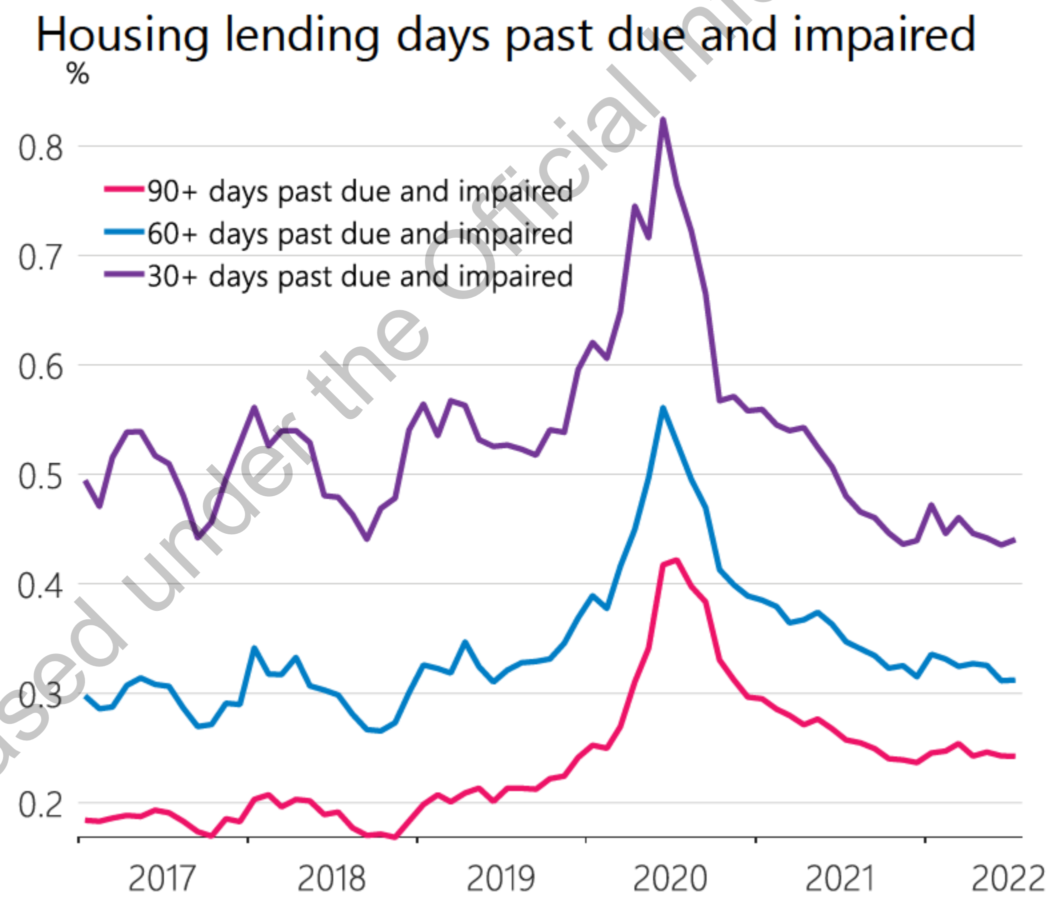


Increases in mortgage rates would see some recent buyers face serviceability stress

Estimated share of lending in the year to Dec 2021 that would face serviceability stress under different interest rates, by buyer type



No sign of stress yet in early stage arrears



Questions

- What are your expectations for the housing market in the next year?
- Do you agree with the assessment of housing market risks?
- What do you think about institutional resilience to house price shocks?
- What do you think about possible economic spillovers of the housing market correction?

Sectoral views:

i. Households

ii. Residential construction

iii. Businesses, agriculture and commercial property

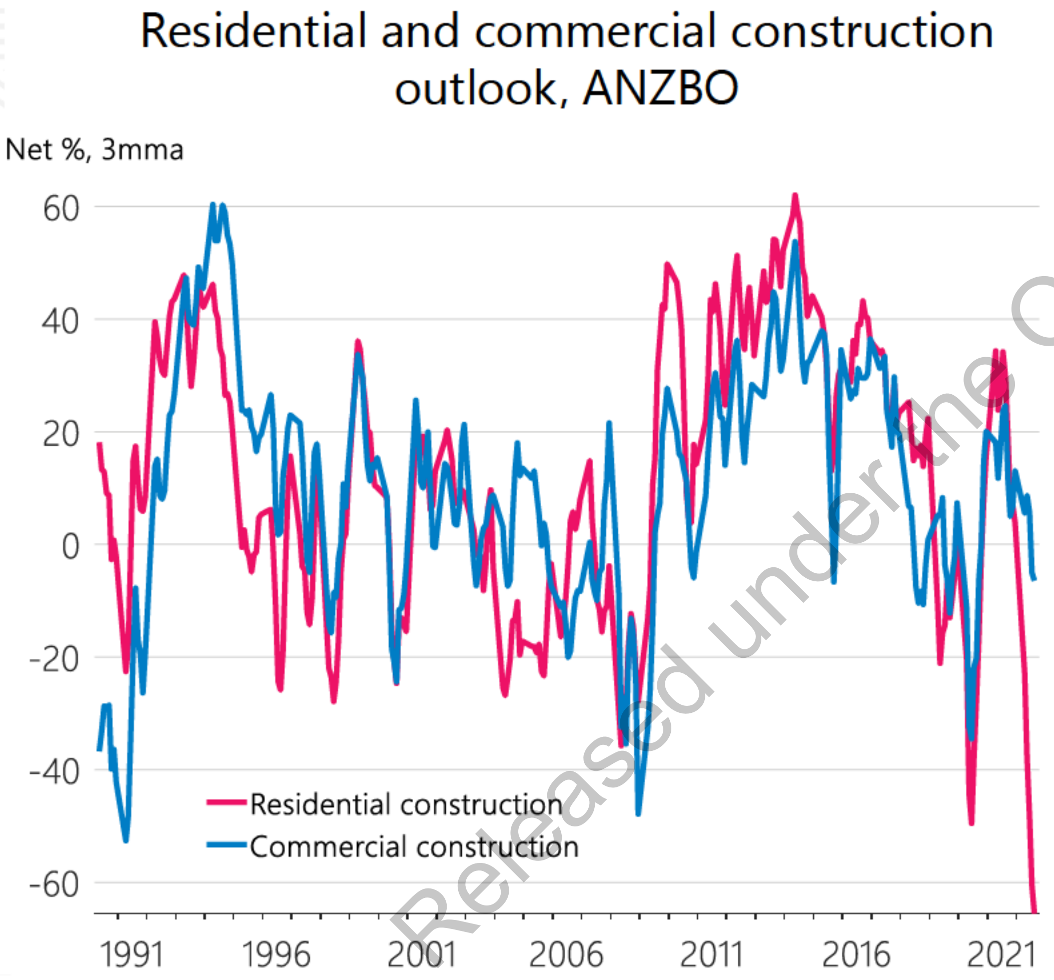
Residential development outlook has deteriorated

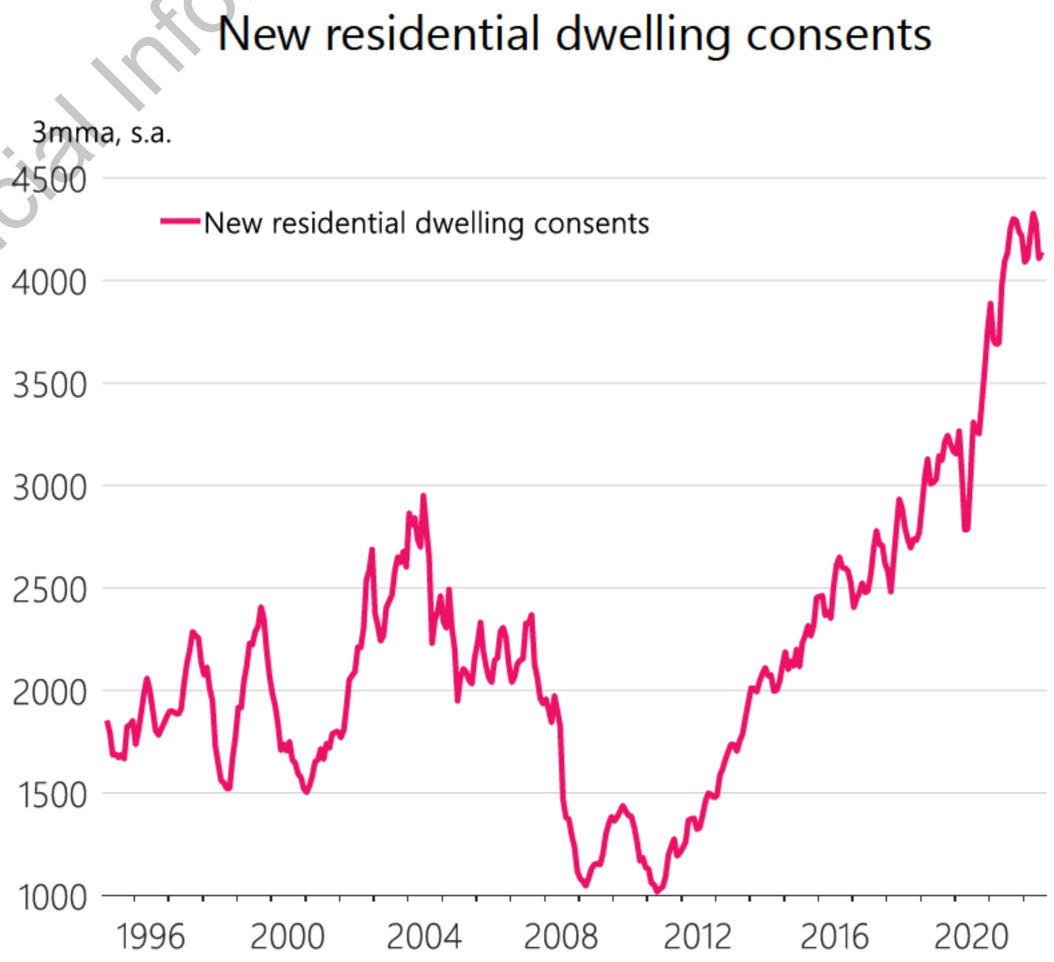
- Consistent message from bank liaison meetings that the market for residential presales has slowed dramatically (down ~80% overall).
- Potential new build buyers are stepping away from the market, making it very difficult for developers to meet qualifying presale conditions for bank finance.
- Drop in presales is in line with the broader housing market downturn. Buyers see prices falling in 12 months time and hence no urgency to buy off plan.
- Existing or turnkey property offers better value, due to more favourable current market conditions (number of listings etc.), and less uncertainty about effect of rising interest rates/reduced borrowing capacity/construction cost inflation/risk of developer failing.

Development expected to slow

- Developer margins have fallen sharply from around 30% to 10%. Developers are being squeezed by high and uncertain costs and falling selling prices. Fixed price construction is no longer an option.
- Banks reflect construction cost uncertainty in the amount they are willing to lend to end buyers (~15% contingency), reducing effective borrowing capacity.
- Banks have had conservative risk settings for several years, but haven't tightened their development lending criteria recently. Instead, the number of economically viable new development projects has declined.
- Some developers who bought at the peak of land prices are looking to on-sell land where feasible, or wait for a pickup in presales.
- Banks are working with developers at a later stage of development to complete work. This pipeline looks to be ending in around 6-12 months.

Surveyed outlook is pessimistic, but consents still running high





Questions

- How plausible is a soft landing?
- Will falling land prices and/or greater development capacity in cities help to make new builds more attractive again?
- Is a slowdown in development just the mechanism and natural consequence of tightening monetary policy?
- Banks believe they are relatively insulated, e.g. due to conservative lending standards – is this realistic?

Sectoral views:

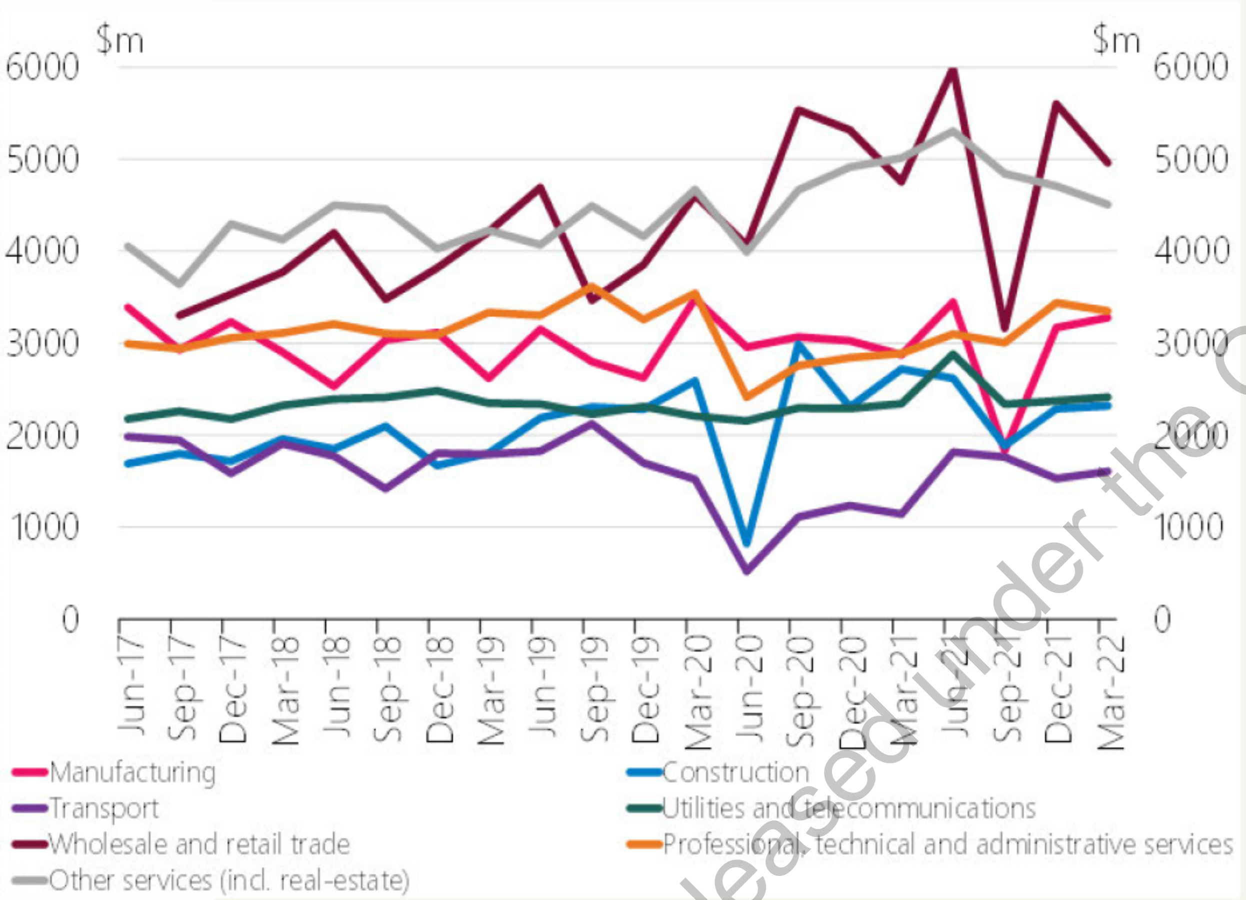
i. Households

ii. Residential construction

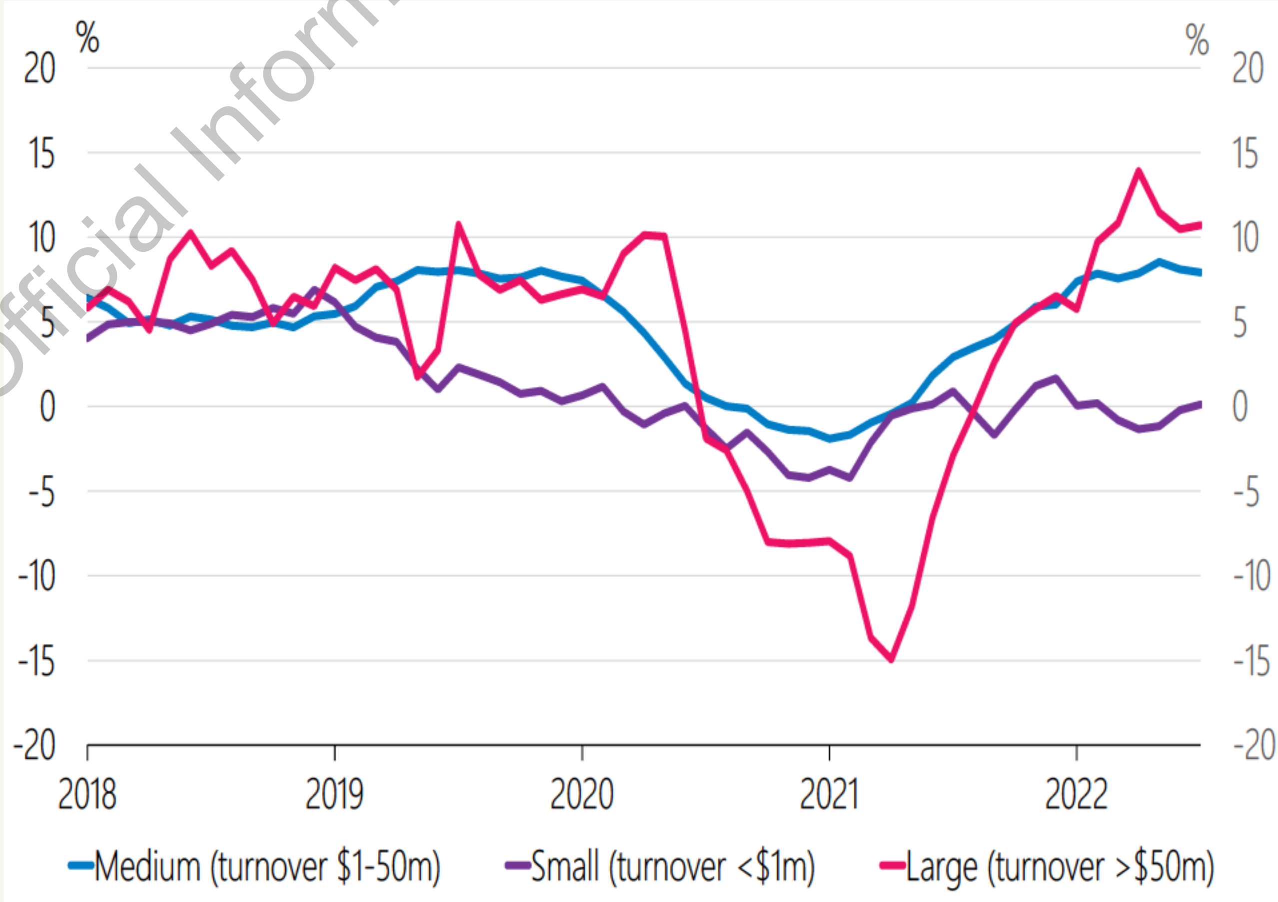
iii. Businesses, agriculture and commercial property

Businesses currently face solid demand…

Quarterly operating profits by sector

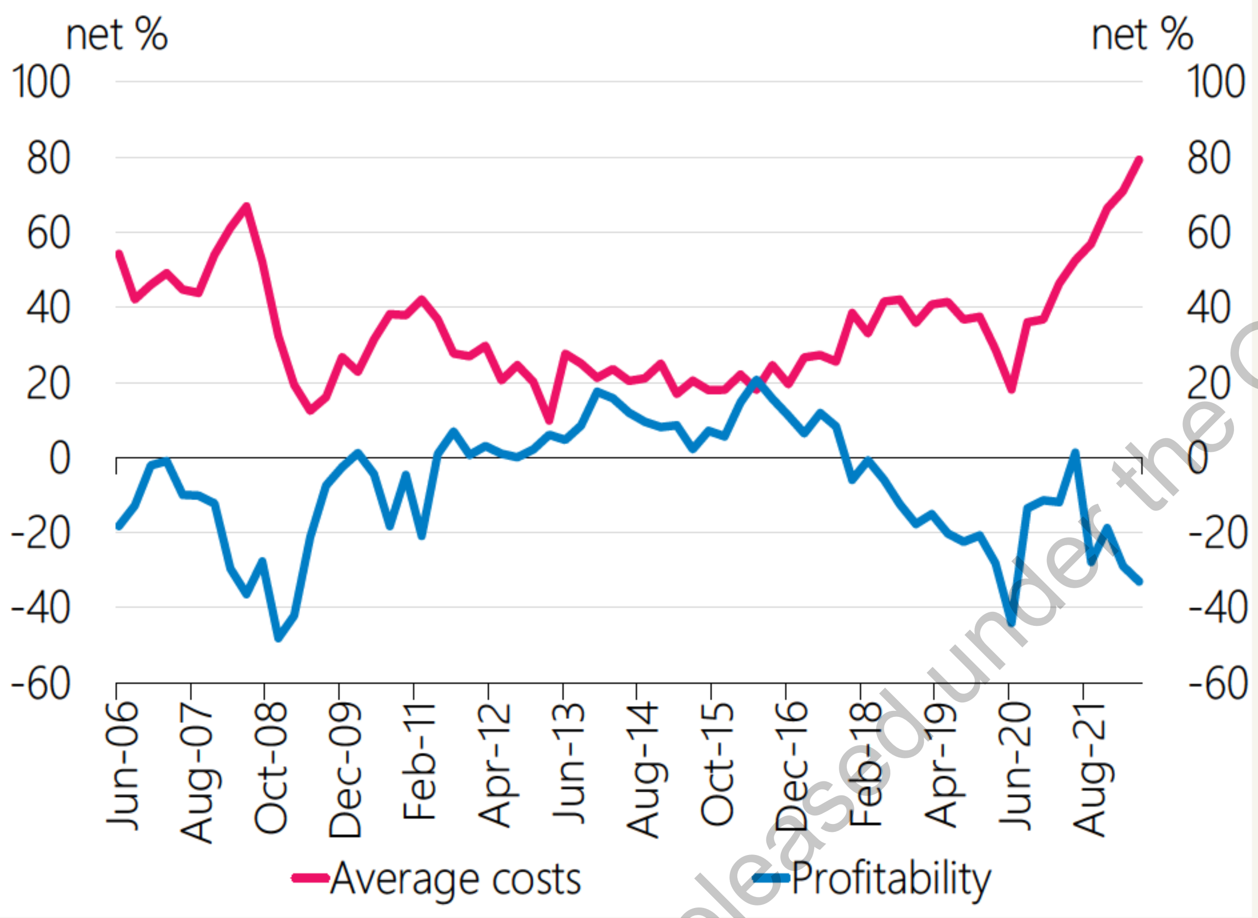


Business lending growth by firm size

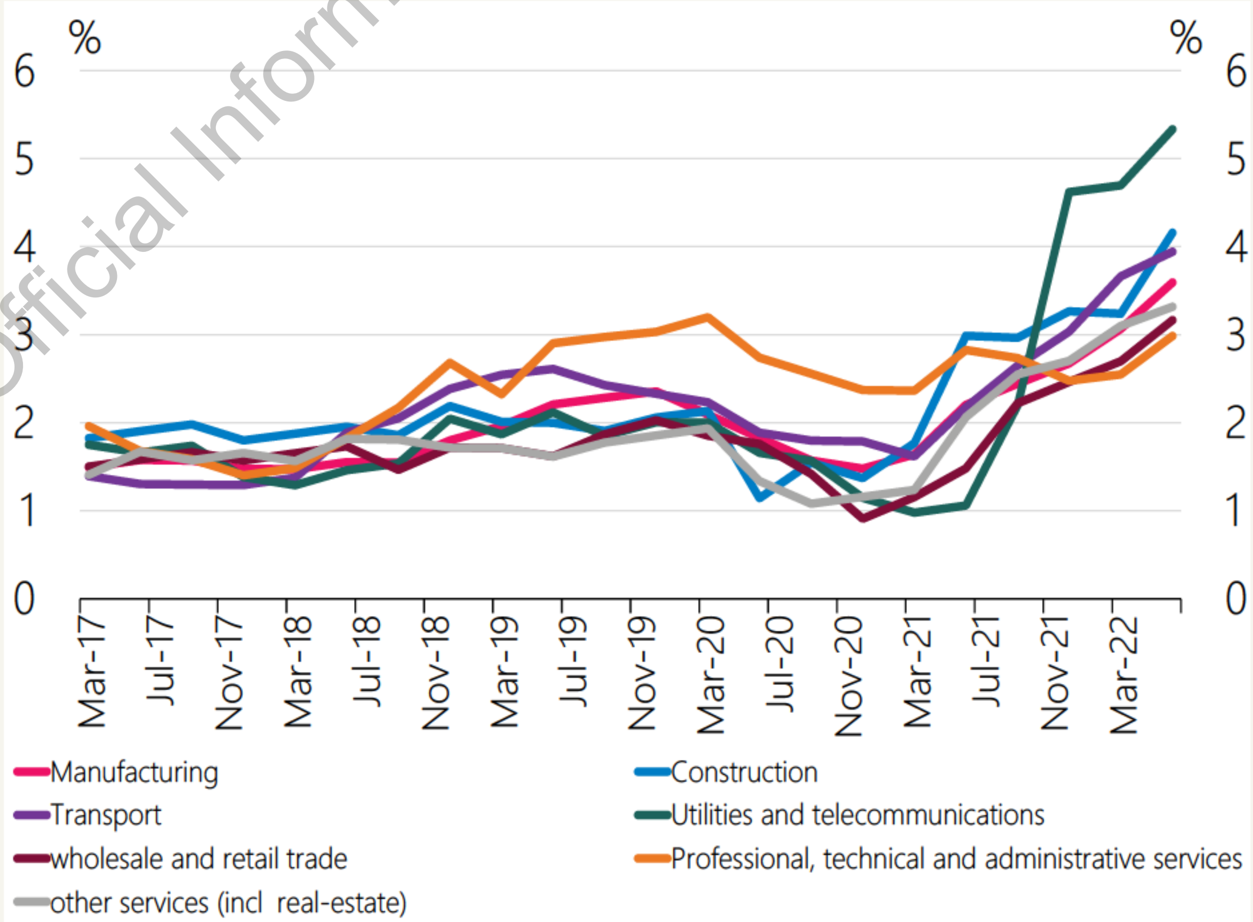


…but cost pressures are squeezing incomes…

QSBO expected costs and profitability

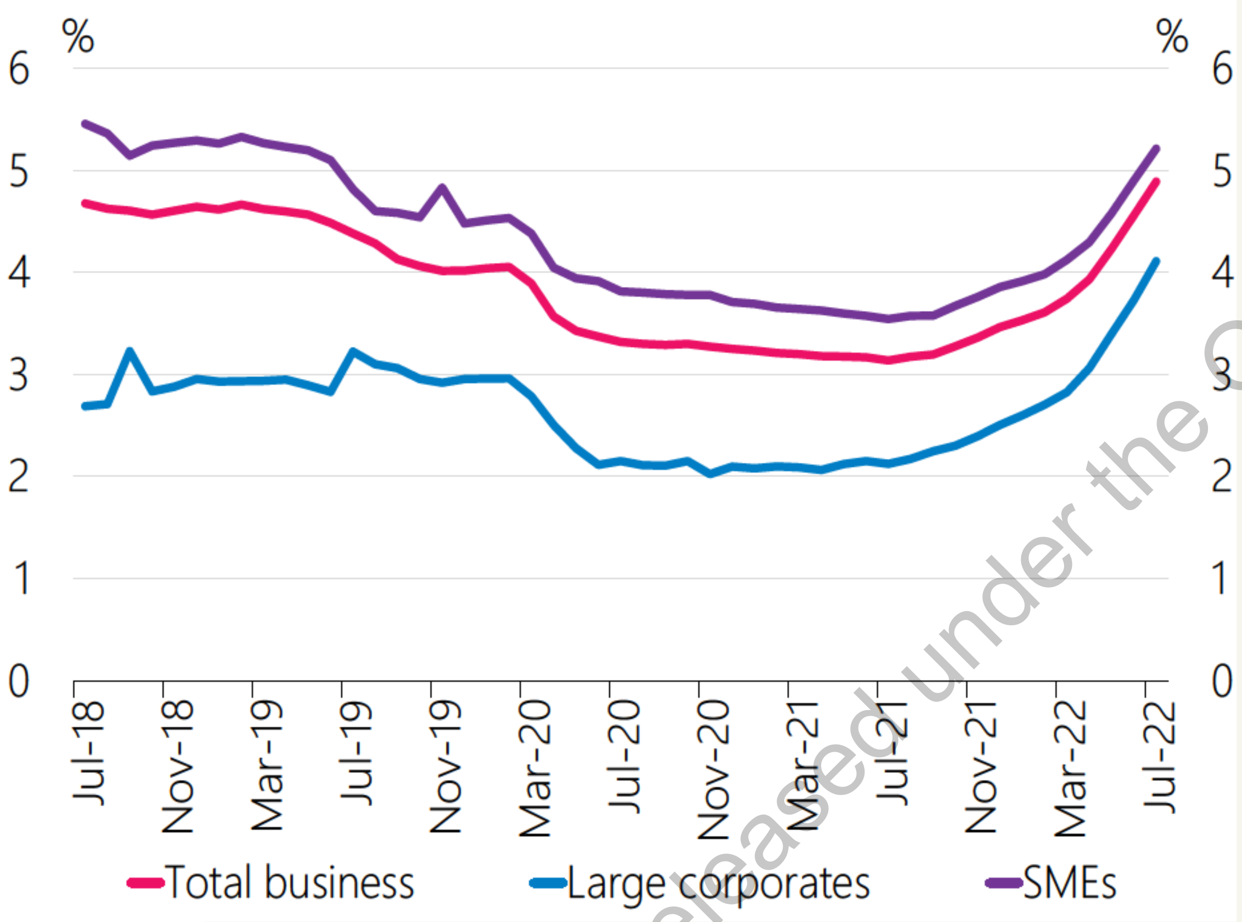


Labour cost index annual % change

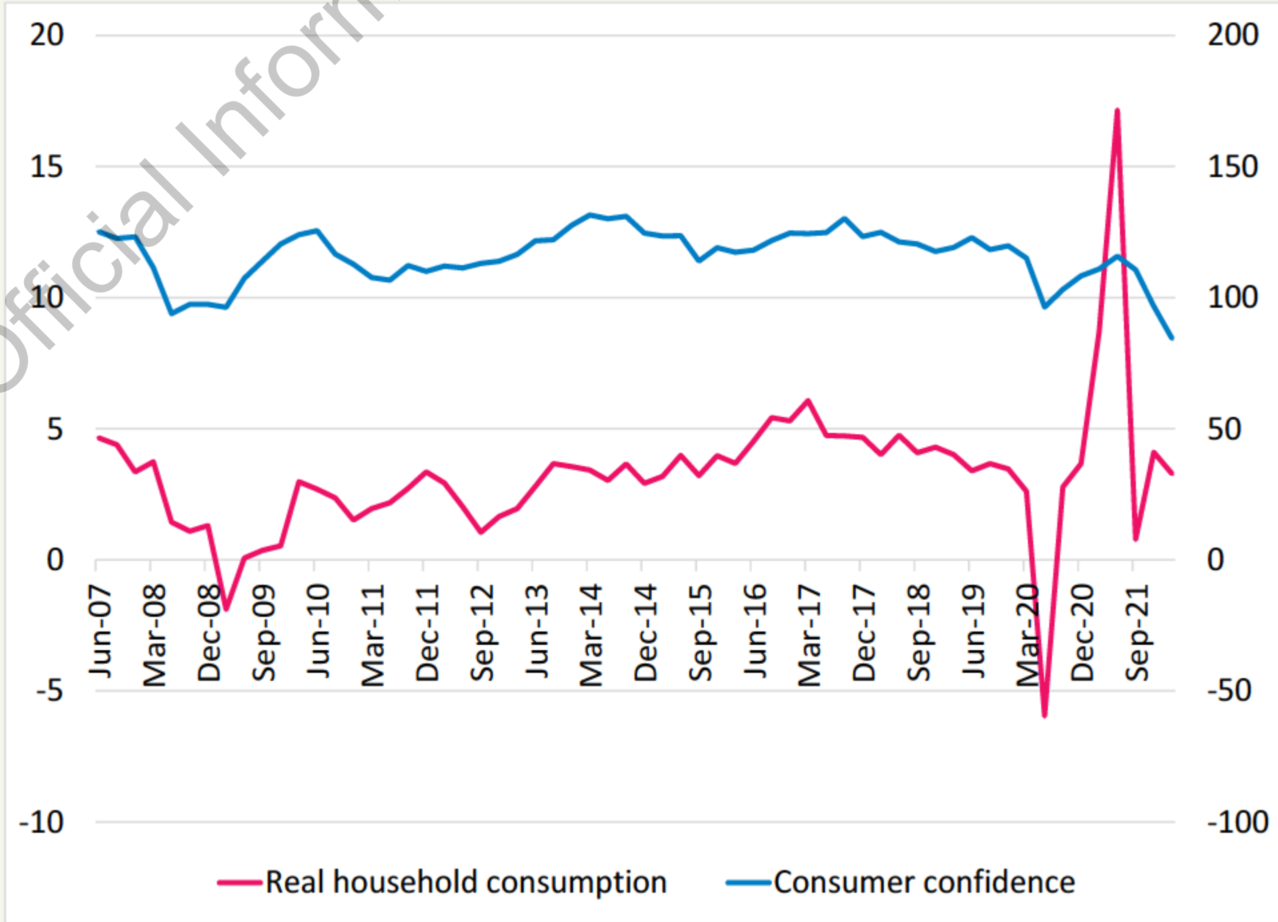


…amid higher interest rates & macro uncertainty

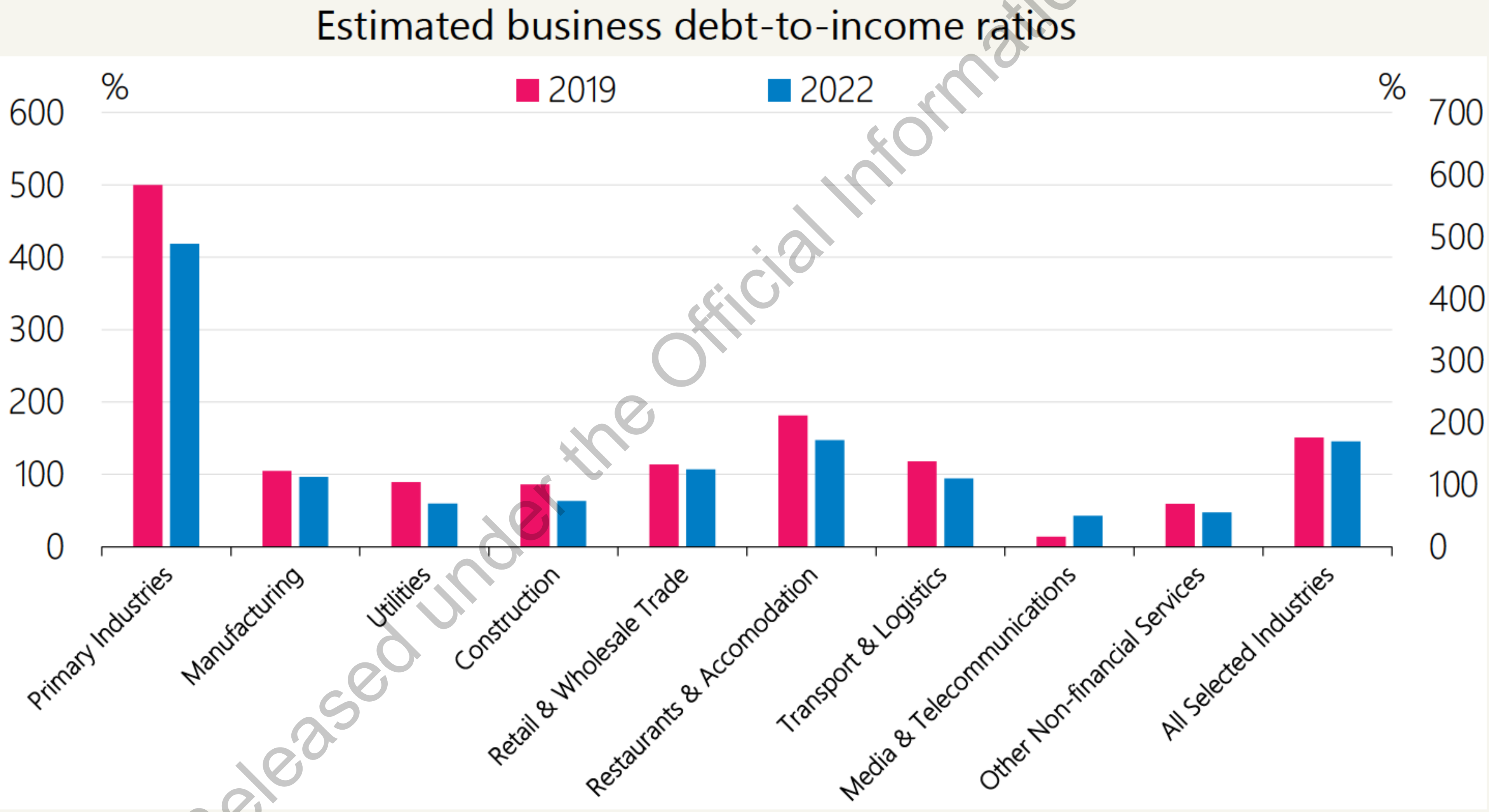
Bank yields on business lending



Consumer confidence and spending

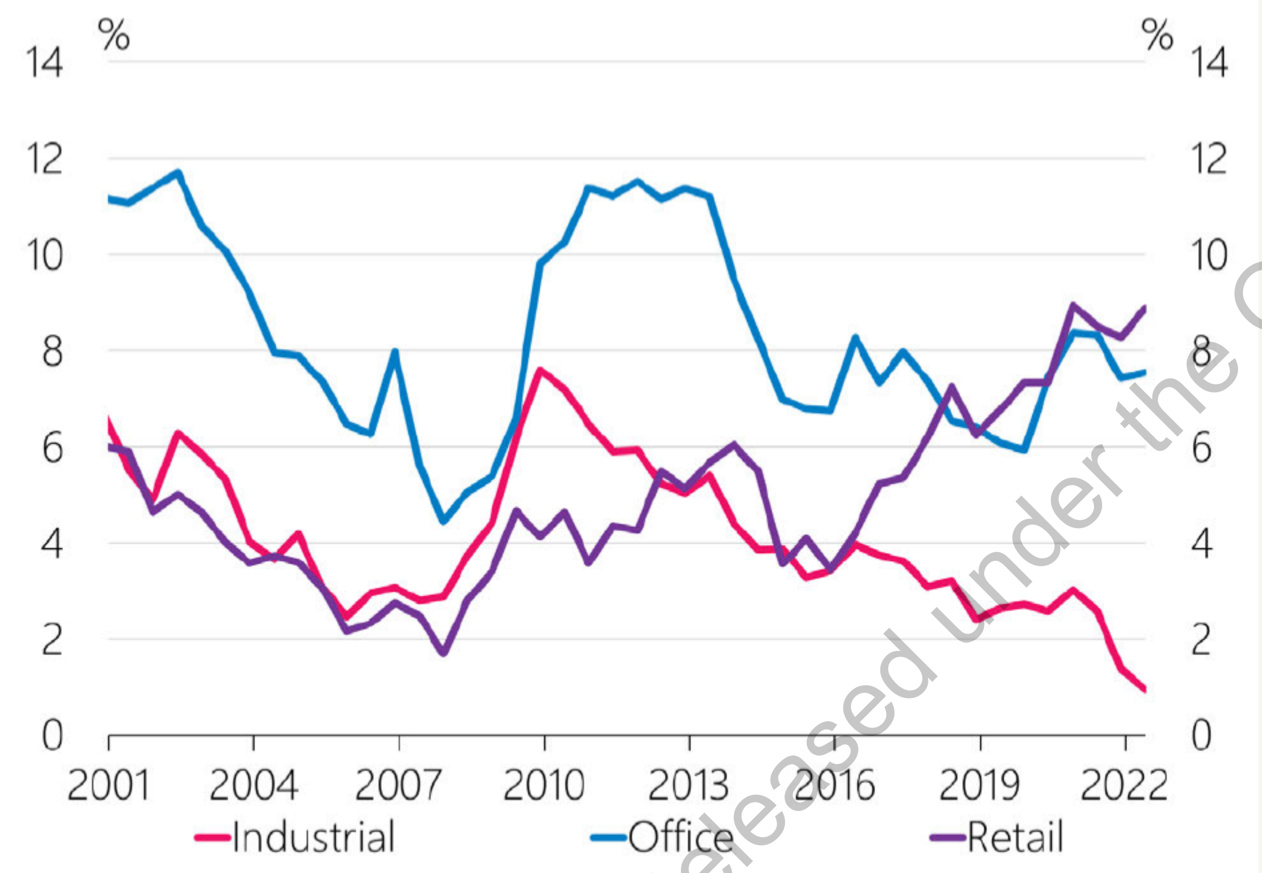


Business balance sheets improved since 2019

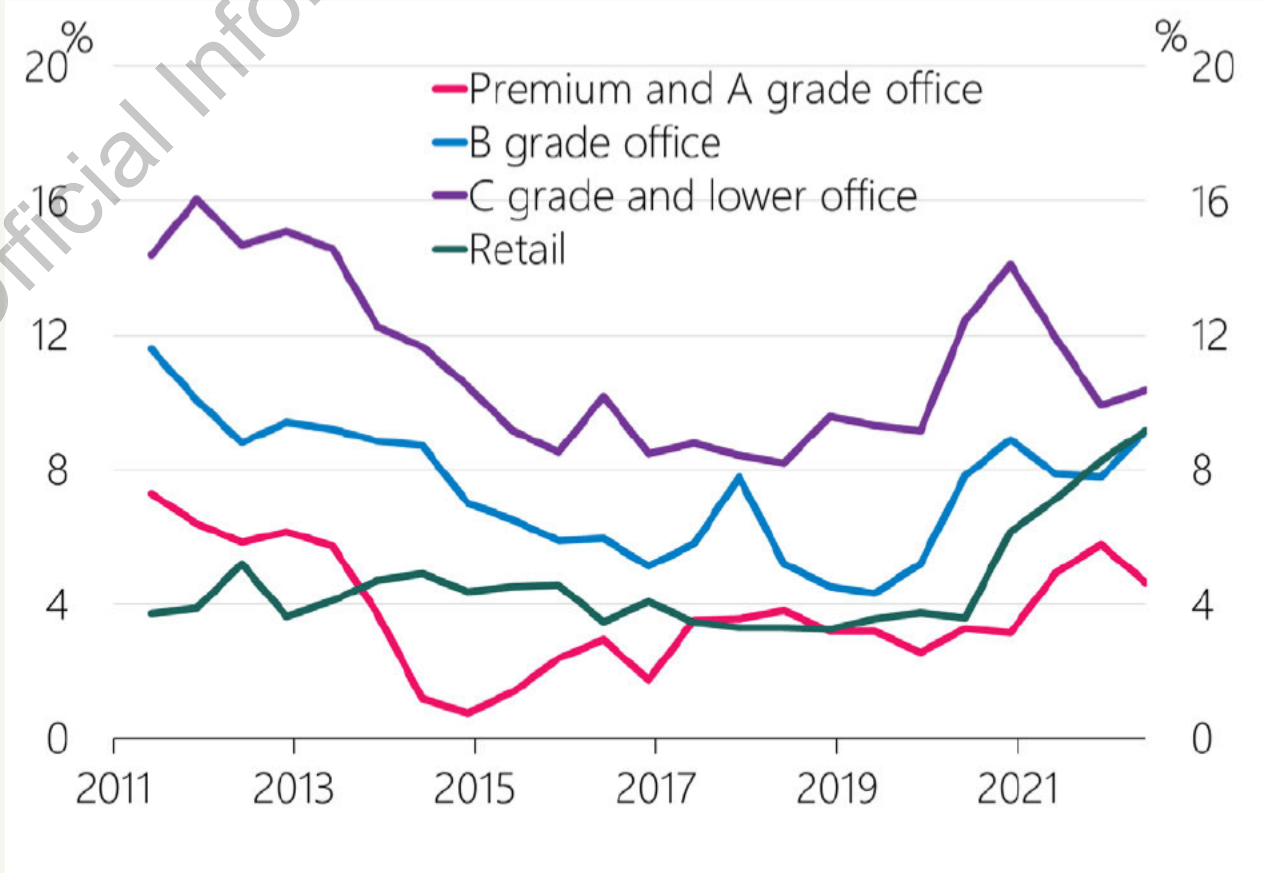


Commercial property mixed – lower quality retail and offices more at risk

CRE vacancy rates by sector



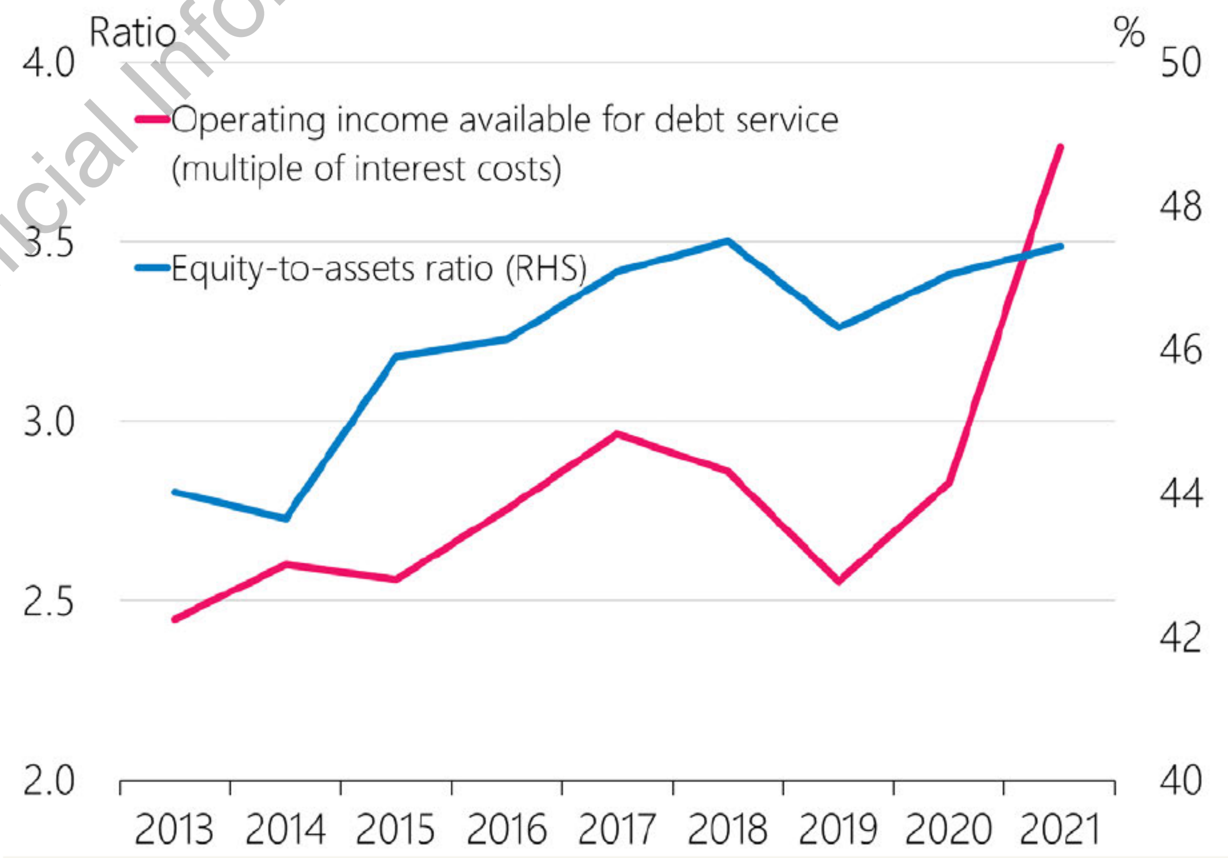
Vacancy rates for Auckland and Wellington CBD



Lending growth and resilience remain high, but until when?

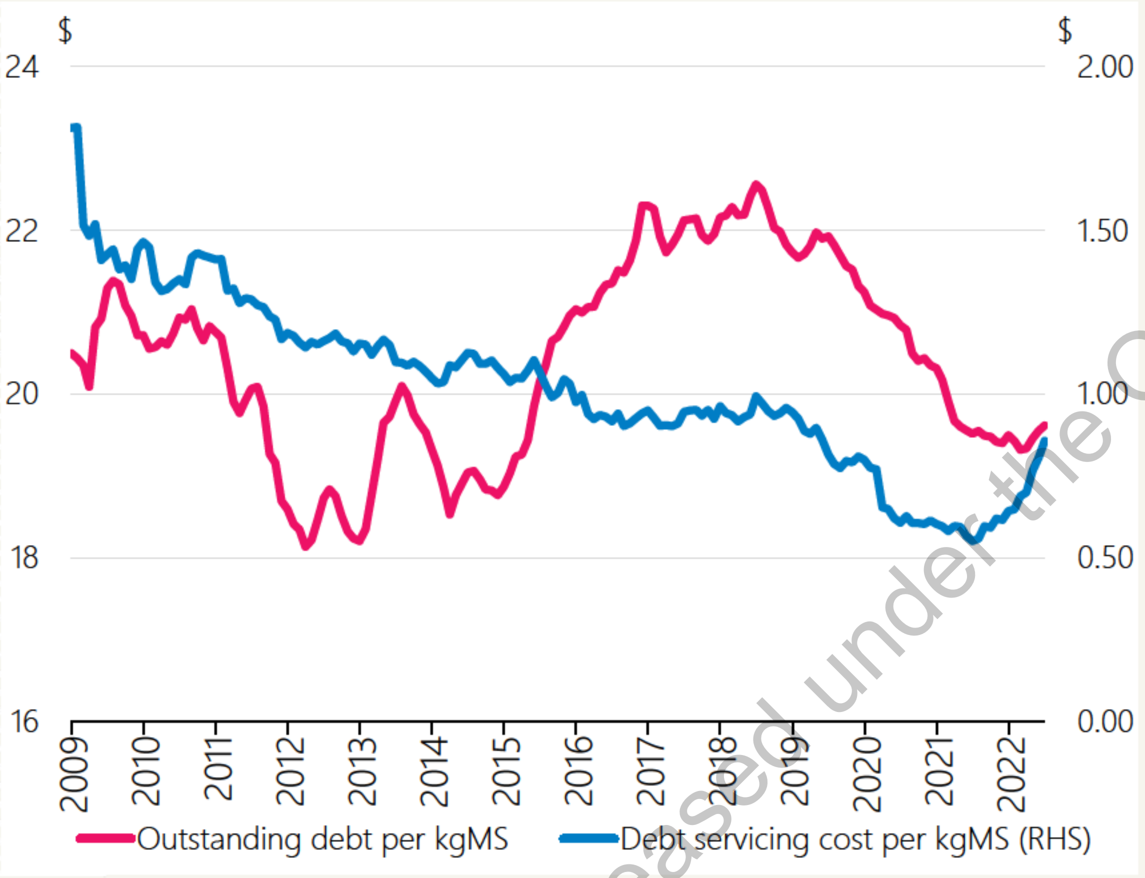
CRE lending - NPL and potentially stressed ratios

Interest coverage and equity-to-asset ratios

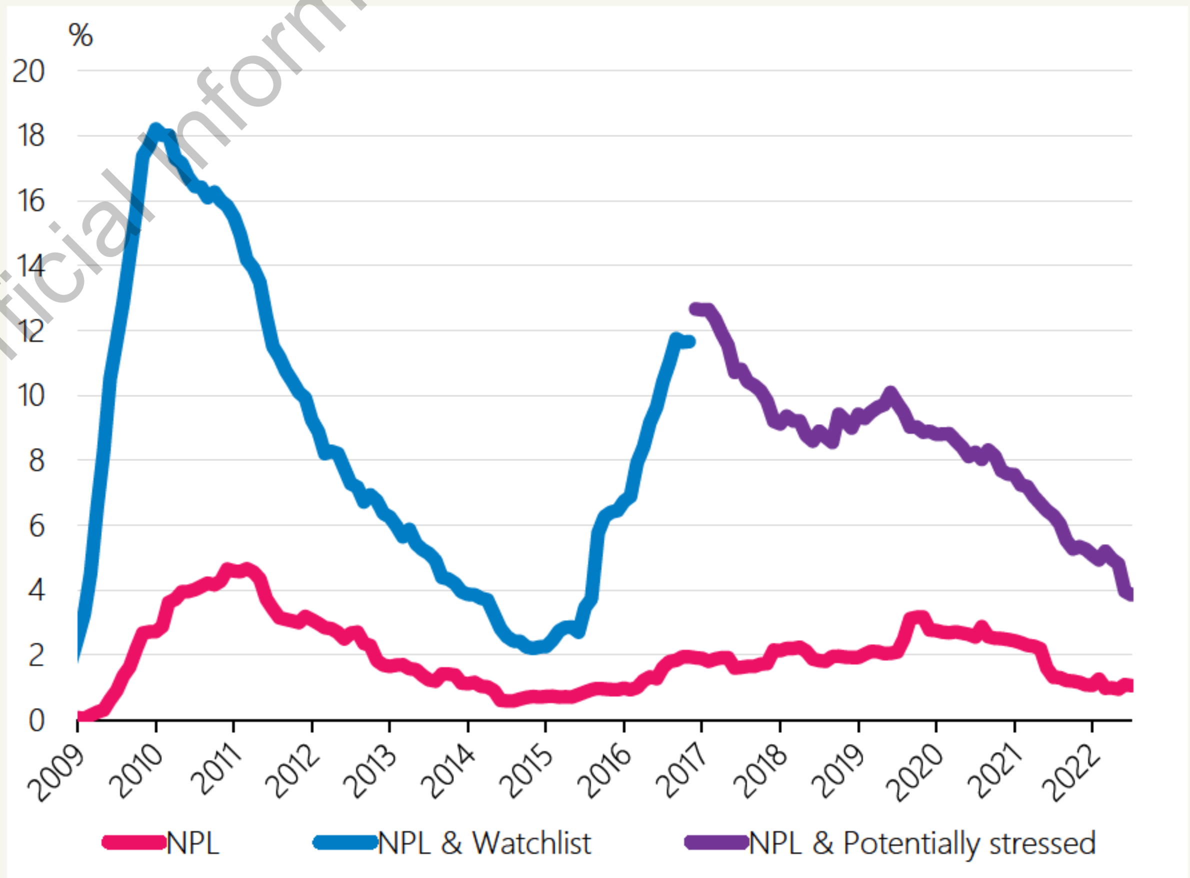


Dairy debt servicing costs have picked up, but banks yet to see stress...

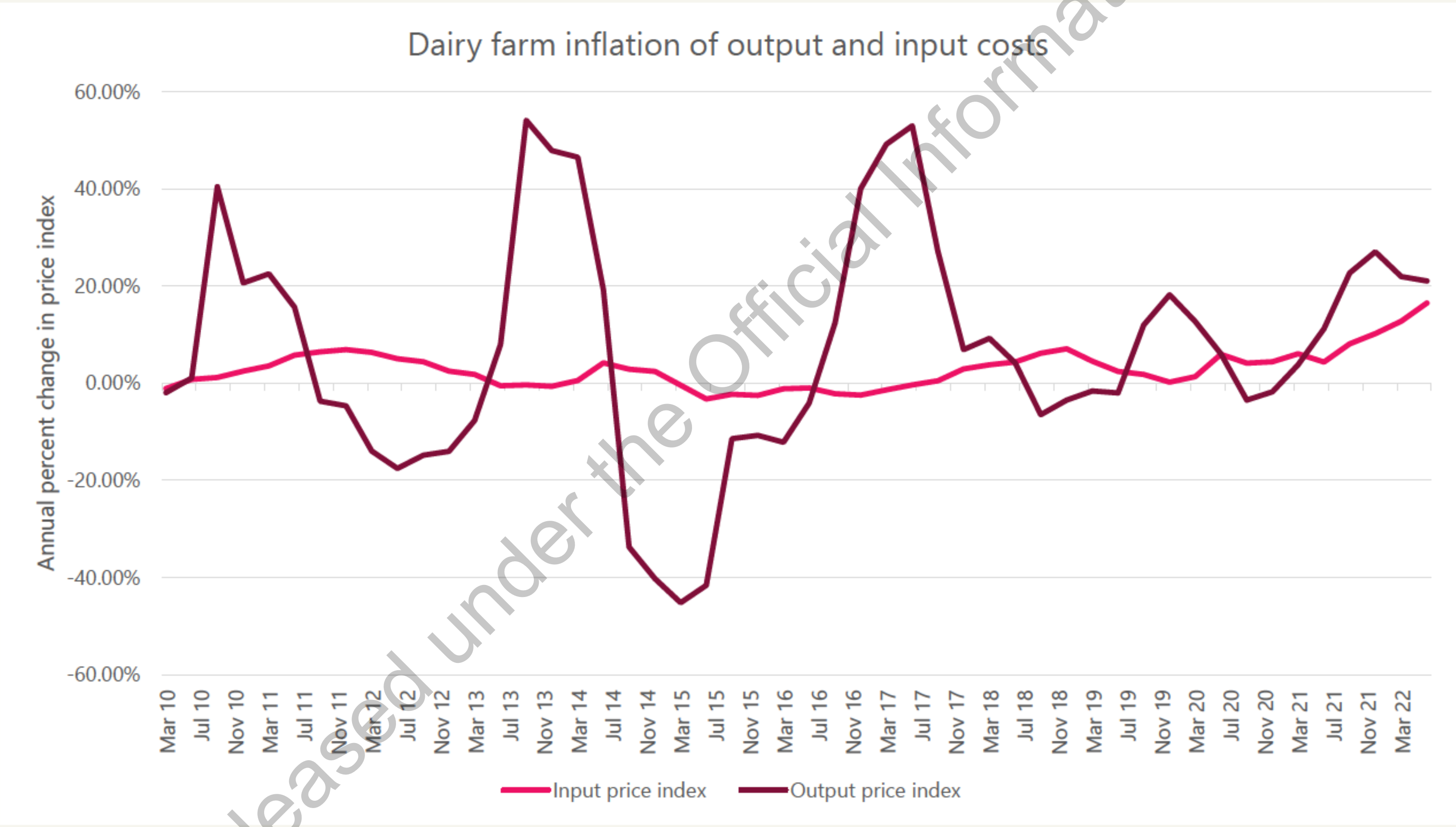
Debt and debt servicing costs per kgMS



Dairy stressed and potentially stressed loans



… as farmers are supported by favourable commodity prices and exchange rate, albeit upward cost pressures



Wrap-up

Vulnerabilities assessment

Category	Vulnerability Level	Vulnerability Trend	Comment
Asset price valuations		⇘	Rising interest rates have contributed to price falls across a broad range of asset classes. New Zealand house prices are currently closer to, but still well above our assessment of their sustainable level.
Household balance sheets		⇒	Mortgage rates have risen faster than previously expected, and are approaching the levels at which 2020/2021 borrowers were stress tested. Buyers in late 2021 in some regions are now in negative equity, with potential for significant rise if prices continue current downward trend. Offsetting this, the riskiness of new lending has declined, on average, and the strong labour market supports servicing capacity.
Business balance sheets		⇒	High inflation, tight labour markets, and ongoing supply chain issues are creating a difficult operating environment, squeezing margins in some sectors. Commercial property and construction remain vulnerable. However, businesses are well placed to handle higher interest rates given deleveraging in recent years (dairy in particular).
Institutional resilience		⇘	Bank profitability is high and capital levels continue to increase. Banks are yet to see any deterioration in asset quality.
Liquidity and funding		⇒	Banks have sufficient core funding given the outlook for credit growth. The average duration of deposit funding will increase as FLP winds down.

	Low		Medium
	Moderate		High

⇗	Increasing
⇒	Steady
⇘	Decreasing

Reserve Bank of New Zealand Te Pūtea Matua

Board Paper 2.3

From	Charles Lilly, Adviser; Chris McDonald, Manager Financial System Analysis; Financial Stability Group
Approved by	Christian Hawkesby, AG/GM Financial Stability Group
Date	19 October 2022
Subject	Key themes for the November 2022 Financial Stability Report
Value(s)	Inclusion/Taura
For	Review

Purpose

This paper provides the Board with the opportunity to give feedback on the intended content of the next *Financial Stability Report* (FSR), which will be released on 2nd November. The paper outlines the purpose and production process for the FSR, and the key themes we are intending to focus on for this round. A draft of Chapter 1 (as of 4th October) is in the appendix.

Recommendations

The Board:

1. **Reviews** the proposed key themes and draft of Chapter 1 for the November *Financial Stability Report*, and provides any feedback.

2. **Notes** that the Board will be provided with a typeset version of the November *Financial Stability Report* via email on Tuesday 25th October, for final review and approval by resolution on Friday 28th October to release the FSR to the Minister of Finance and for publication.

Report

Background

The *Financial Stability Report* (FSR) is one of the Bank's flagship publications, reporting on developments in New Zealand's financial system and risks to financial stability. We are required under the RBNZ Act to release an FSR twice a year.

Sections 169-170 of the RBNZ Act set out that the FSR should:

- provide publically accessible information on the stability of New Zealand's financial system, to promote public awareness and understanding;
- identify and report on risks to the stability of New Zealand's financial system; and
- allow an assessment to be made on the effectiveness of the Bank's use of its powers to protect and promote the stability of the financial system.

As a comparison, the *Monetary Policy Statement*, published four times a year, outlines the Monetary Policy Committee's assessment of the current economic environment, the outlook for the economy, and how the Committee intends to use its monetary policy tools to achieve low and stable inflation and maximum sustainable employment. The FSR on the other hand focusses on the vulnerabilities of the financial system, a range of potential adverse developments that could threaten financial stability, and our assessment of how resilient the system is to these risks. In addition, the FSR reports on other aspects of our financial stability objective we have regard to (such as efficiency and inclusion), and outlines the actions we are taking, including prudential policy developments and supervisory activities.

Production of the FSR is led by the Financial System Analysis team in the Financial Stability Group (FSG), with input from teams across FSG and the Money Group.

The next FSR will be released on 2nd November 2022.

The FSR has a potentially wide audience ranging from parliament, regulated entities, industry analysts, and the public. We seek to target and tailor content and messages to these various audiences. The media release and chapter 1 of the document are targeted at media and therefore indirectly at the public. The full detailed FSR document is targeted at industry. We produce a plain language summary which is published on our website for general consumption. For this round we are also planning a number of information releases (e.g. webinars) during publication week for those interested in more details of some of the topics covered in the FSR.

Outline of Board involvement in November 2022 FSR

With the new Board structure in place for the first time this FSR round, we have sought to provide the Board with opportunities to contribute to the FSR's development, and sign-off of the final FSR, as follows:

Wed 19th October	Board meeting: Board receives key messages and draft of Chapter 1 of the FSR (summary and key findings), for feedback.
Tue 25th October	A near-final typeset copy of the FSR, plus press release, distributed via email for review (2pm). This version is near-final in terms of content, but subject to minor proofreading and confirmation/update of data and charts.
Fri 28th October	Board sign-off of FSR by approving a resolution to release the FSR to the Minister of Finance and for publication (subject to any specified changes).
Mon 31st October	Embargoed final FSR sent to Minister of Finance.
Wed 2nd November	FSR released at 9am.

FSR analytical framework and contents.

We have a standard framework for undertaking a six-monthly assessment of financial stability in preparation for the FSR. This includes assessments of key financial stability vulnerabilities such as the macro-economic environment, asset quality on banks' balance sheets and the strength of households and businesses' balance sheets. We also provide an overview of our work in building the resilience of the financial system including our regulatory policy initiatives and actions. The FSR reflects a point-in-time assessment of financial stability risks and vulnerabilities. We seek to supplement this by looking at some of the longer term trends and issues through the inclusion of special topics, for example in boxes. The contents of the FSR reflects this framework, namely:

Chapter 1: Financial stability risk and policy assessment (a summary of our assessment and key findings – see Appendix 1)

Chapter 2: Asset prices, households and businesses

Chapter 3: New Zealand's financial institutions

Chapter 4: Regulatory initiatives

Chapter 5: Regulatory compliance and enforcement

For the November 2022 round, we are including the following boxes:

Box A: The Reserve Bank's Financial Policy Remit

Box B: Implications from a slowdown in Chinese growth

Box C: Impacts of flooding due to climate change on residential mortgages

Box D: Recent lending growth by non-banks

Key themes for November 2022 FSR

The key developments highlighted in the November FSR are the increase in interest rates seen since late 2021, the decline in New Zealand house prices, and the deterioration in the outlook for global economic growth. Despite these challenges ahead, we assess the resilience of the financial system as high.

Our summary of the key themes for this round of the FSR is as follows:

- While the challenges of the COVID-19 pandemic and global supply chain issues of recent years are lessening, strong and broadening inflationary pressures are leading central banks to tighten monetary policy more aggressively than had previously been anticipated.
- There is an increasing likelihood that the global economy will slow considerably over the next year. Central banks have a difficult task of balancing the right amount by which to raise interest rates to tame inflation, without causing an unnecessarily large slowdown in economic activity and rise in unemployment.
- House prices in New Zealand continue to decline as mortgage rates rise, with prices down 9 percent nationally since their November 2021 peak, and larger falls in Wellington and Auckland. We continue to assess house prices as being above a sustainable level.
- The number of households in negative equity and/or unable to make their repayments (debt servicing stress) remain low to date, but could grow as house prices continue to fall and as borrowers' mortgage repayments increase in line with higher interest rates.
- Higher unemployment would lead to further stresses among households, and is a key risk to the housing market and households' overall debt servicing ability.
- Rising mortgage repayments and declining household wealth are likely to limit households' consumption spending over the next year.
- The current conditions in the housing market mean new residential construction is likely to slow considerably once existing development projects are completed.
- Businesses in most industries have reduced their financial vulnerabilities in recent years, which will limit stresses as their borrowing costs increase and demand in the economy slows.
- Despite these challenges, New Zealand's financial system is well placed to support the economy.
- Banks' capital and liquidity positions are strong, and profitability and lending quality remain high. Recent stress tests demonstrate banks' resilience to scenarios involving rising unemployment and interest rates, and declining house prices.
- Financial institutions need to take a long-term perspective in the face of the current economic uncertainties, making prudent lending decisions while supporting customers' ongoing access to credit.

Included in Appendix 1 is a full draft of Chapter 1 of the November FSR, as of 4th October, which expands on these key themes. Chapter 1 is our overarching assessment of the current state of risks to financial stability.

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Checklist for Author(s)

[Please complete and submit it with your ELT approved paper and appendices. Board Secretariat will save and remove the form after the Governor and *Chair's review and before uploading the document into the Board pack/Diligent.

*The Chair will on occasion review/approve papers, and this generally relates to papers that the Governor would like the Chair's review/approval before the full Board's consideration or for non-Executive Board papers that are sponsored by the Board/Chair].

Details	**Author(s): Charles Lilly, Chris McDonald** **ELT Approver: Christian Hawkesby** **Board Paper Title: Key themes for the November 2022 Financial Stability Report**	
1.	Plan sufficient time to meet the paper deadline (note this is a hard deadline) • Diarise sufficient time to draft the paper, have it peer reviewed, and legally reviewed by Legal (if required) • Diarise sufficient time for your ELT Approver to review & approve the paper.	☒ Completed
2.	Review the Delegations Framework (E.g. who makes decisions on the recommendations? E.g. If issuing an external document/letter to the Minister, who on ELT/Board will be authorised to sign the doc?) If unsure about the Delegations Framework, consult Legal.	☒ Reviewed and the Recommendations in the Board paper reflect this
3.	Director Interests and Conflict: Consult with your ELT Approver on Board Director(s) who have interests that conflict with parts or the whole paper (part = redacted those parts/whole =exclude the paper from that Director's Board pack). If unsure about the conflicts, consult the Board Secretary.	☒ Checked and confirmed no conflicts ☐ Checked, consulted and confirmed the following conflicts: **Board Director: [List]** What interest and conflict? Details: ☐ Whole – exclude the whole paper and attachments from the conflicted Director's Diligent pack ☐ Part document – separate redacted document(s) provided, and issue this paper and attachments in the conflicted Director's Diligent pack
4.	Advise the Board Secretary of the Director(s) conflicts	☐ Completed with notes in 3.
5.	Publication on the Vault after the Board meeting	☒ OK to publish the whole paper ☐ OK to publish part of the paper (sections to be redacted clearly marked as **[Commercially sensitive] OR [privacy related people information]**

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Document 13

Reserve Bank of New Zealand
Te Pūtea Matua

Household sector

Pre-FSR team discussion

September 2022

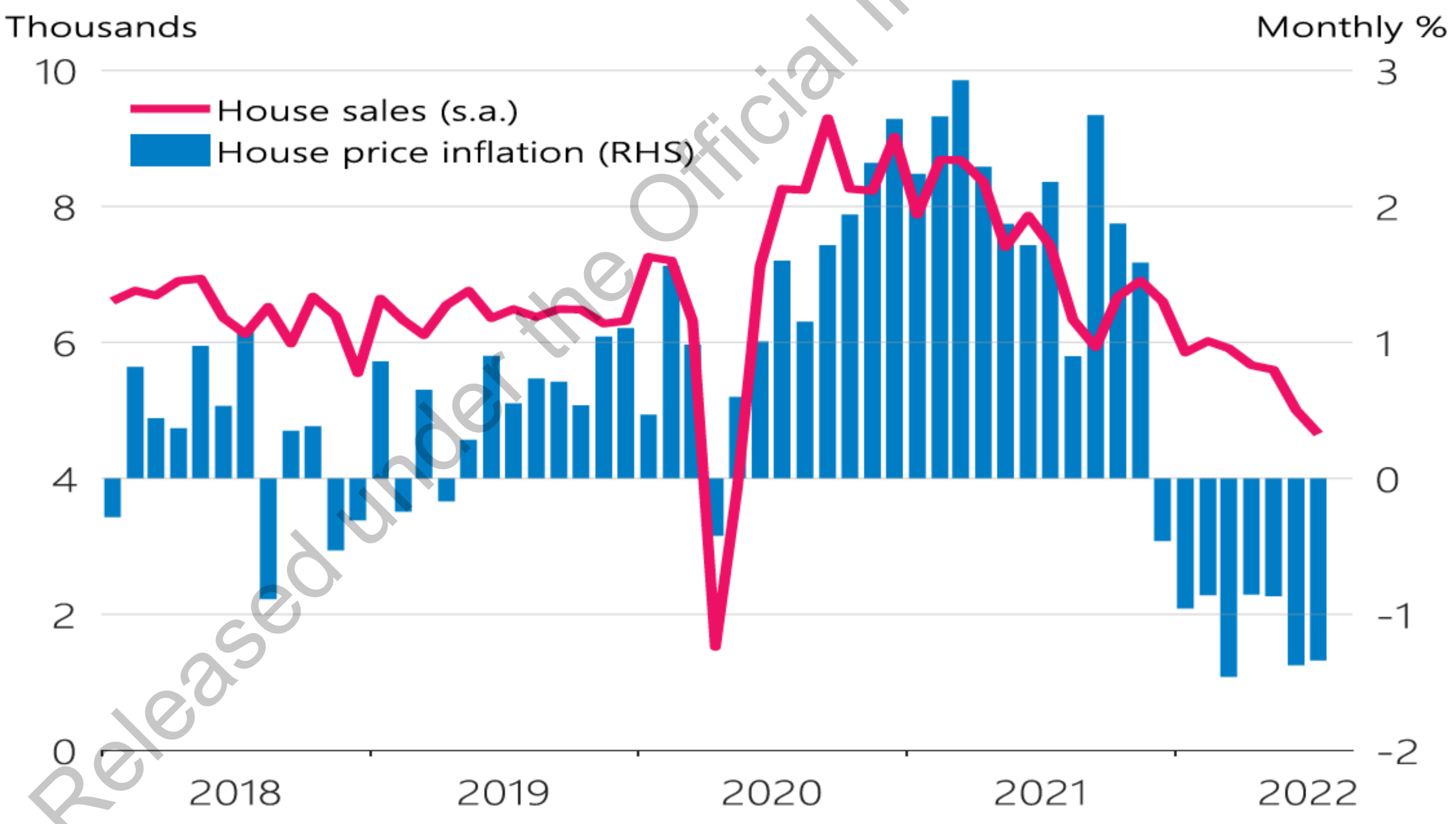
Overall narrative

- Housing market activity continues to soften.
- Housing demand weakened by rising interest rates, falling prices, LVRs and CCCFA.
- Housing supply constrained by collapse in pre-sales
- Interest rates have risen, but not fully passed through to borrowers
- Risky household borrowing has fallen sharply
- Resilience of recent borrowers to falling house prices has increased
- Rising rate could see some borrowers in serviceability stress
- Spillovers from falling house prices to real economy uncertain

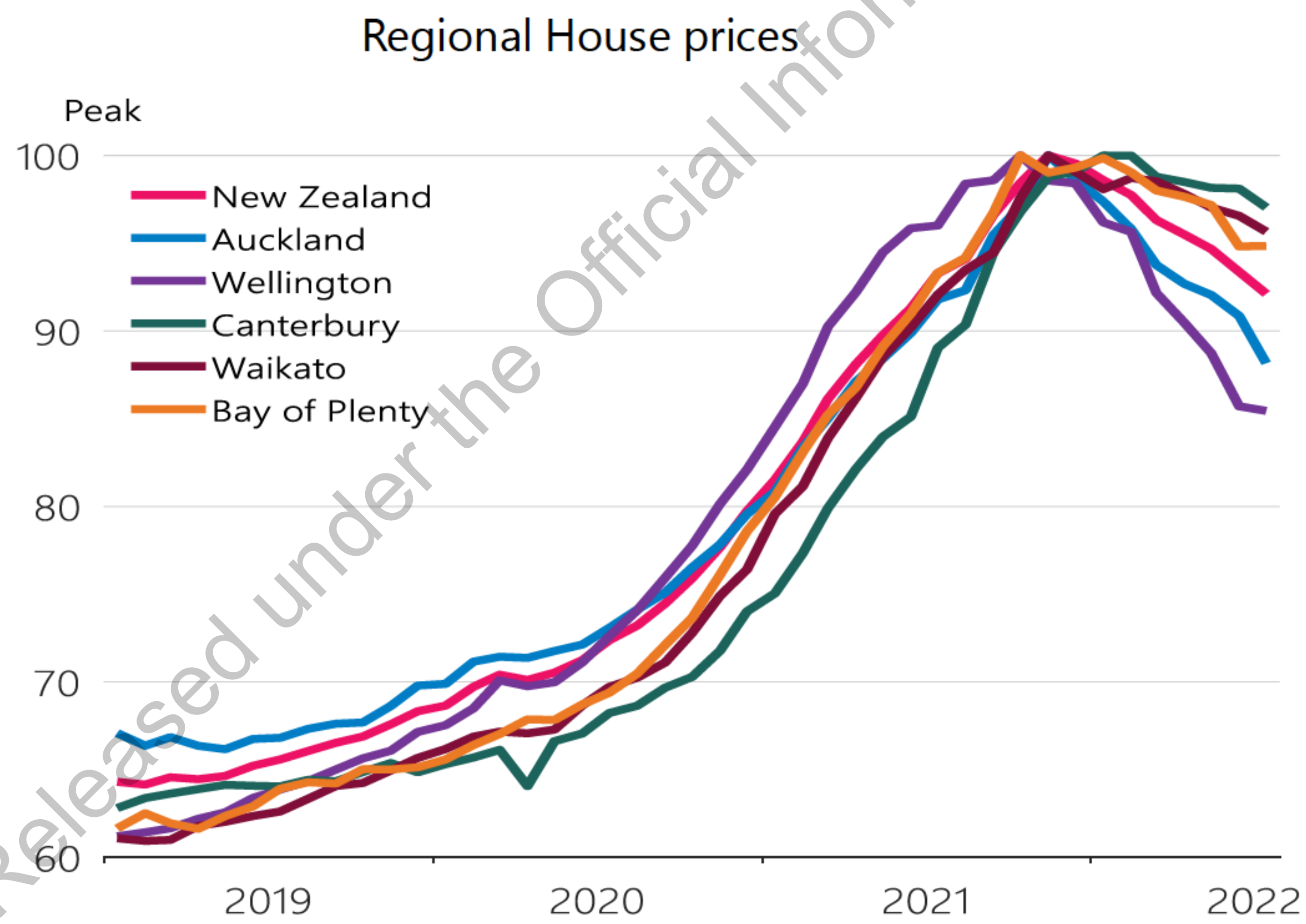
Housing market conditions

Housing market correction is continuing

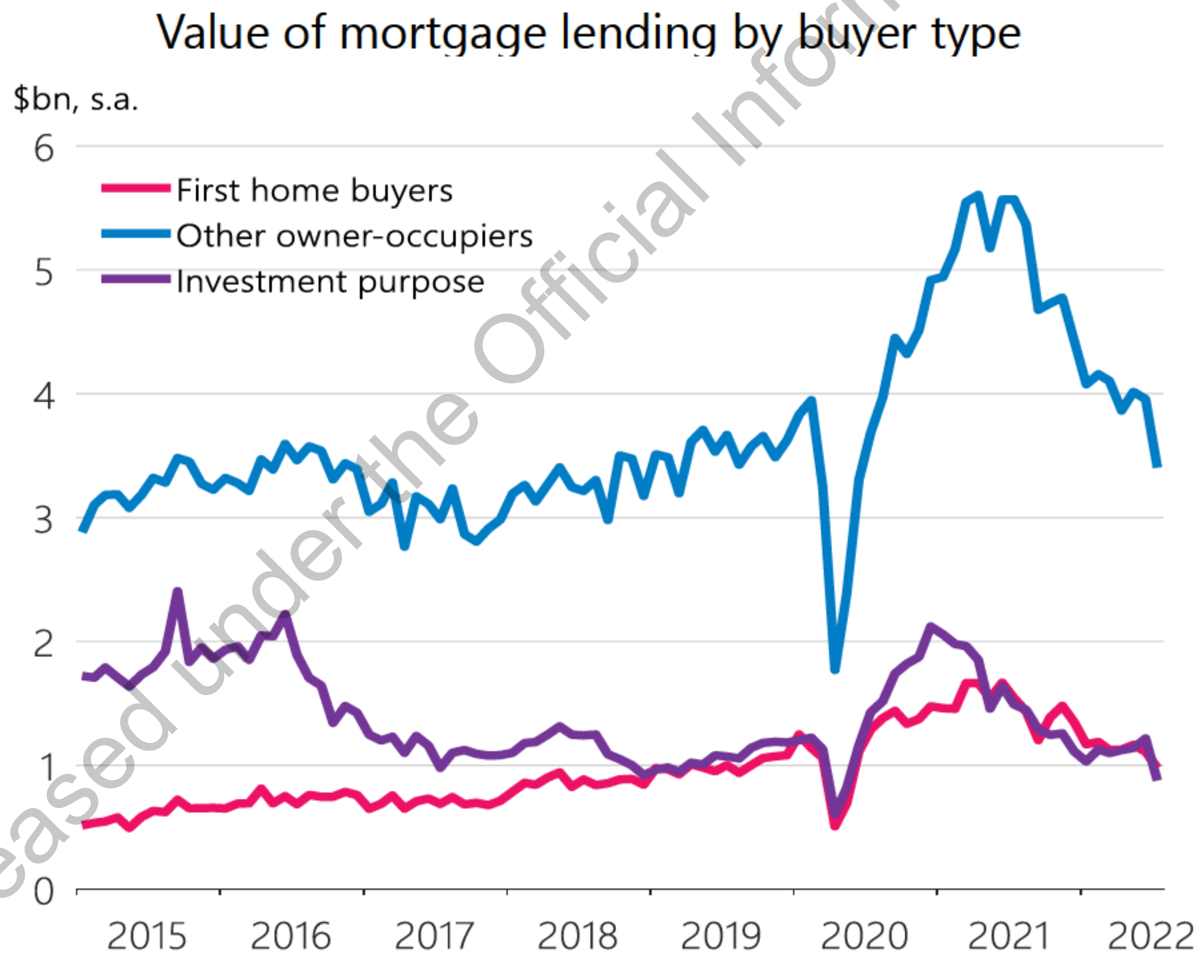
REINZ house prices and house sales



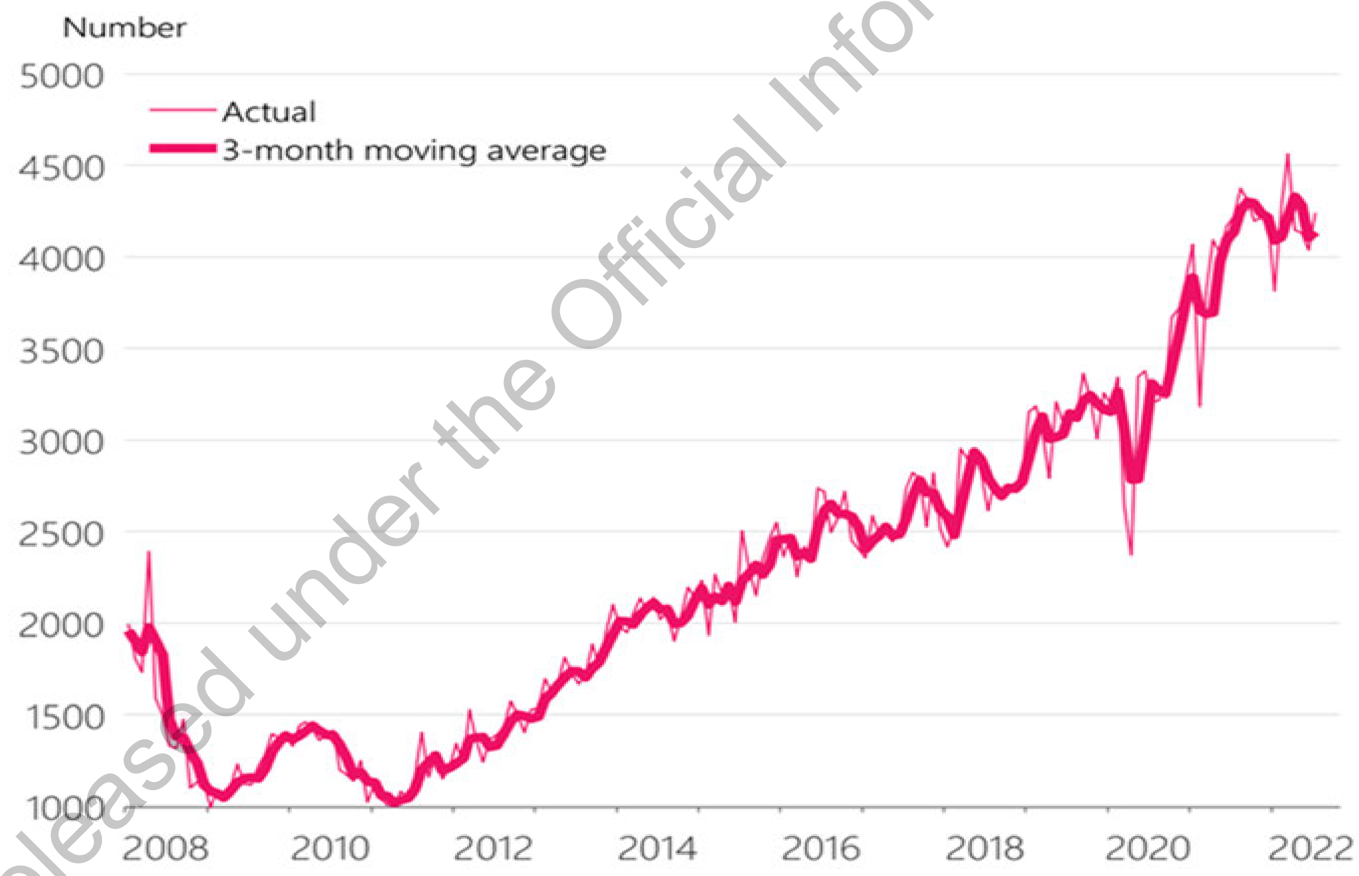
Largest price falls in Auckland and Wellington



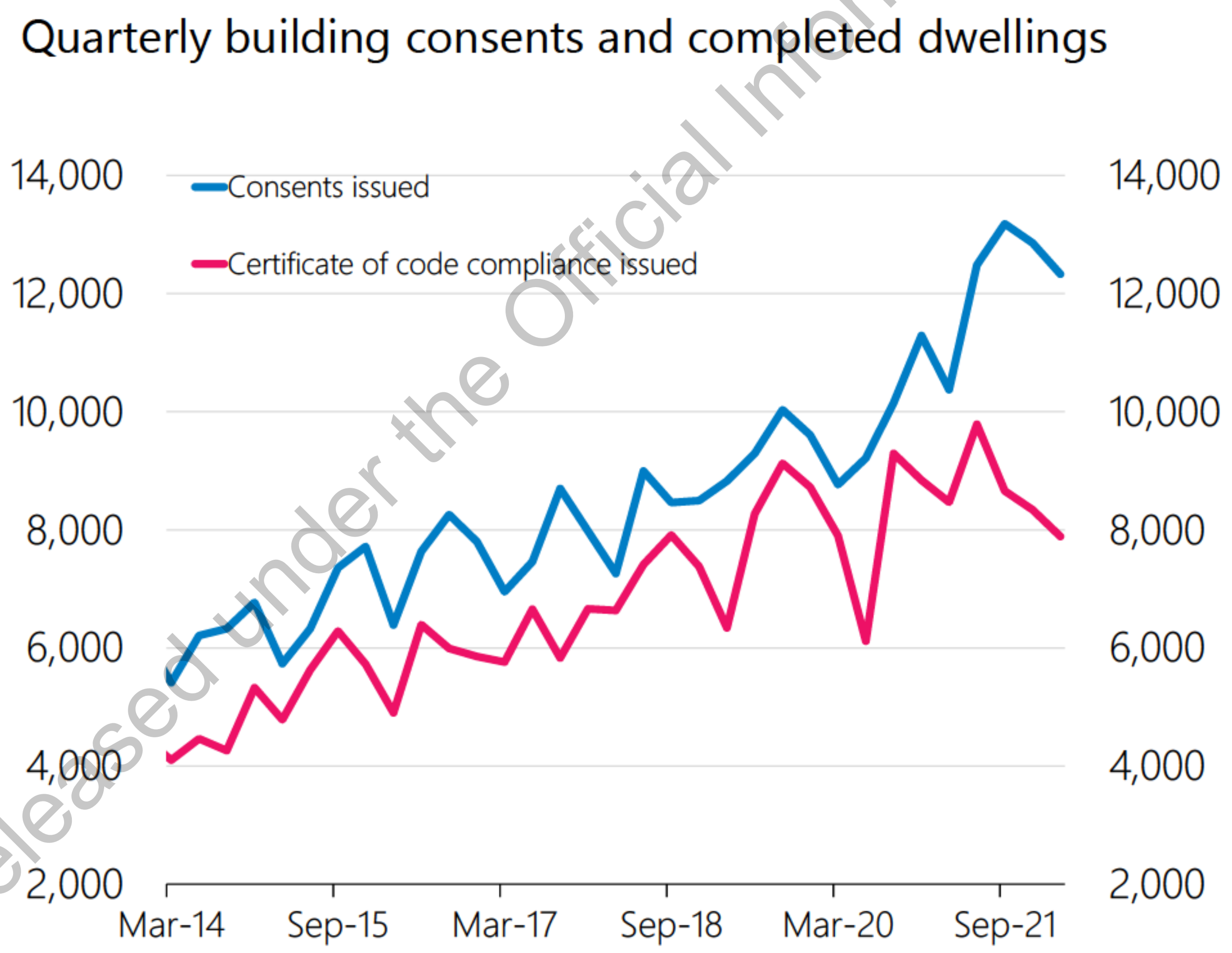
Lending growth is also slowing



Building consents remain strong...



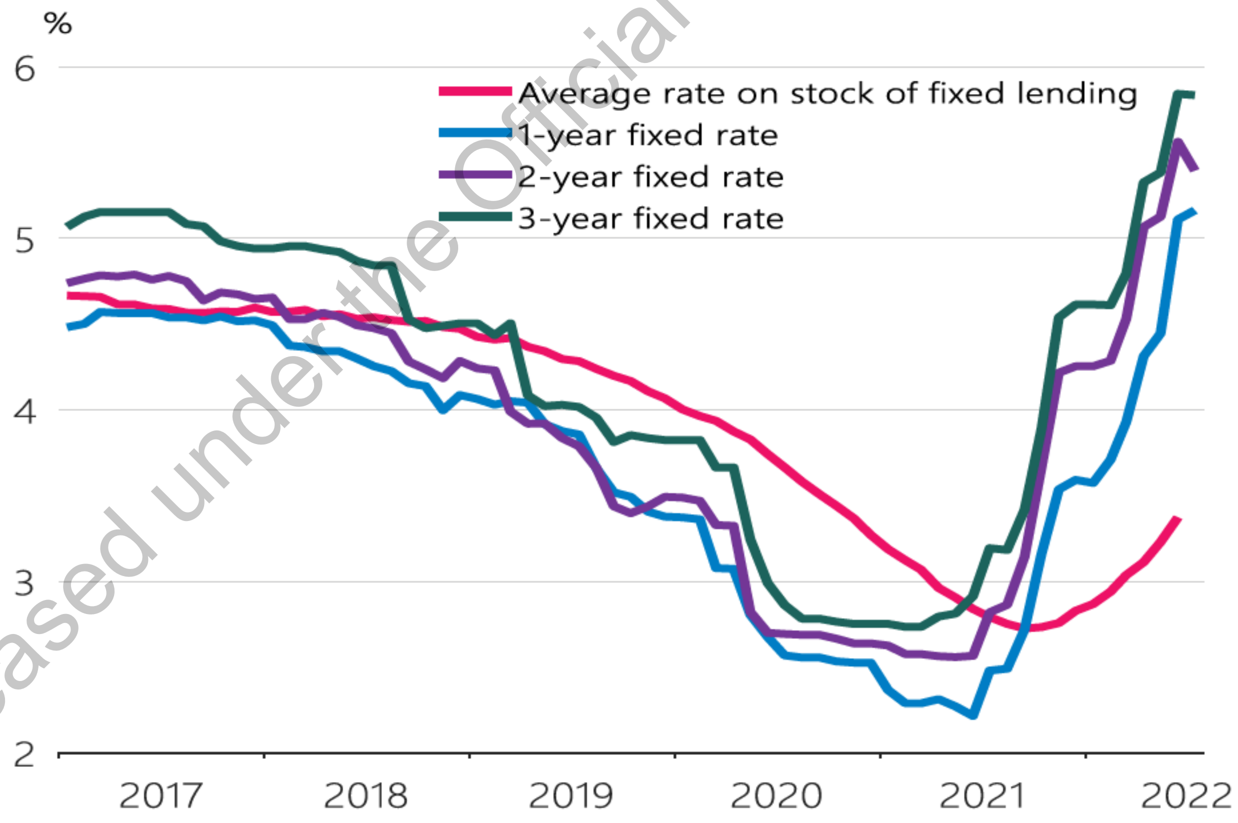
…but housing supply is constrained



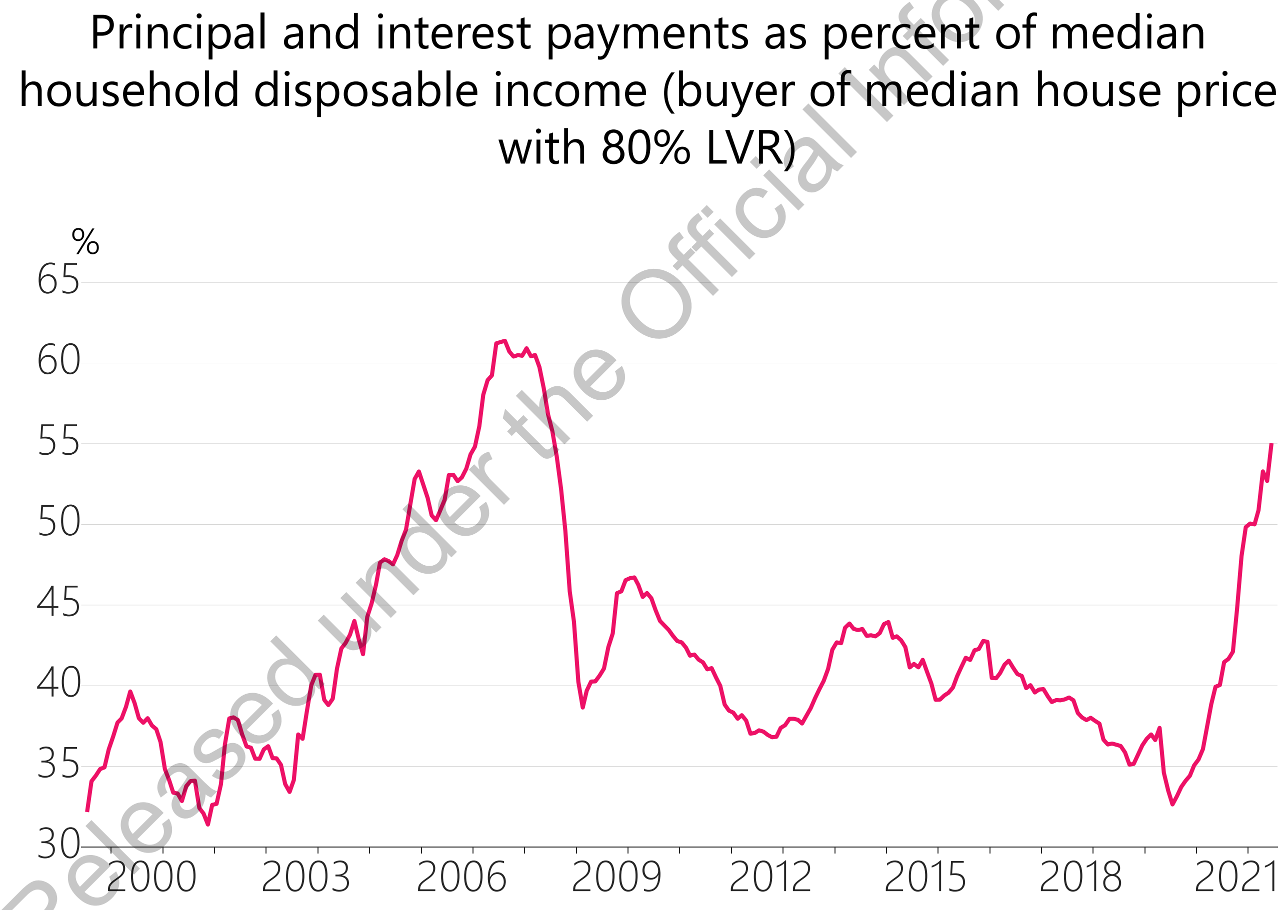
Rising interest rates

Mortgage rates have risen

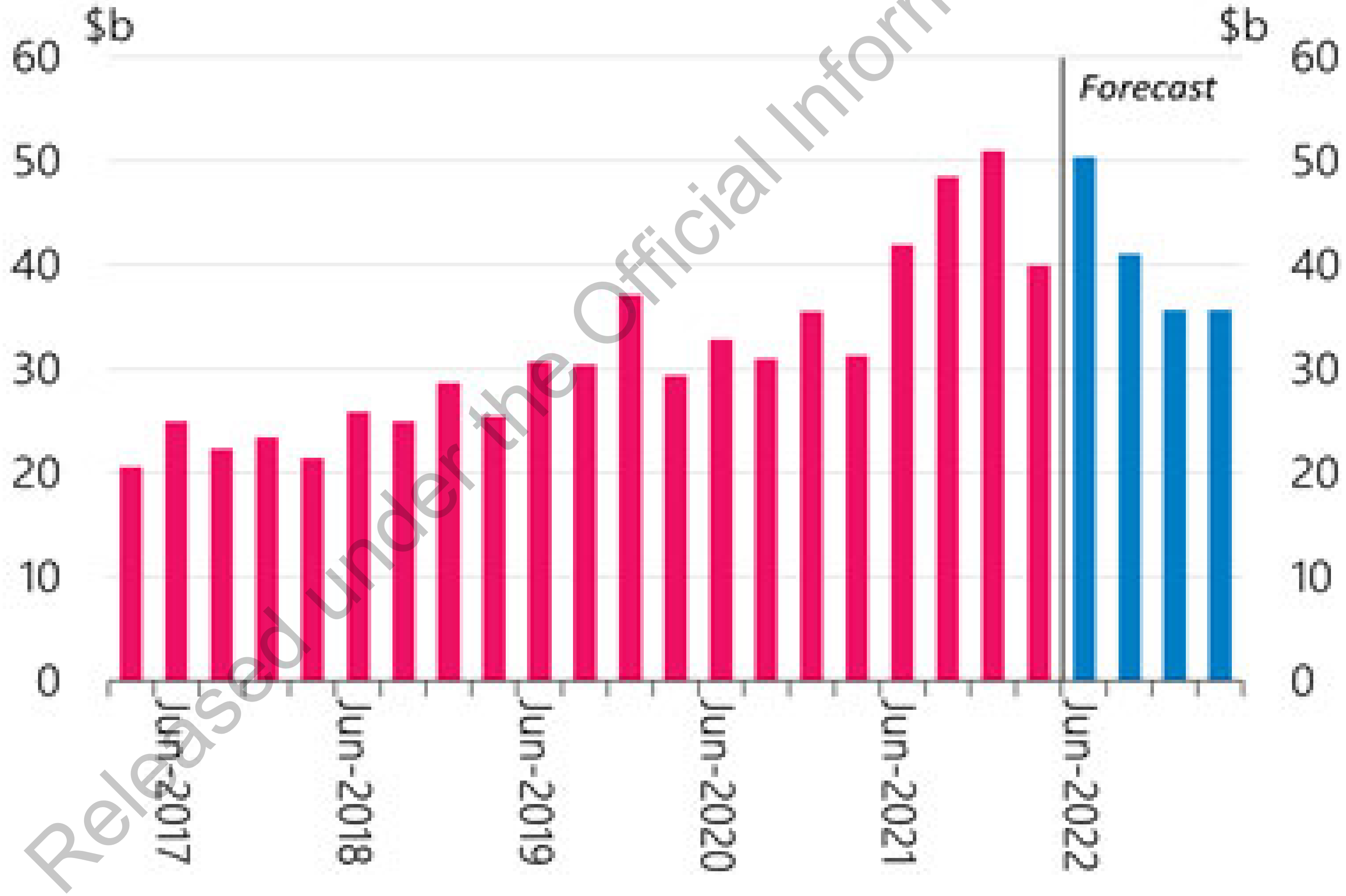
New fixed mortgage rates and average rate on existing fixed rate lending



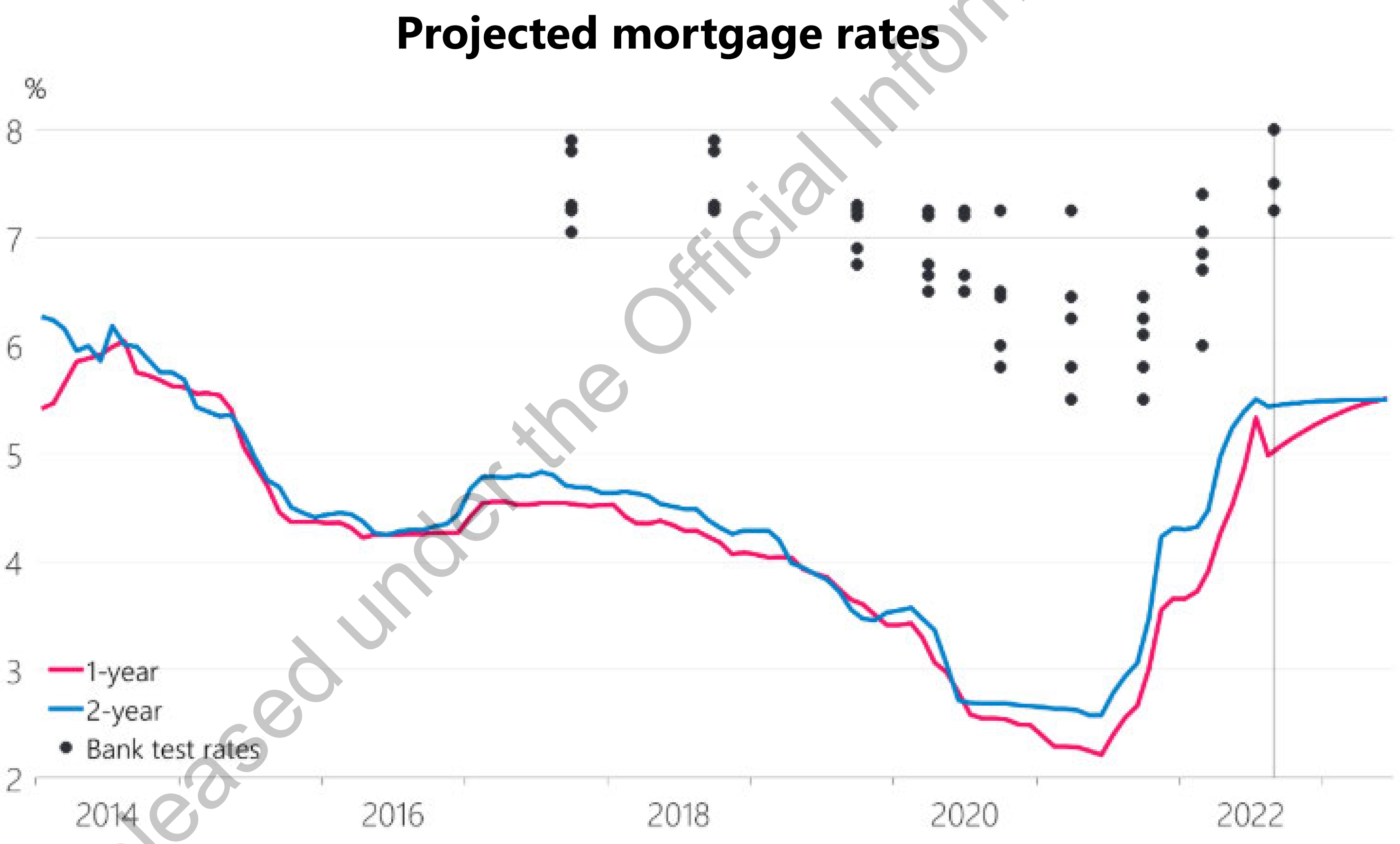
Pressure on mortgage payments continues to rise



During 2022, around 50% of the fixed rate mortgage stock will reprice



Rates may be near their peak



CCCFA changes

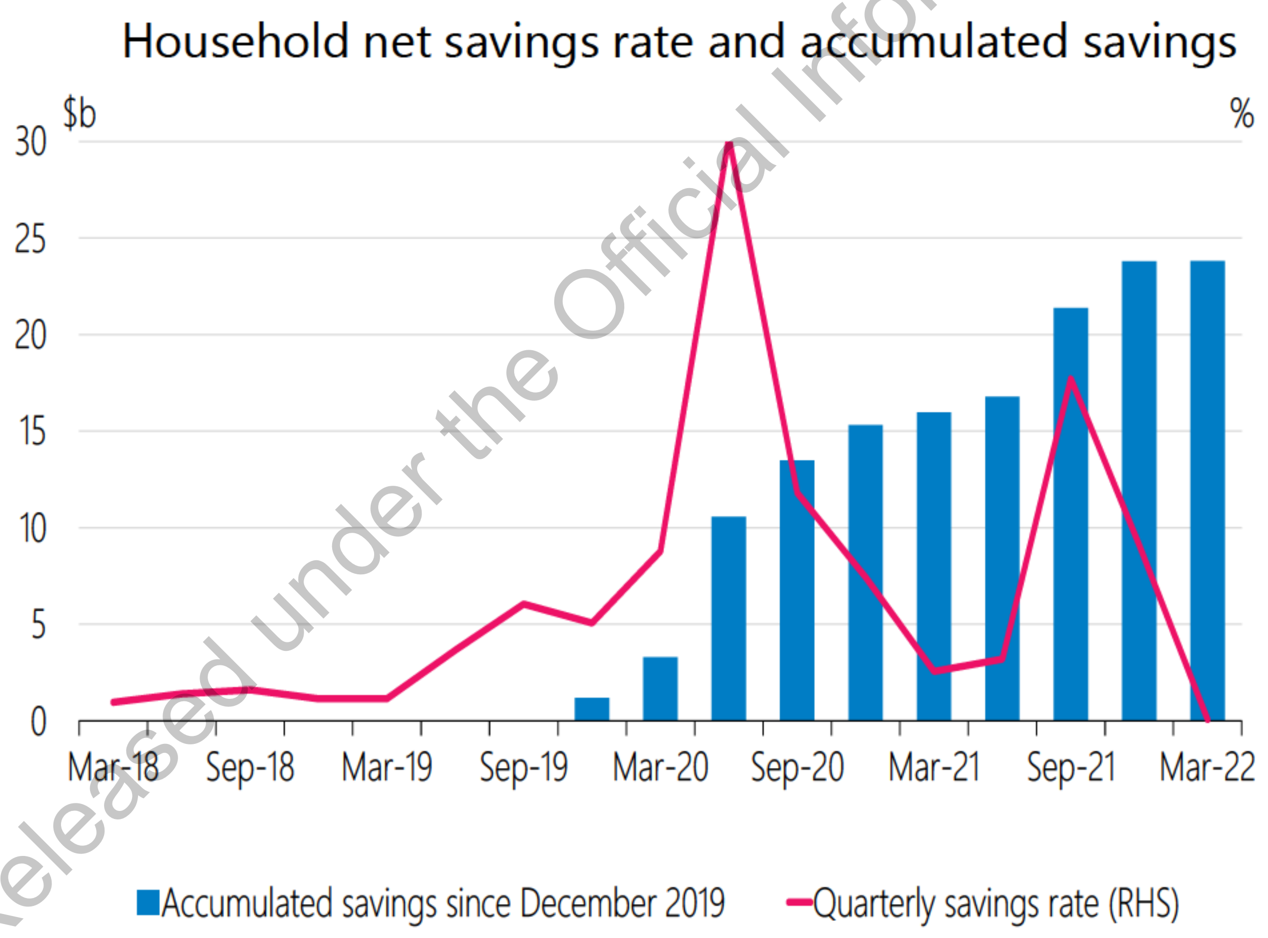
- Initial amendments to CCCFA regulations and RLC came into force on July 7.

- Further changes to regulations announced in August (to implement by March 2023) to:
  - Narrow the expenses considered by lenders
  - Relax assumptions about credit cards and BNPL
  - Make debt refinancing more accessible

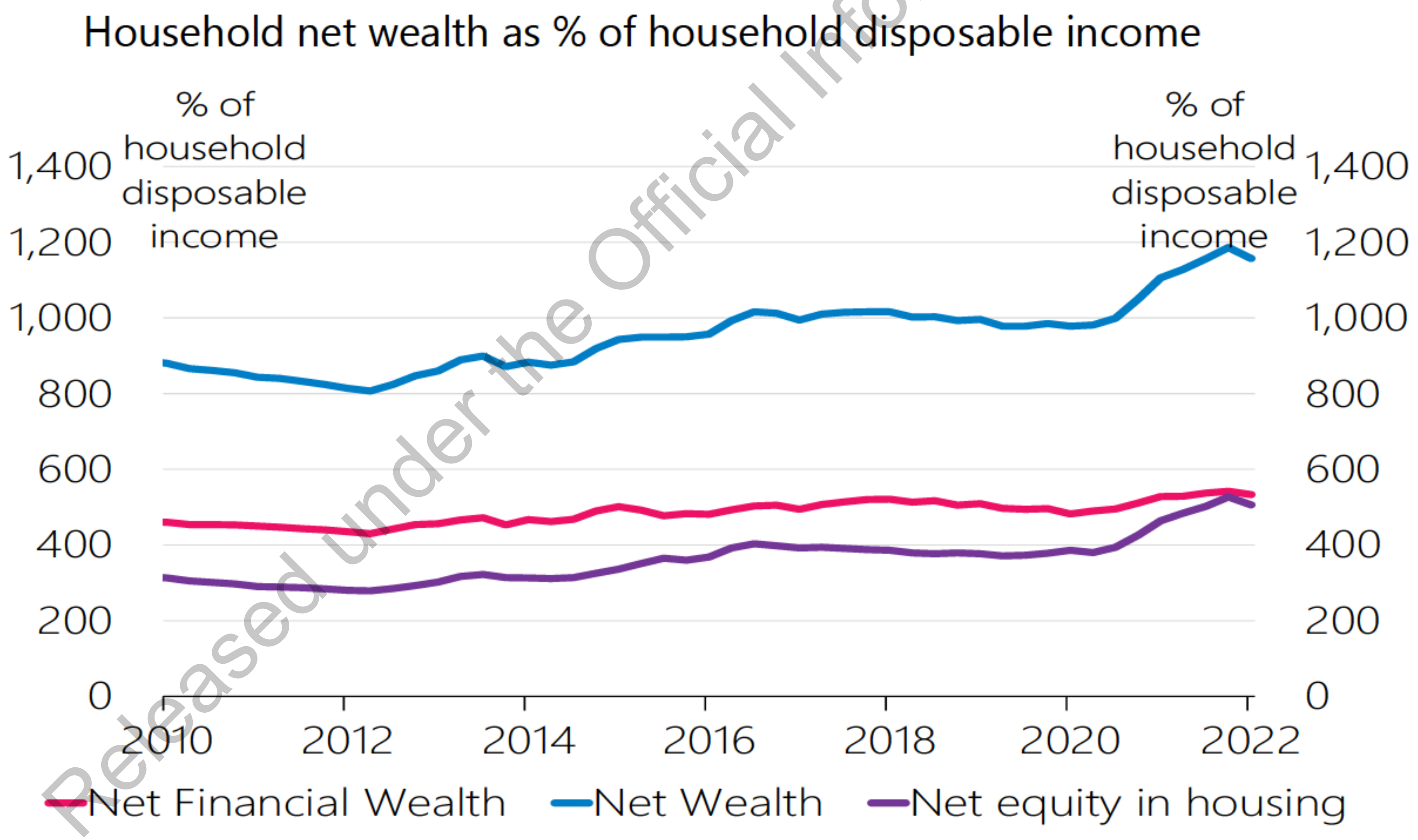
- Contacts have noted:
  - Banks have become more used to the requirements
  - Recent changes have helped, but penalties of breaches are still seem as too high / disproportionate
  - Higher costs of processing applications have been passed on to consumers

Household resilience

Household savings have levelled off

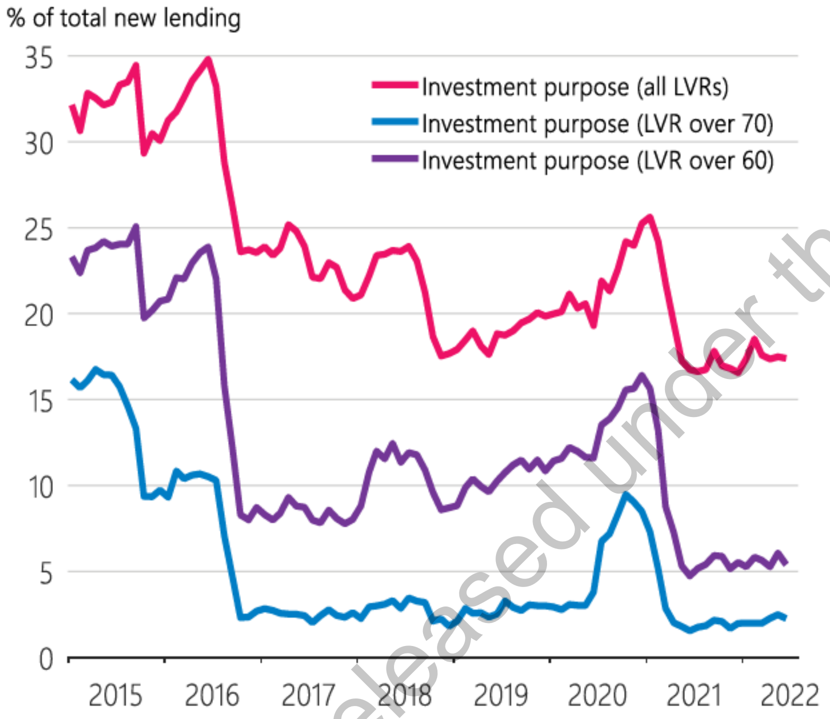


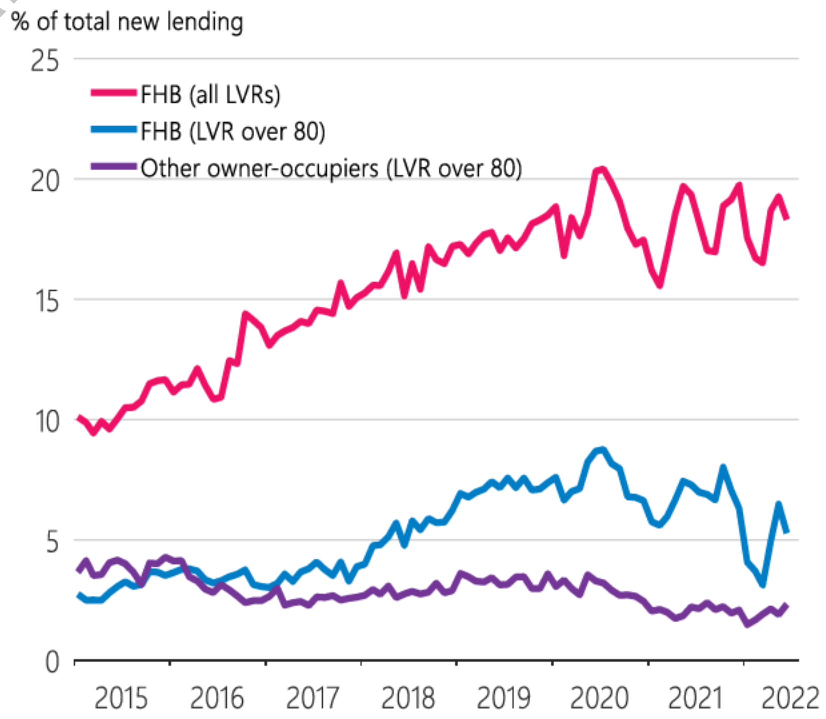
Some fall in household wealth, but after large gains



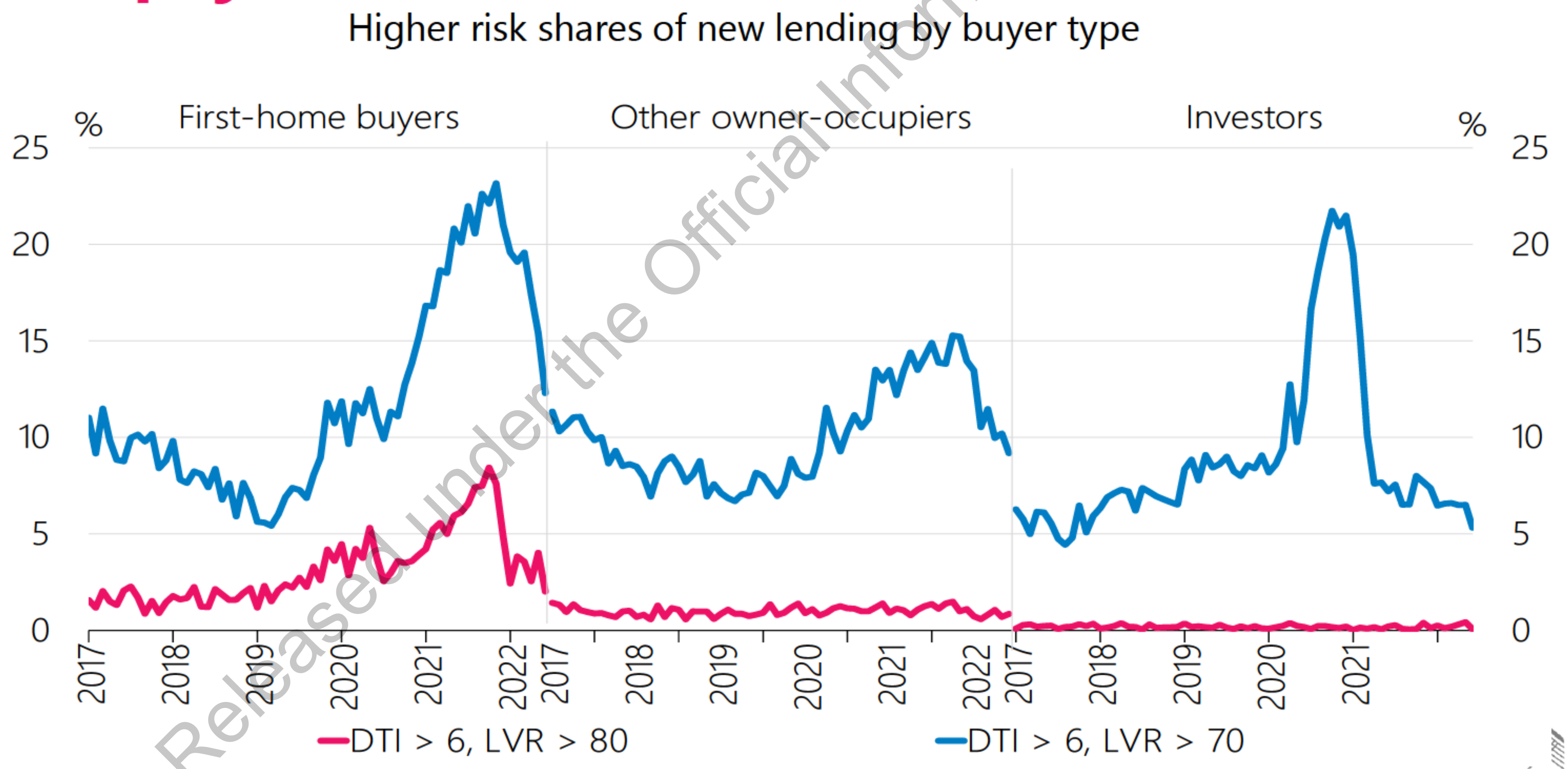
High LVR lending has fallen, especially for investors

Share of new lending by buyer type and LVR

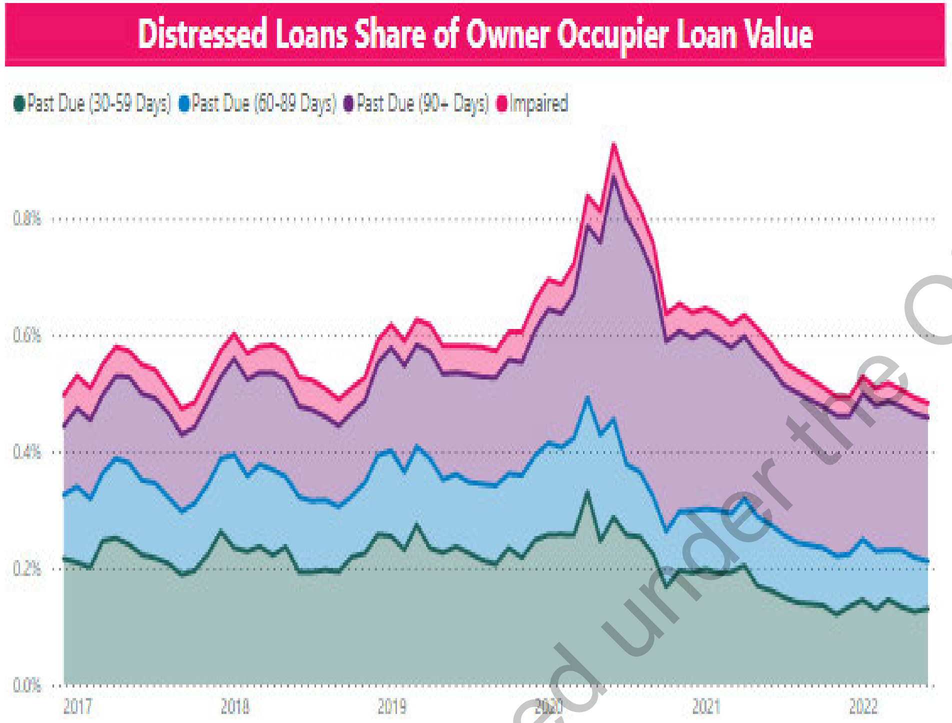


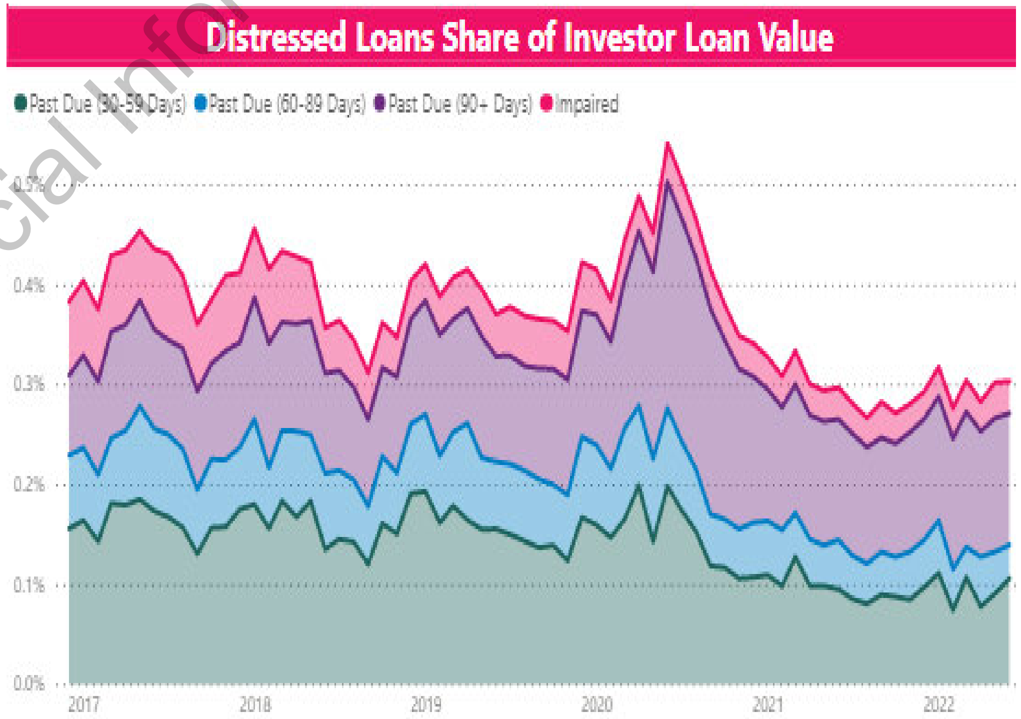


Higher risk lending has fallen sharply

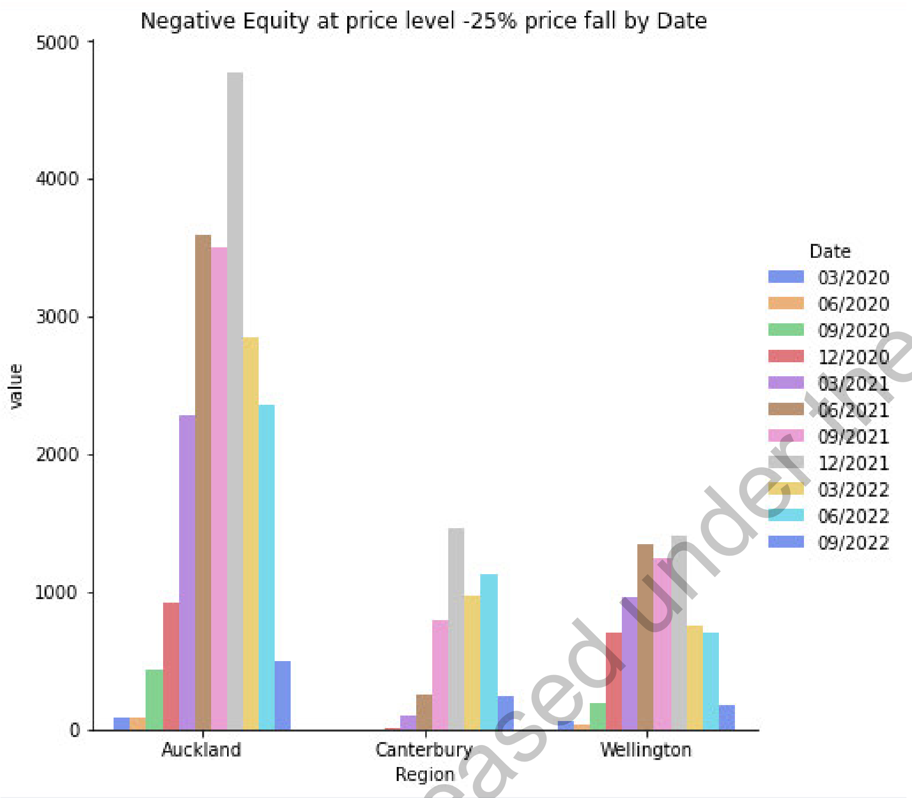


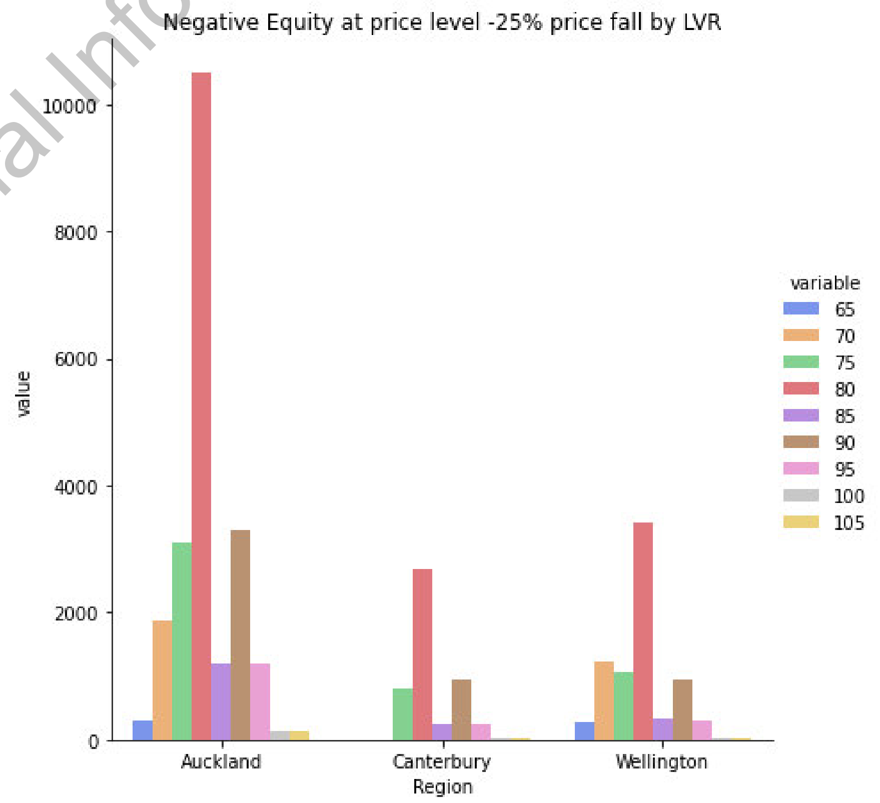
Signs of mortgage stresses still low





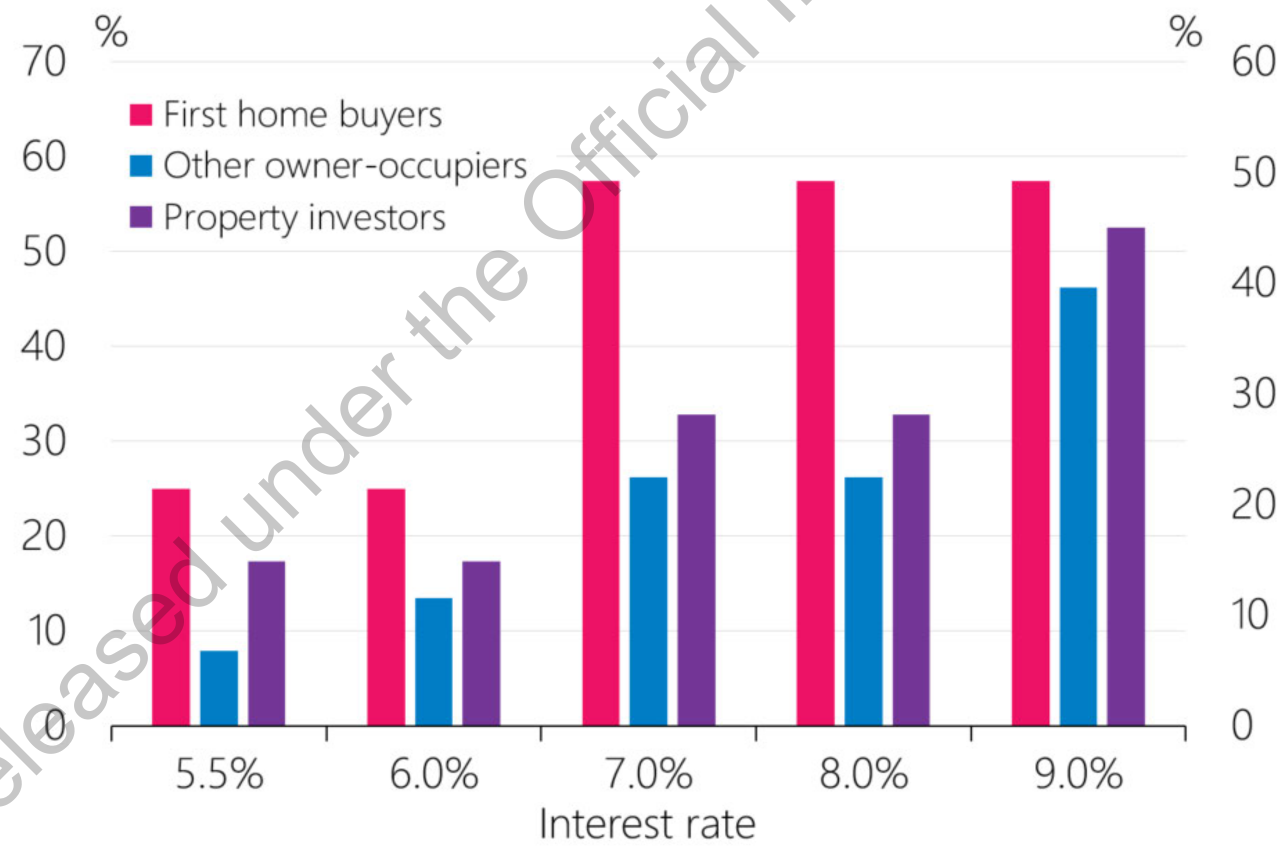
Risk of borrowers going into negative equity





Increases in mortgage rates would see some recent buyers face serviceability stress

Estimated share of lending in the year to Dec 2021 that would face serviceability stress under different interest rates, by buyer type



Economic spillovers from falling house prices?

- **de Roiste, Fasianos, Kirkby and Yao, RBNZ DP 2019/01**

- Impact of changes in housing wealth can be asymmetric:
  - Leveraged gains most used to pay down debt (precautionary savings effect)
  - **Leveraged losses more likely to hit consumption** (collateral effect)

- Housing wealth elasticity on consumption for negative shocks is 0.23 vs 0.13 for positive shocks

- Household leverage dampens housing wealth effect on consumption in a boom, but reinforces it in a bust

Economic spillovers from falling house prices?

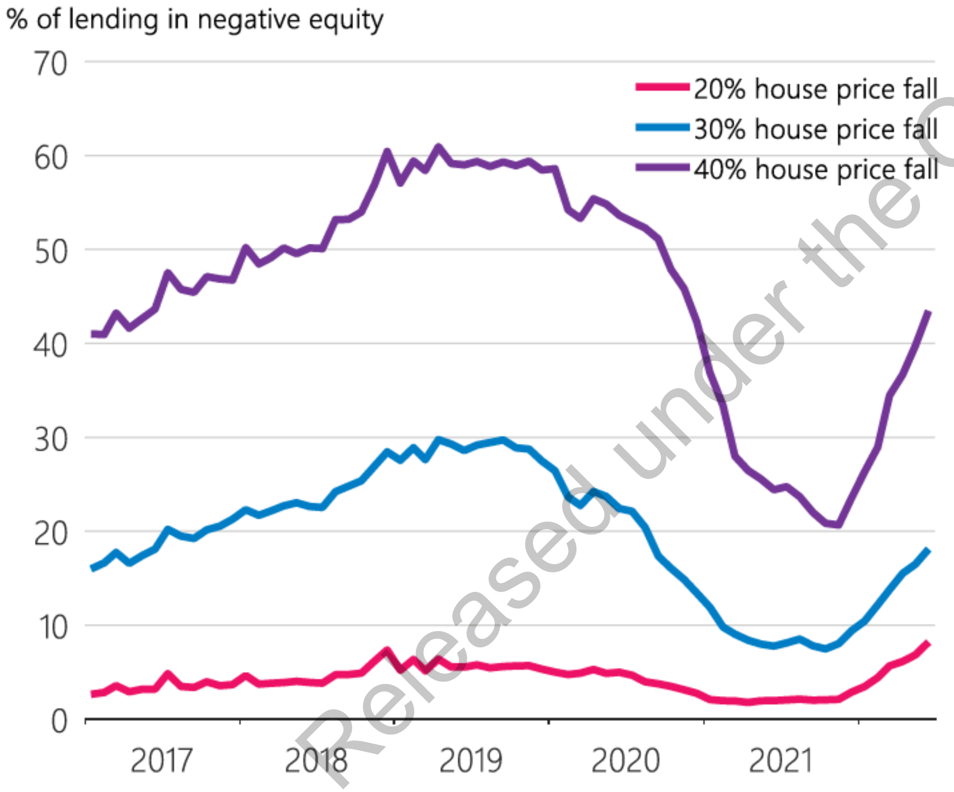
- **Wong RBNZ AN 2017/3**
- Consumption responds more to changes in financial wealth than changes in housing wealth
- Response of consumption to wealth has fallen after the GFC, especially with respect to housing wealth

Feedback / questions

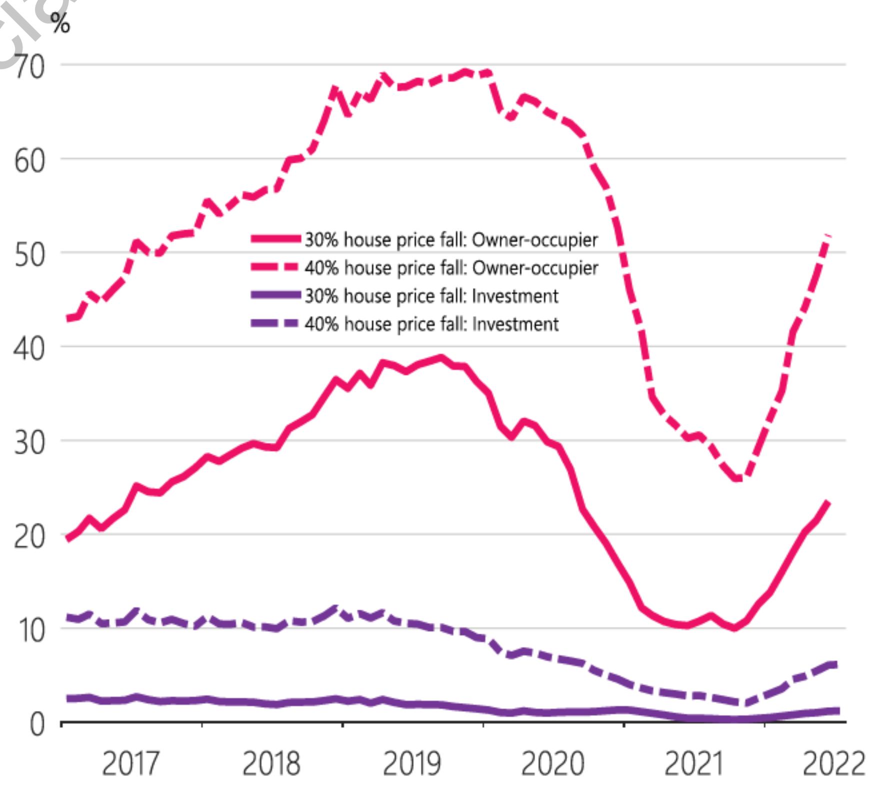
Risk of borrowers going into negative equity

Estimated share of stock of lending in negative equity following house price falls

20%, 30% and 40% house price fall



30% and 40% house price fall by borrower type



Document 18

Memo for Financial Stability Committee

From	Financial Systems and Analysis (Ken Nicholls, Tyler Smith, Thomas West)
Date	21 September 2022
Subject	2022 Bank Industry Stress Test
Purpose	To inform the committee about the outcome of the 2022 bank industry solvency stress test carried out by the Reserve Bank
For your	Decision

It is recommended that the Committee:

1. **Note** FSA has received the banks submissions which will be finalised once they make adjustments from us to improve consistency across banks. Results in this paper reflect bank submissions and not our recommended adjustments.
2. **Note** at an aggregate level, banks have sufficient capital to withstand the 2022 stress scenario of an economic downturn with high interest rates.
3. **Note** that a number of banks come close to the minimum total capital ratio in the outer years before mitigating actions, due to a large fall in their capital ratio combined with an increase in the regulatory minimum. We expect all large firms to be above minimum requirements after adjustments have been considered.
4. **Note** that rising unemployment is more important in driving losses than higher interest rates. The system has some buffers for servicing higher interest rates due to bank affordability assessments of mortgage applications. Firms highlighted the difficulty in modelling the impact of higher interest rates, given the lack of historical data. A number of banks indicated they are investing in their modelling capability and that this stress test proved a useful exercise.

Out of Scope

6. **Note** that the plan allows us to develop and apply scenario analysis that covers three factors of our Financial Policy Remit: Sustainable house prices (banks) - enhancing risk management of loan books; Climate change (banks/insurers) - assessment of climate risks to balance sheets; and Cyber resilience (banks/insurers).

7. **Note** the plan contributes to FSC meeting a number of its objectives by: identifying and assessing major and current emerging risks to the Reserve Bank's financial stability objectives; providing input into material issues and messaging in the FSR; and assisting our supervision of regulated entities.
8. **Agree** to release additional details about our stress test, in particular our detailed instructions document and templates. This will provide the market more transparency on our results and be consistent with the proposal in our recent paper outlining the 3 year stress test work-plan.
9. Comment on the findings from the 2022 stress test, which will be presented in a bulletin article in late October and summarised in the November FSR. It is recommend to FSC that we don't intend to discuss results with the Board given we expect large firms to clear minimums after adjustments, but will provide a note to the Board. Does FSC agree with this approach?

Purpose

1. This paper outlines the results of phase one of our 2022 solvency stress test for large banks (and a number of smaller banks). It covers a brief background of stress tests, scenario description, aggregate results and the drivers of these, as well as individual firm results.

Background

2. The main purpose of the solvency stress test is to assess financial stability and capital resilience of individual banks to risks posed by a hypothetical set of heightened macroeconomic variable paths.

3. Secondary purposes are; to continue to build capability in the industry; and to improve the identification of mitigating actions which has been a weakness identified in previous stress tests.

4. The stress test scenario begins in April 2022 and for the first time is conducted under the new capital framework. This meant that the capital requirements, minimum plus buffers, increased at the same time as capital was being stressed.

5. As with last year, results will be collected in two stages. Phase 1 results are those modelled by banks, submitted in late August. Phase 2, will include our adjustments to improve consistency across banks, especially where we feel banks may not have applied sufficient severity.

6. Firms noted the value gained from processing such stresses especially regarding advancements in credit modelling approaches that are applicable to improving base IFRS9 modelling techniques.

Scenario description

7. The 2022 stress scenario features a global slowdown in economic activity as central banks raise interest rates in the face of high inflation rates and the lingering impacts from the pandemic. The New Zealand economy

experiences a period of high inflation and low economic growth with the economy in recession for two years. It also includes a 1-in-25 year cyber risk 'event'.

8. Whilst not as sharp as the decline in recent stress tests (a comparison to 2021 is shown in the appendix), gross domestic product does not recover to pre-stress levels. House prices fall 42 percent, commercial property falls 45 percent, equity prices fall 40 percent, unemployment rate rises to 9.3 percent and GDP contracts by 5 percent. Credit spreads widen increasing funding costs, the OCR reaches a peak of 5.5 percent in year 3 and the 12 month fix mortgage rate reaches 8.2 percent. There is a 2-notch downgrade of bank's long term debt.

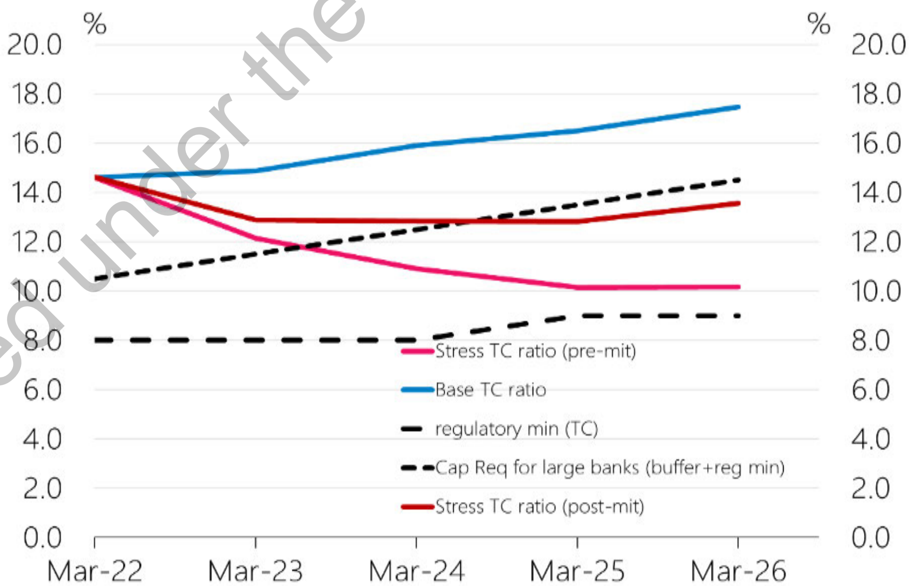
Aggregate results before mitigants

9. The results presented in this paper are those generated from banks modelling the impact on their balance sheet, profitability and capital from the prescribed scenario, assumptions and common set of instructions.

10. The aggregate total capital ratio (ATCR) in the stress test, shown below in chart 1, fell 4.5 percentage points (pp), the same as the 2021 stress test, to a minimum of 10.2 percent in year 3. This leaves sufficient capital for banks to continue lending whilst maintaining capital ratios well above the regulatory minima.

11. However, the ATCR and aggregate CET1 ratio fall into the Prudential Capital Buffer (PCB) in year 2 (Mar '23 to Mar '24) as banks transition towards 2028 capital requirements of 18 percent. Entering PCB would mean restrictions to distributions alongside capital buffer response framework measures.[1] Aggregate base and stressed total capital projections are illustrated in Chart 1.

Chart 1 – Aggregate total capital ratio[2]



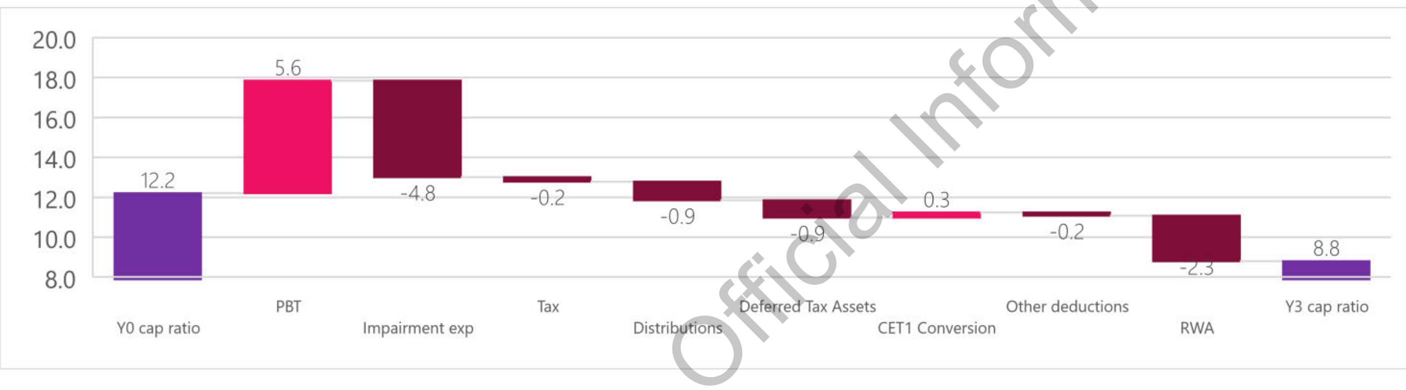
Drivers of results

12. The key drivers of fall in CET1 ratio from opening of 12.2 to 8.8 percent (Chart 2) includes:
    - Impairment expenses which is the usual focus of the solvency stress tests increased by $4bn compared with 2021 to an aggregate of $20bn (this includes $600m from smaller banks).

[1] Smaller banks have lower buffers as no D-SIB buffers required.
[2] Regulatory minimum total capital formed of CET1, AT1 and T1 capital. Prudential Capital Buffers consist of CCB, D-SIB and CCyB for large banks and exclude D-SIB for smaller banks. Buffers and minimums increase in line with transitional capital requirements.

- System aggregate risk weighted assets **(RWAs)** increased 28 percent over the stress period as credit quality deterioration across retail and non-retail portfolios from weaker economic conditions cause loans to migrate to lower risk grades with higher risk weights.[3] In addition, new capital standards in October 2022 impact the larger banks and bank and sovereign downgrades further weigh on RWA increases.[4]
- Net interest income provides a strong buffer for New Zealand banks in times of stress. This year banks modelled much higher net interest income than last year's stress test as banks were assumed to be able to pass on higher funding costs to customers in a rising rate environment[5]. In comparison the 2021 scenario had negative interest rates which lead to a large decline in modelled net interest income with a floor on the reduction in deposit rates and a squeeze in asset margins.
- Amortisation of Tier 2 capital which was not replaced and capital issuance was limited to post-mitigant results. This increases the impact on total capital but not CET1.

Chart 2 – Drivers of CET1 results to capital low point



Out of Scope

14. As part of Phase 1 feedback we requested some banks make changes to their modelled outcomes where we feel they have not correctly estimated risks. The adjustments are based on; a comparison to peers, comparison with previous stress test results, discussion with each bank, and our internal modelling and expert judgement. The resulting adjusted results will be reported in the bulletin article. This is likely to affect individual bank results whilst leaving the aggregate outcomes and messages broadly unchanged. However, the underlying principle is to rely on the bank modelled outcomes.

s9(2)(b)(ii)

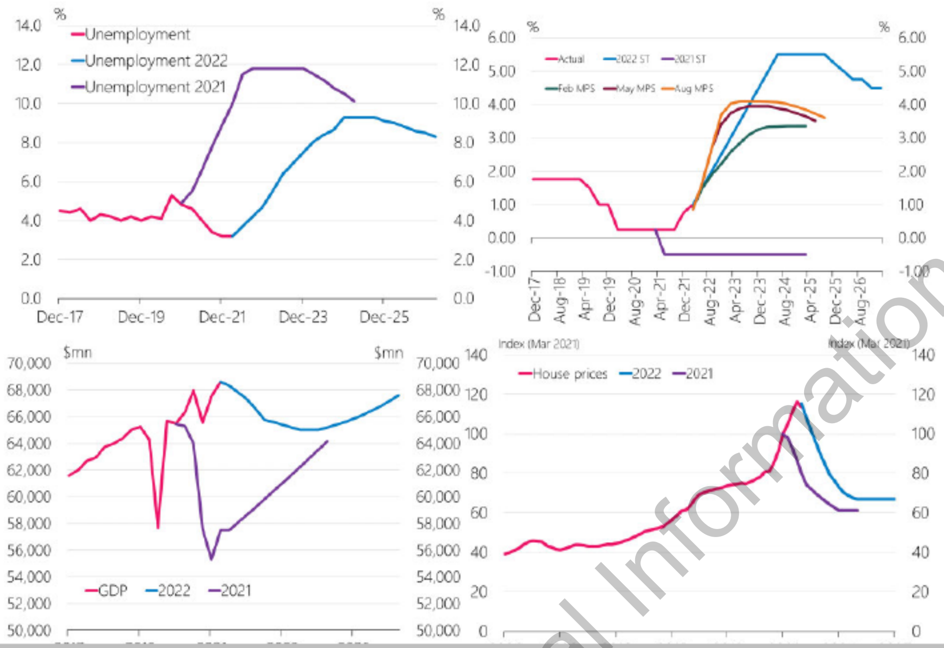
Individual bank results

s9(2)(b)(ii)

s9(2)
(b)(ii)

Appendix

Charts 1-4: Unemployment, OCR, GDP, HPI



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s9(2)(b)(ii)

s9(2)(b)(ii)

[redacted]

Document 19

Memo for Financial Stability Committee

From	Financial Systems and Analysis (Ken Nicholls, Tyler Smith, Thomas West)
Date	3 November 2022
Subject	2022 Bank Industry Stress Testing – Mortgage Sensitivity
Purpose	To inform the committee about the mortgage sensitivity outcome of the 2022 bank industry solvency stress test carried out by the Reserve Bank
For your	Information

It is recommended that the Committee:

1. As part of the 2022 Stress Test firms conducted a mortgage default sensitivity to two additional mortgage rate paths to further understand the impact of rising rates on mortgage defaults.
2. As mortgage rates move above 6 to 7 percent defaults start to increase more rapidly, albeit with a slight lag.
3. The average net interest margin projection in the 2022 Stress Test was flat to slightly positive. If we were to use a more negative NIM projection, such as that used in the 2021 Stress Test, banks' capital headroom above regulatory minimums would become tighter.

Sensitivity analysis

We often want to assess the sensitivity of stress test results to changes in important variables. For this stress test, large banks were requested to provide sensitivities of their results to changes in interest rates. We also performed a top-down sensitivity using our desktop model to assess changes in the net interest margin.

Changes in mortgage rates sensitivity

As part of the 2022 Solvency Stress Test the large banks were required to model two different mortgage rate paths to identify the impact on mortgage defaults, illustrated in Figure 2:

- Sensitivity 1 – No rate change, mortgage rates held at the March 2022 level; and
- Sensitivity 2 – mortgage rates 100bps lower than the prescribed stress test rates (e.g. the peak 2 year fixed rate is 7.4 percent and the stress test is 8.4 percent).

Figure 1 shows cumulative defaulting customers as a percentage of total customers for the two sensitivities compared to the stress test results. The difference between the heights of the bars in each year represents the effect of the different mortgage rates on defaults - all other drivers for both sensitivities, such as the unemployment rate and house prices, were the same as the stress test.

Defaults in the stress test increase more rapidly than the no rate change sensitivity in years 3 and 4, as the 2 year stress mortgage rate rises above 7 percent (peaking at 8.4 percent). Defaults in sensitivity 2 compared to the no rate change sensitivity show a similar pattern but to a lesser extent with rates peaking at 7.4 percent. By the end of year 4, cumulative defaults in the stress test were 50 percent higher than in the no rate change sensitivity and 18 percent higher than sensitivity 2 with most of the differences occurring in years 3 and 4.

Another way to interpret the results is that the level of defaults over 4 years increases by approximately 30 percent when the mortgage rates increase from 4.5 percent to approximately 7 percent (sensitivity 2). However the defaults increase by 50 percent when the mortgage rates increases from 4.5 percent to approximately 8 percent in the stress test.

This indicates that as mortgage rates move above 6 to 7 percent defaults occur more rapidly, as interest rates become a more important driver.

This conclusion is consistent within the range of test rates (5.5 to 7.5 percent) large banks have used, since 2019 and until the stress test was designed in early 2022, for the affordability assessments of mortgage applications.[1]

Note that mortgage default growth rates (the difference in height of bar in each year – Figure 1) increase sharply in years 3 and 4, when mortgage rates peak and start to decline. This indicates a lagged impact of defaults occurring approximately 1 year after mortgage rates have peaked.

Figure 1: Cumulative mortgage default rates

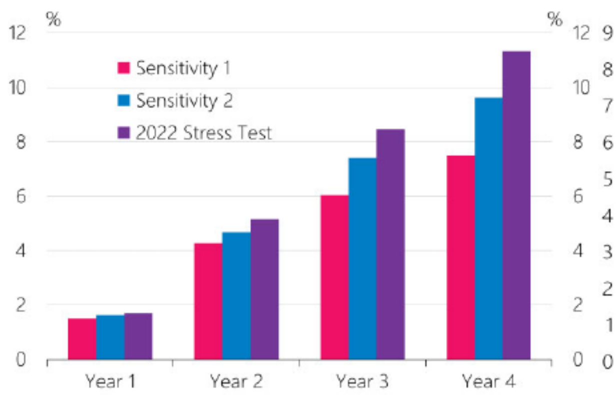
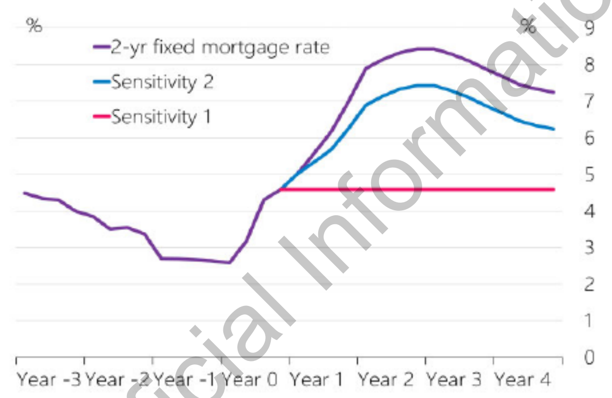


Figure 2: Solvency stress paths for 2-year fixed mortgage rates



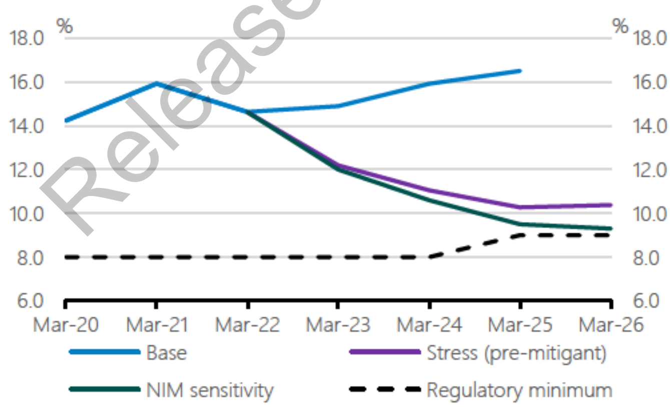
Source: Bank solvency stress submissions, RBNZ calculations.

Net Interest Margin (NIM) sensitivity

Aggregate NIM increased slightly in this stress test as most banks maintained the margin between their deposit and mortgage rates. This was quite different to recent stress tests which have featured a low OCR and a sharp contraction in NIM - the zero floor on deposit rates meant banks could not reduce deposit rates in line with reductions in mortgage rates.

In the 2021 stress test, aggregate NIM contracted by 30 bps causing a fall of annual net interest income of approximately 15 percent. We applied the lower 2021 stress test NIM assumptions to the 2022 stress test results. This leads to a fall in the aggregate capital ratio by a further 100 bps in year 4 to 9.3 percent, bringing it close to the regulatory minimum of 9 percent and some banks below the minimum, Figure 3. This would increase the importance of banks' mitigating actions.

Figure 3: Aggregate total capital ratios - NIM sensitivity



Source: Bank solvency stress submissions, RBNZ calculations.

[1] For further discussion of test rates refer to November 2022 FSR

Document 20

Reserve Bank
of New Zealand
Te Pūtea Matua

Solvency stress test results

Round Table

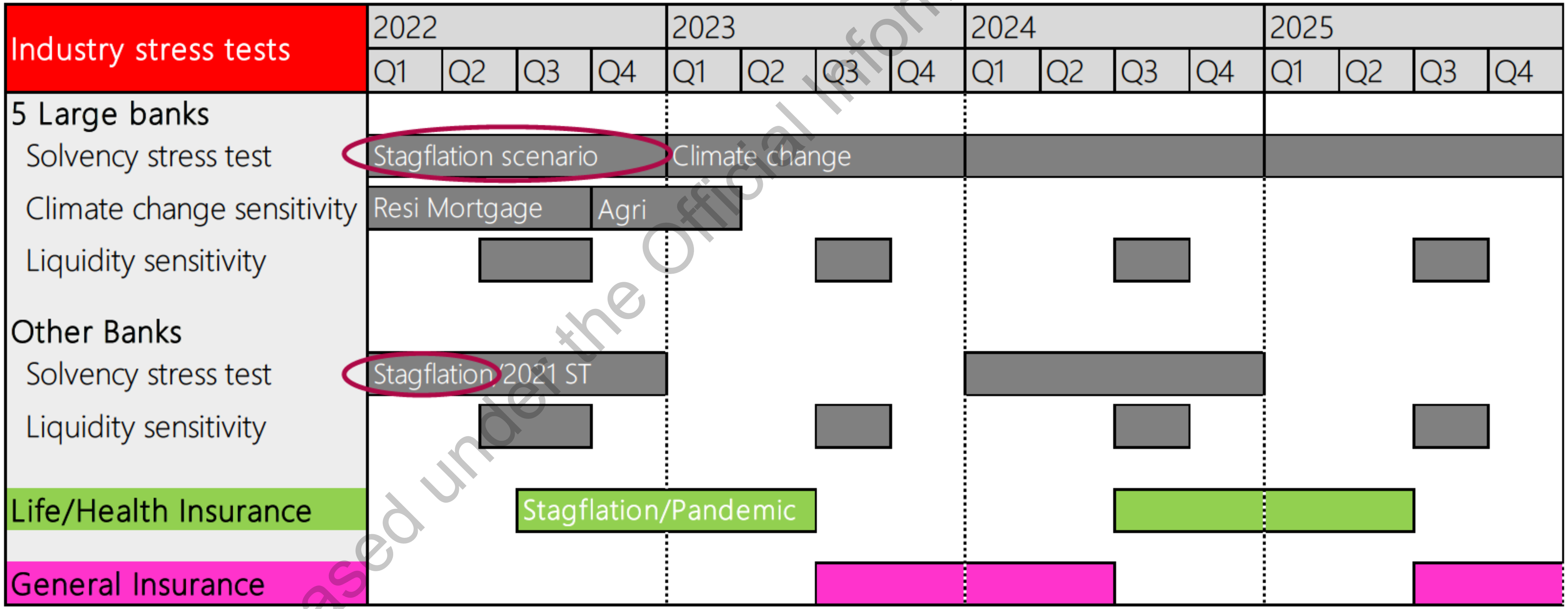
Key themes, initial challenge and outlier identification

19 September 2022

Ken Nicholls / Tyler Smith / Tom West

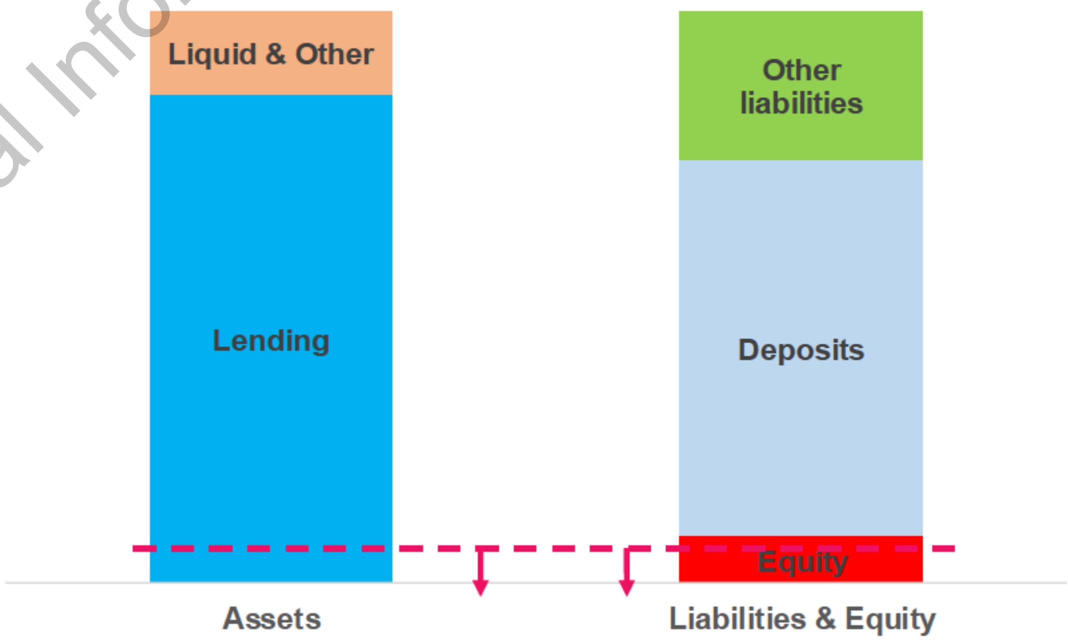
1. Background to our Industry Stress Tests
2. 2022 Solvency aggregate stress test results
3. Individual bank results
4. Insights

Industry Stress test work-plan



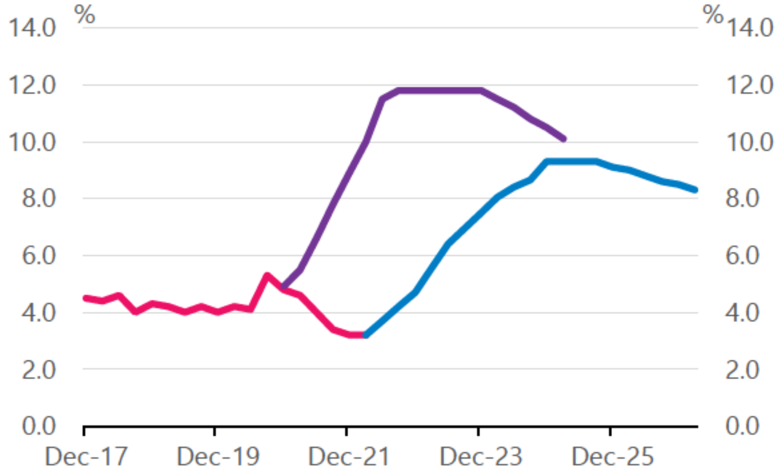
Purpose of bank solvency stress test

- Health check of a bank's balance sheet to see if banks are holding enough capital to support lending in times of stress.
- Improve understanding of the implications of current and emerging risks to financial stability.
- Support improvements in financial risk management of firms.

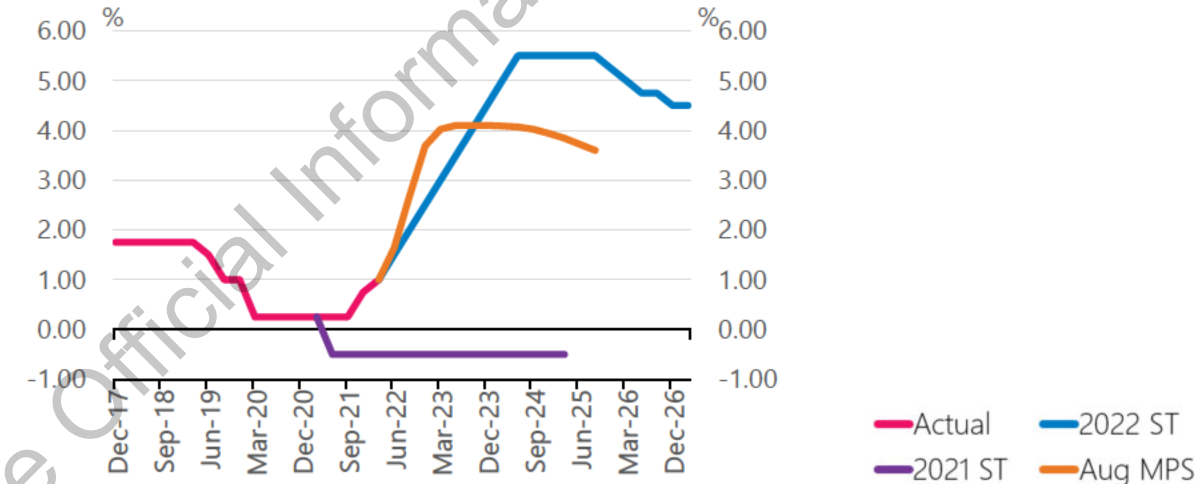


2022 Solvency Stress Scenario

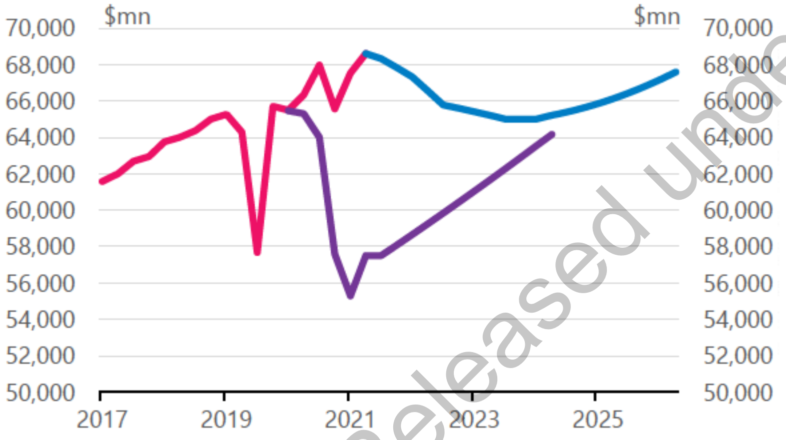
Unemployment



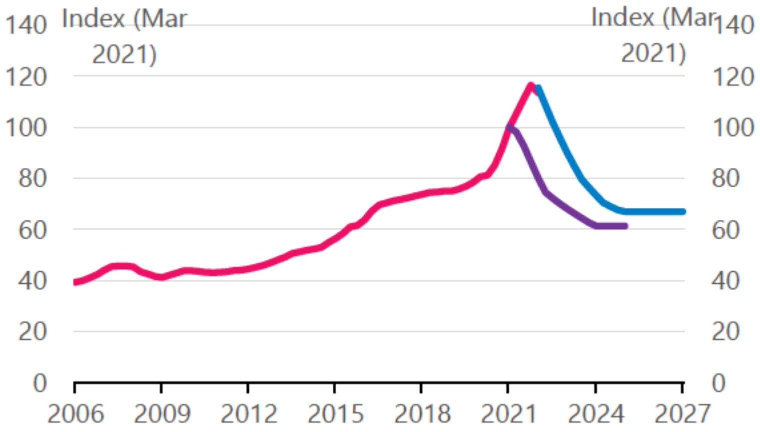
OCR



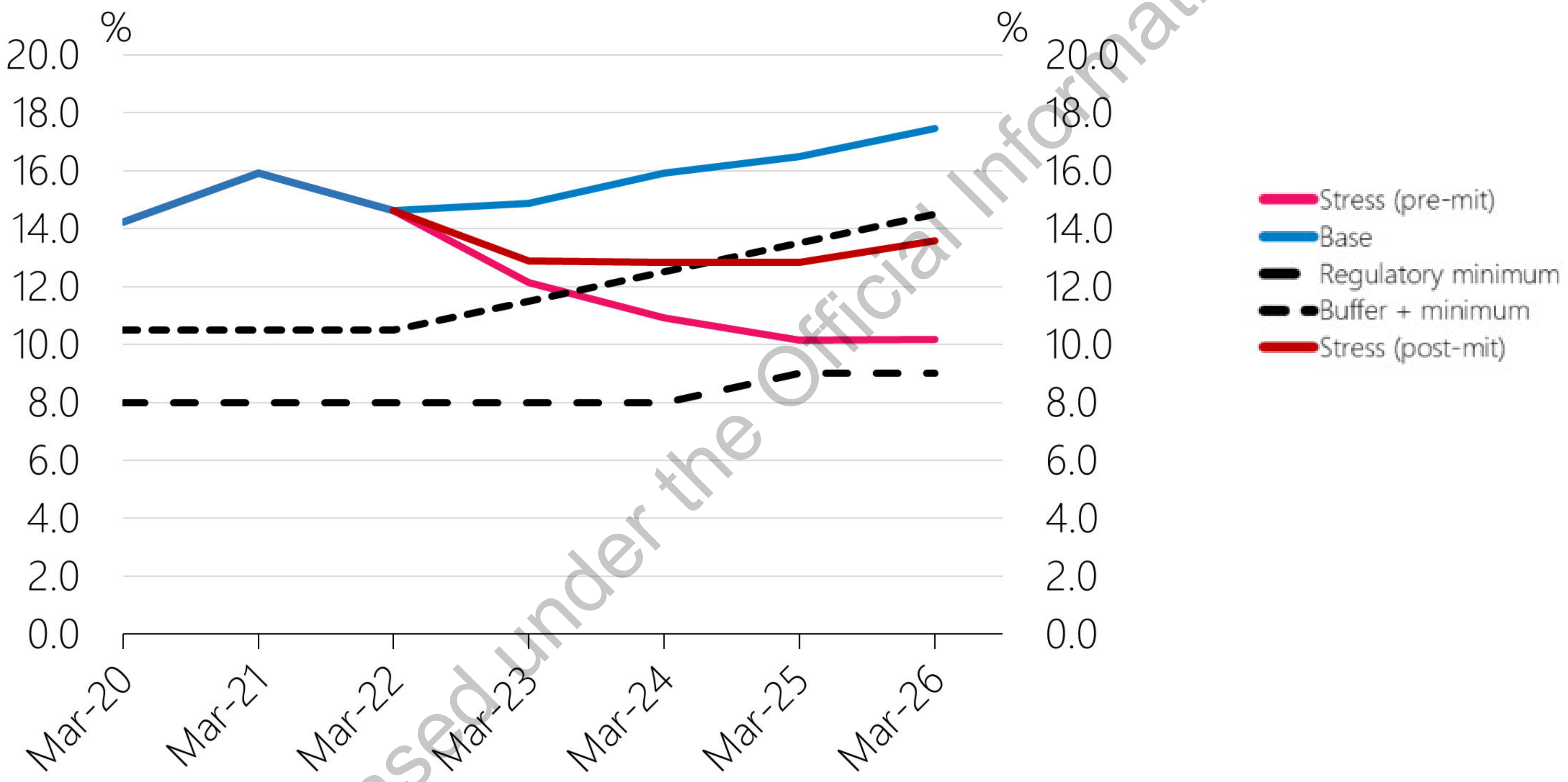
GDP



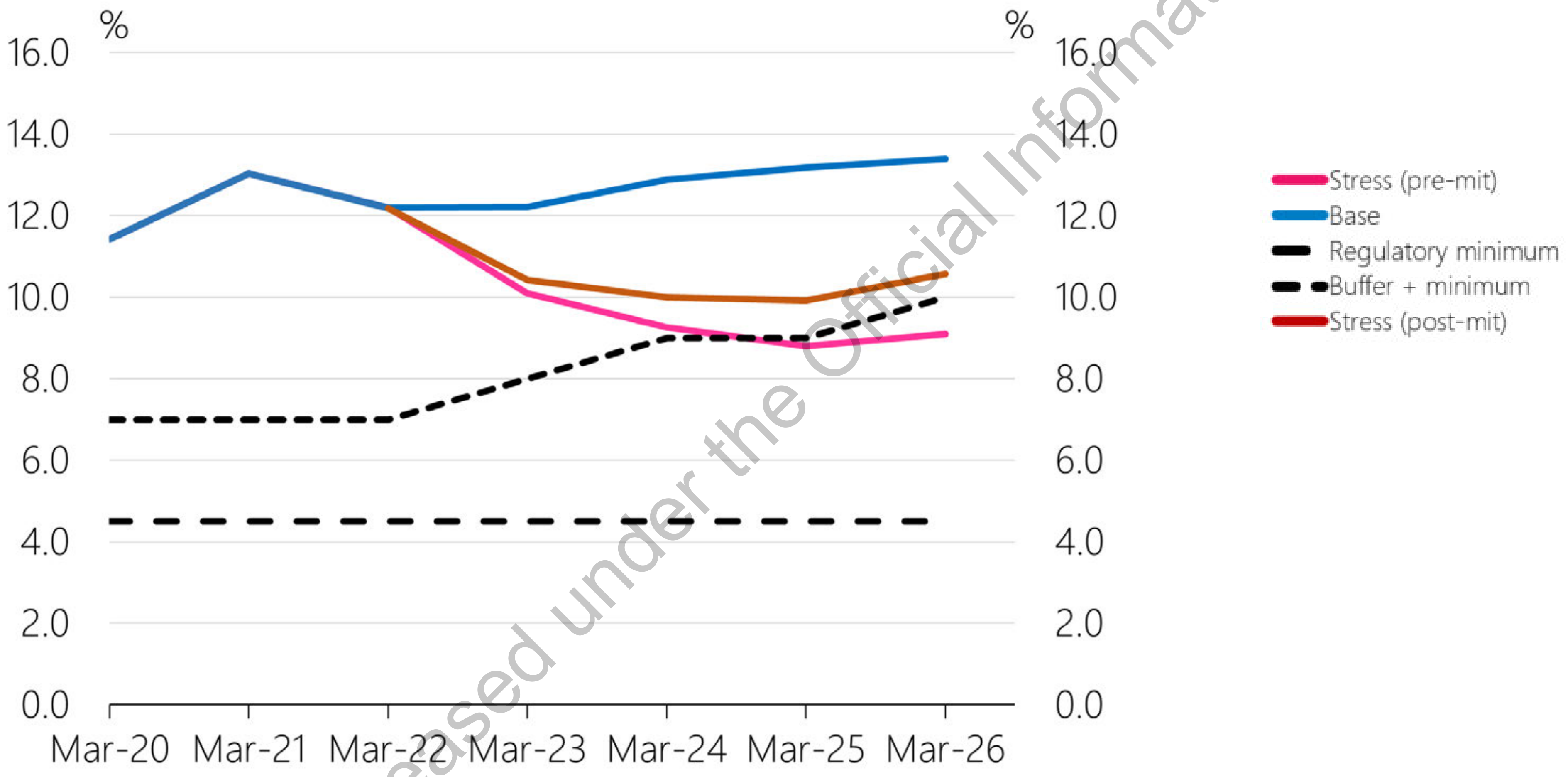
House prices



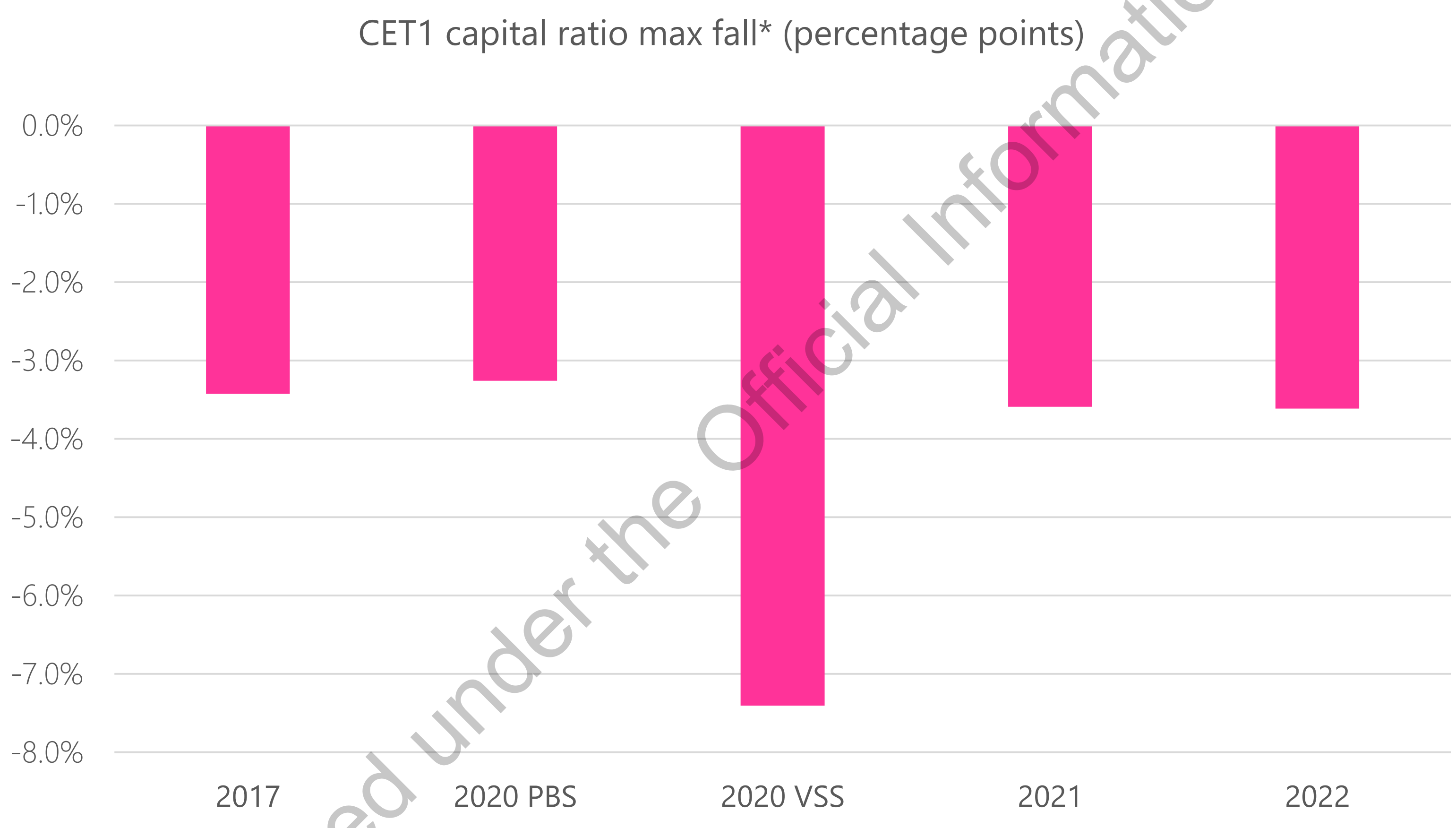
Aggregate Total Capital ratio



Aggregate CET1 Capital ratio

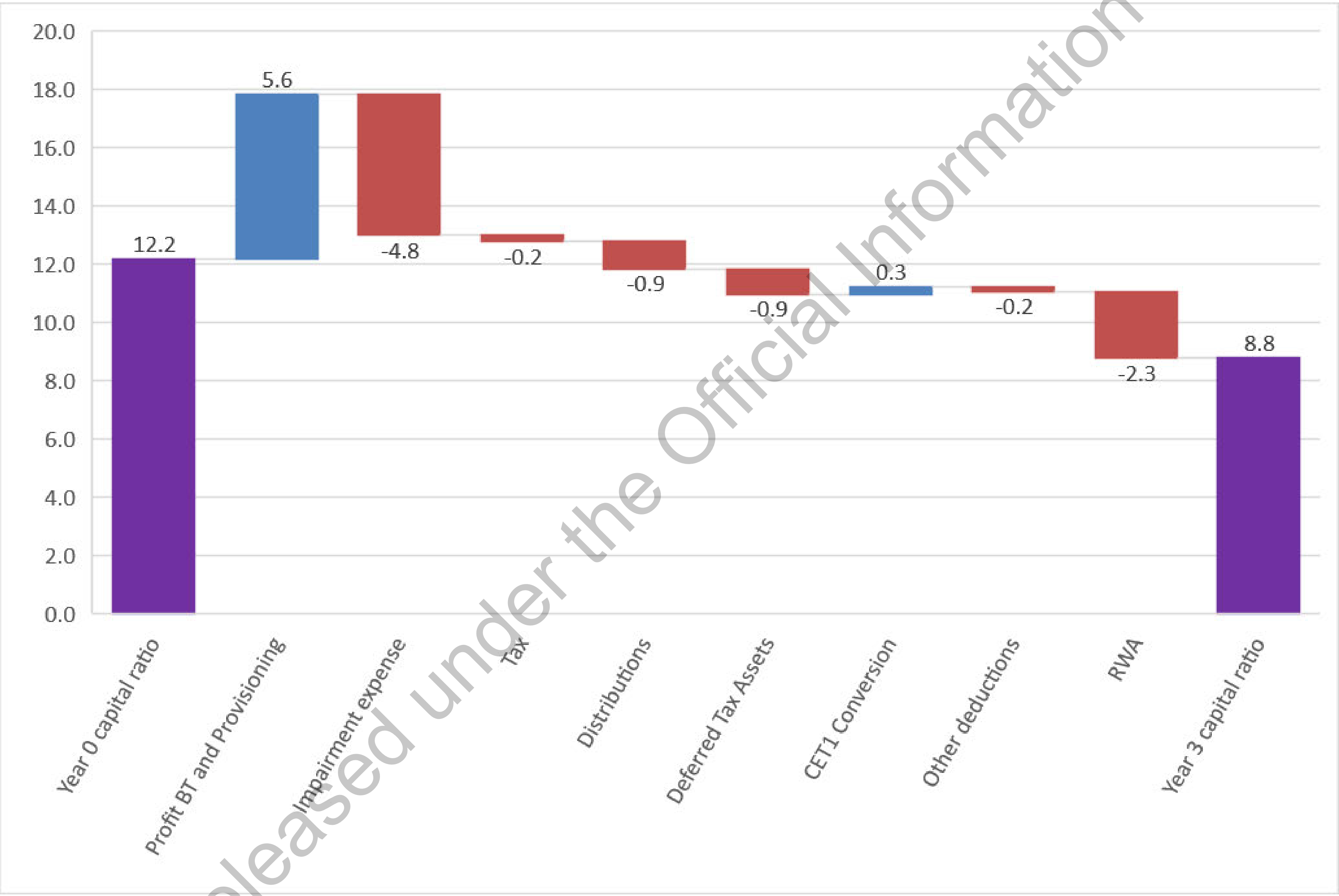


Comparison to previous stress tests

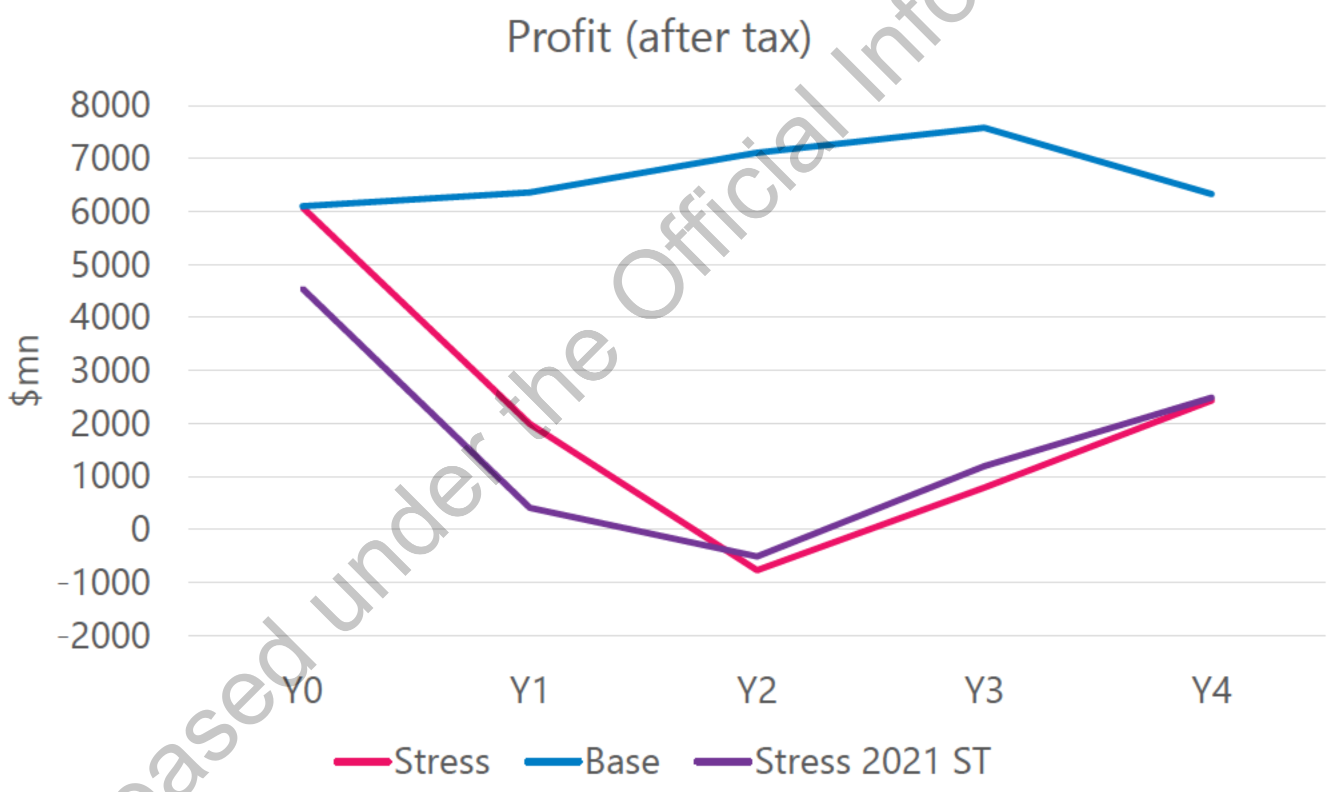


*excludes conversions

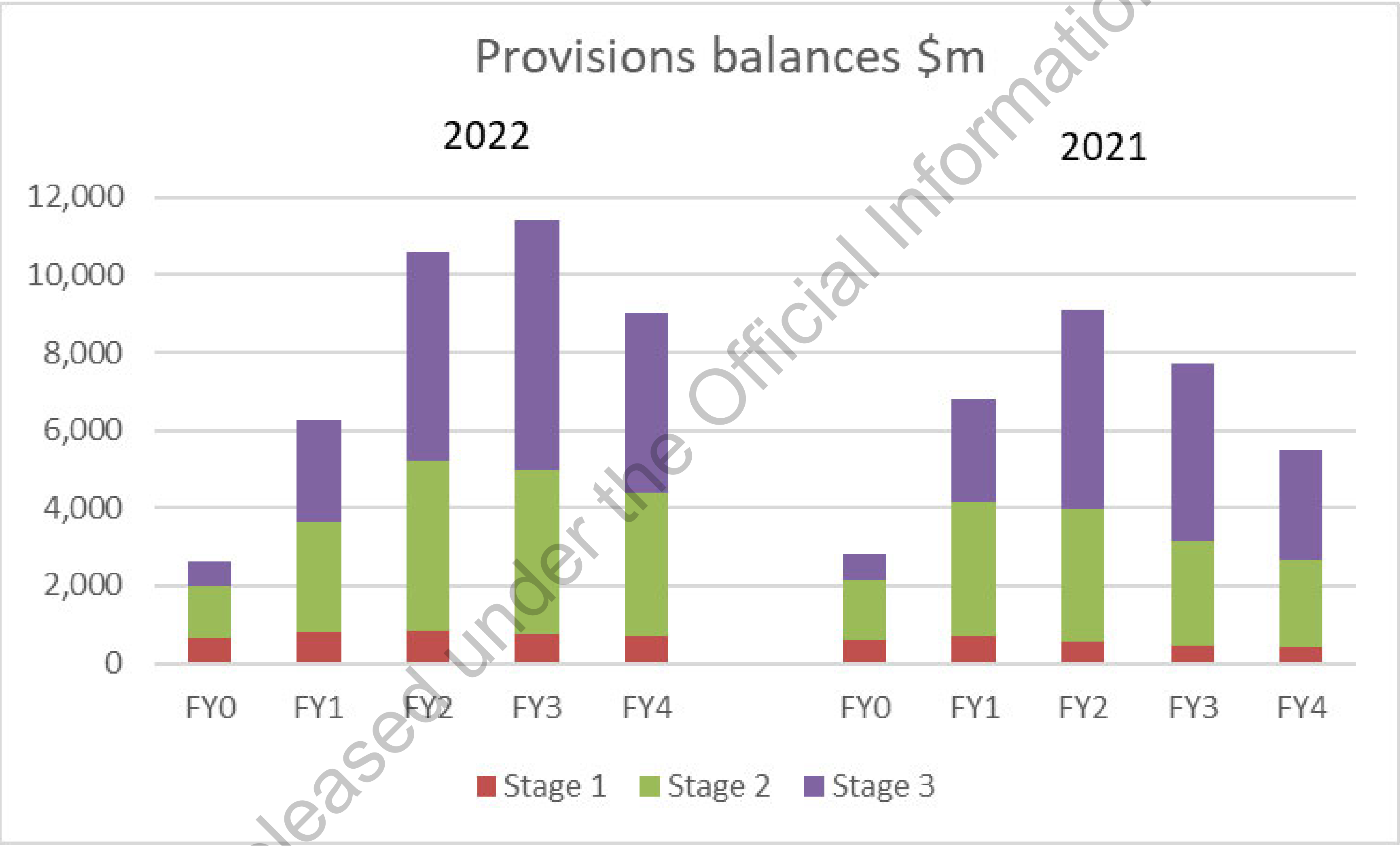
Drivers of CET1 results



Profitability



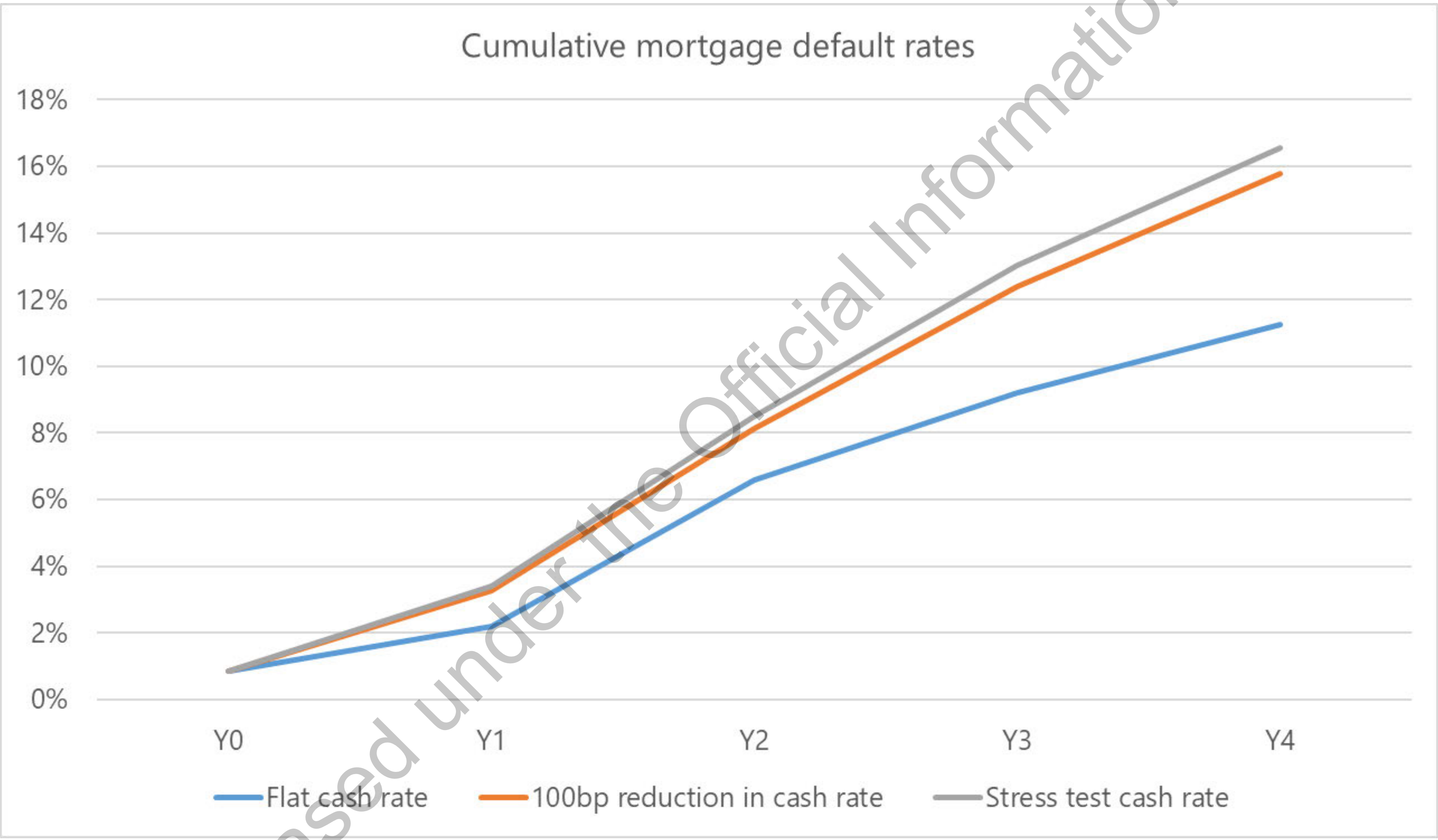
Provisions


Provisions balances $m
2022
2021
12,000
10,000
8,000
6,000
4,000
2,000
0
FY0
FY1
FY2
FY3
FY4
FY0
FY1
FY2
FY3
FY4
Stage 1
Stage 2
Stage 3

Loan impairment expense ratios
(over the 4 years)

Product	Loss rate %	Default rate %	Loss given default %
	2022	2022	2022
Mortgages	1.8	11	16
Household	9.9	14	74
Commercial property	8.2	30	27
Agriculture	4.4	20	22
Corporate	6.6	16	43

Mortgage sensitivity



Any questions so far...

Cyber risk scenario

- s 9(2)(b)(ii) [redacted]
- s 9(2)(b)(ii) [redacted]

s9(2)(b)(ii) [redacted]

Mitigants and importance

s9(2)(b)(ii)

[redacted]

Some of the things banks learnt

- For many banks this was their first stress test to assess their capital and risk management practices against high interest rate scenario
- In systemic stress, most banks likely to fall into the PCB placing demands on supervisors to review plans and monitor capital levels consistent with our framework
- Good to see banks are investing in modelling capability.
- Varied approaches to modelling high interest rates and number of overlays could be worthwhile for us to have a detailed looked at important stress test models eg. mortgages
- Supported modelling of IFRS provisioning
- Improvement in risk management
- Insights from cyber event – one bank using it for audit purposes

Some of the things we learnt

- Enough capital in the system for banks to continue lending.
- Application assessment stress testing banks conducted has helped provide a buffer against rising rates in this stress test.
- Credit risk modelling under rising interest rates challenging - banks are talking about investing in stress test modelling
- Benefits from stress testing for IFRS 9 provisioning
- Application and importance of role of CCyB.

Next steps

- Phase 2 changes sent to banks – 14th Sep
- FSC meeting – 27th Sep
- Phase 2 submissions – early Oct
- Board information paper including Bulletin article – mid Oct
- Publish bulletin – end Oct
- FSR publication – 2nd Nov
- Feedback session including anonymised peer comparison – Early Nov

Questions

Appendix

Thoughts...

Here's a few things we've been thinking of:

1. How feasible are large cure rates under a severe stress scenario?
2. Do we have any historical analysis of how much issuance dries up in stressed conditions – could cap issuance limits in future stress tests for instance?
3. What are the GDP impacts from reduced lending from banks in a stress? Any macro models we can draw from?
4. How can we gauge the positive benefits stress testing have on FS?
5. Will 3% buffer testing at application reduce supply of credit?

2021 Capital drivers

Figure 7: Decomposition of changes in Aggregate CET1 by year three (% of RWA)