INSIGHT CREDIT

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IFM Investors

RMBS and mortgage stresses: Modelling the impacts of stress scenarios

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Australian household finances are under increasing pressure with monetary policy tightening and rising costs of living.

This is testing the ability of mortgage holders to service their loans, which has implications for the housing market and the performance of residential mortgage-backed securities (RMBS). We anticipate that mortgage arrears and default rates will rise from their current levels and we have modelled various stress scenarios on rated notes in a recent prime RMBS transaction to assess the implications of this economic environment on these securities.

We find that significant deterioration from current levels would be required prior to incurring principal losses on the rated notes. We continue to monitor these securities for growing stresses that may exceed these threshold levels and for any implications on the broader Australian economy.

Current Performance

Since September 2022, we have seen the level of prime mortgage arrears start to rise from historical lows back towards long-term averages. The growth in mortgage arrears is largely driven by monthly household cashflows being impacted by rapidly rising mortgage rates and higher costs of living which have not necessarily been offset by wages growth.

FIGURE 1

PRIME MORTGAGE ARREARS VS VARIABLE MORTGAGE RATES

Source: RMBS Arrears SPIN Statistics: Australia (Excluding Noncapital Market Issurance) June 2023 and Reserve Bank of Australia

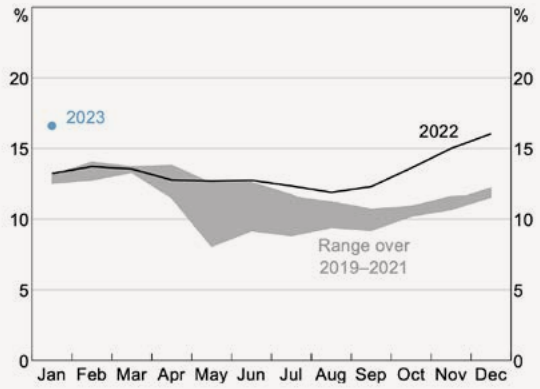
Despite the sharp rise in rates, we are only now seeing arrears mean revert, which in part is due to a lagged impact between changes in the RBA cash rate and the change to current variable interest rates. Mainly, however, this is due to household cashflow buffers that existed prior to monetary policy tightening, which is reflected in APRA serviceability requirements and non-bank originator underwriting criteria. The buffer allows for a 2.5% to 3.0% increase in the current variable mortgage rate, after the borrowers' net income has met all existing financial indebtedness, basic living expenses and the new mortgage rate. This can be seen as the minimum level of buffer at origination given that not all borrowers will look to take out their maximum borrowing capacity.

While these cashflow buffers have helped most mortgage holders withstand some of the initial rate rises, monetary policy tightening has increased beyond these serviceability buffers for a segment of borrowers, making them more vulnerable to falling behind on their mortgages. We are seeing this play out with a greater share of mortgage borrowers drawing down on savings and prepayment buffers as the rate rise cycle has constrained spending capacity (this is particularly the case with more highly geared households i.e. mortgage LVRs > 80%). The current proportion of borrowers that have drawn from their offset or redraw balances over the last 3 months is approximately 5% higher than was witnessed over 2019-2022.

This stress is expected to be driven largely by loans originated more recently, with the proportion of average mortgage repayments as a percentage of household income significantly lower for loans pre-2019.

FIGURE 2

WITHDRAWALS FROM MORTGAGE PREPAYMENTS*
Share of variable-rate owner-occupier loans, by calendar year

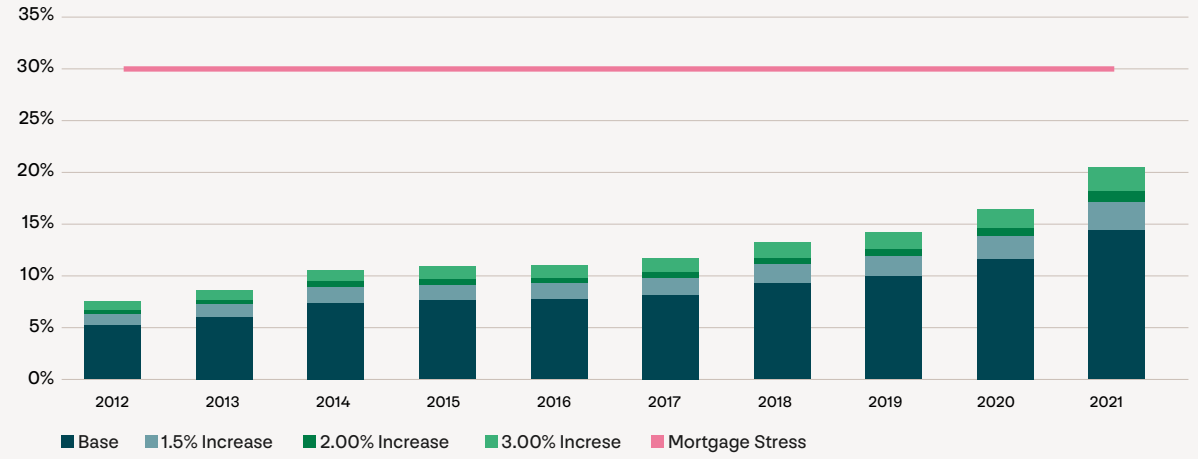


*Share of borrowers that reduce their offset and/or redraw balances over preceding three consecutive months.

Source: RBA; Securitisation System. https://www.rba.gov.au/publications/fsr/2023/apr/household-business-finances.html

FIGURE 3

PRIME MORTGAGE REPAYMENTS AS A PROPORTION OF HOUSEHOLD INCOME



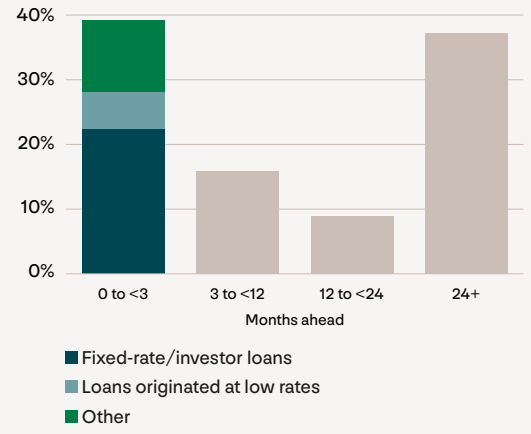
Source: Australian Bureau of Statistics, S&P Global Ratings. Average loan balances used are the average loan balance for each prime RMBS vintage

While cashflow buffers are tight for some, the Australian labour market continues to be extremely tight, with employment close to historical lows at 3.5% (June 2023). The positive of this is that it will provide stressed borrowers with greater opportunities to recalibrate their spending habits and seek additional income via second jobs or better employment terms.

It is worth noting that as a result of their strong liquidity position, not all borrowers will become stressed by the current economic environment. At the aggregate level, at least until the end of 2022, borrowers continued to add to offset and redraw balances despite rising rates. The portion of borrowers three months ahead of their mortgage was over 60% and these levels have largely remained unchanged since cost of living and mortgage repayments started to rise as borrower's benefit from cashflow buffers and are able to adjust discretionary expenditure in the early stages of the hiking cycle. However, as shown below the data is bar-belled, again showing there is an at-risk cohort of just less than 40% of the mortgage market. Although we note that over 20% of these loans are fixed, which will less likely have redraw and offset accounts, and are more likely to maintain liquidity buffers outside their mortgages and have paid lower rates for longer periods relative to a variable rate borrower. It is the borrowers with both cashflow pressures and low liquidity buffers that will drive the current arrears rates.

FIGURE 4

HOUSEHOLD MORTGAGE PREPAYMENTS
Share of loans, by months of prepayments, December 2022



Source: https://www.rba.gov.au/publications/fsr/2023/apr/household-business-finances.html

Impact of fixed rate roll-offs

The other factor at play is the exposure of the mortgage market to fixed rates rolling off to then expose borrowers to significantly higher variable rates. From 2020 through to 2021, there was strong competition between major banks for fixed rate mortgages, enabled by the low cost of funds via the RBA's Term Funding Facility. This resulted in fixed rate loans representing ~38% of outstanding housing credit in early 2022 or roughly twice the usual share prior to the pandemic era. With most fixed rate loans on 1 to 3-year terms, there will still be a proportion of prime borrowers yet to feel the impact of rising rates. We do not expect this to have a large impact on securitisation arrears (as shown above), given fixed rate loans only represent about 6% of prime transactions and 0.2% of non-conforming transactions. However, that is not to say it will not impact the mortgage market and the wider economy, with large, fixed rate rolls offs still to occur in the next 12 months for those with loans from the banks (as shown in figure 4 below). It is estimated that ~90% of borrowers on fixed rate loans will experience an increase in repayments of over 30+ percent. The fixed rate loan cohort is expected to have a slightly larger portion of loans where repayments exceed 30% of household income compared to variable rate borrowers, with the RBA forecasting this may be as high as 25% by the end of 2024. While this will put pressure on household cashflows in the near term with the potential for a cashflow shock, this may be partially offset by higher saving buffers due to paying lower interest rates for longer and greater time to adjust discretionary expenditure in preparation for higher rates. When non-mortgage savings are taken into consideration, fixed rate borrowers private survey data suggests that ~60% of fixed rate borrowers had sufficient liquidity for 12 months' worth of mortgage payments. The fixed roll-off may see a short-term spike in arrears data over the next 6 months but as borrowers adjust expenditure over the longer term, we would expect these loans to perform similarly to the variable rate loans evidenced in the S&P Prime Arrears (see Figure 1).

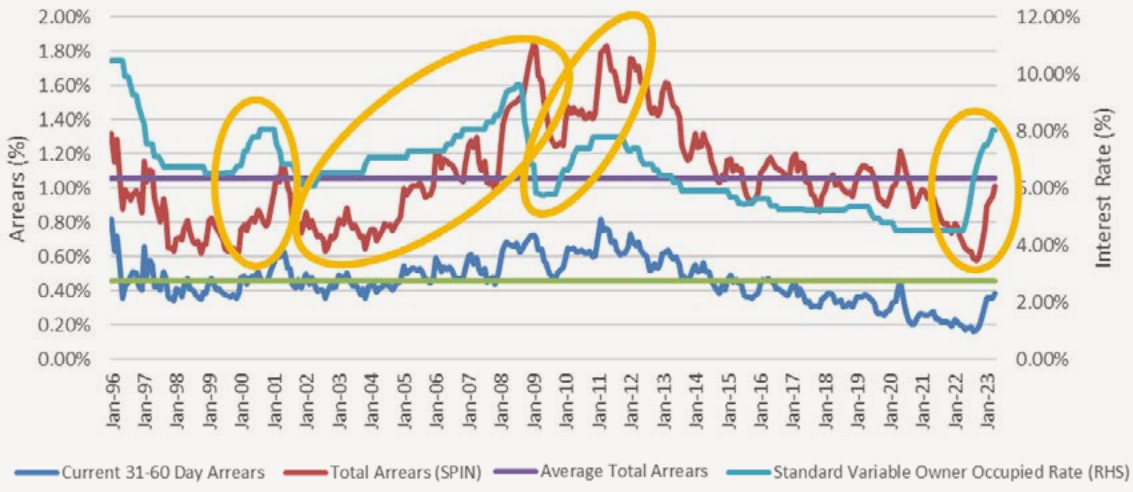
FIGURE 5

AUSTRALIAN MAJOR BANK FIXED RATE ROLL-OFF

Sources: ANZ, NAB, WBC and CBA.

FIGURE 6

PRIME MORTGAGE ARREARS VS VARIABLE MORTGAGE RATES



Source: RMBS Arrears SPIN Statistics: Australia (Excluding Noncapital Market Issurance) June 2023

Historical Analysis and Arrears Outlook for RMBS

Arrears closely follow rate rises. As shown in Figure 6 and Table 1, each period of monetary policy tightening has seen 30+ day arrears climb. Mortgage arrears increased well beyond their long-term averages during 2002-2008 and 2009-2010, in part driven by 3.4% and 2.0% increases in mortgage rates in each period. We have seen a ~4% increase in standard variable mortgage rates over the past 14 months. Interest rate increases of this velocity and scale have not been seen in recent history, with a risk that arrears rates increase closer to historical highs. Past trends suggest that arrears may still increase by a further ~0.9%-1.0%. However, underwriting standards have improved relative to those comparable periods, including the introduction of the National Consumer Credit Protection Act and associated responsible lending obligations in 2009. The introduction of APRA regulated serviceability buffers in 2014 with subsequent increases in 2019 and 2021 and greater restrictions on high debt-to-income lending have also supported improvements in underwriting standards. These standards should result in a more resilient borrower, tempering some of the risk of higher arrears levels relative to historical levels.

From a loss perspective, given the strong security position (first mortgage over residential real estate), losses have been historically limited. For example, between 2008-2013 when arrears were at historical highs in the data set, annual net write-offs averaged only 3 basis points over the period.

Housing Outlook

Australian house prices have returned to growth in recent months after steadily declining from their Q2 2022 peak. Since its trough in February, Corelogic's National Home Value index is up 3.4%, with growth driven by a significant supply and demand imbalance that exists in the Australian housing market.

Total listings are 18.0% below this time last year and 9.8% below the 5-year average, despite actual sales activity being broadly in line with long-term averages. This supply and demand imbalance is expected to be exacerbated by stronger immigration into Australia and residential construction costs restricting new builds.

Despite the recent growth, dwelling prices are still below their 2022 peaks in all major cities. We remain cautious on the outlook for housing. Risks of further interest rate hikes and the deteriorating economy, coupled with rising unemployment may see buyers' borrowing capacity continue to be restricted. Rises in available supply may also be a factor, driven both by homeowners willing to sell off the back of the recent increases and distressed sales by borrowers under financial stress.

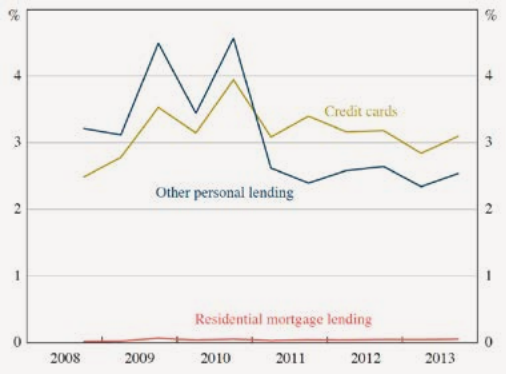
TABLE 1

Period	Change in Variable Interest Rates	Peak to Trough change in 30+ day arrears
Sep 1999 – Aug 2000	+1.5%	+0.5%
Apr 2002 – Aug 2008	+3.4%	+1.2%
Sep 2009 – Dec 2010	+2.0%	+0.6%
Current	+4.0%	+0.4% (to April 2023)

Source: IFM Investors

FIGURE 7

CREDIT LOSSES BY PORTFOLIO
Consolidated data for three major banks, annual net write-off ratios



Source: https://www.rba.gov.au/publications/rdp/2015/pdf/rdp2015-06.pdf

FIGURE 8

TOTAL LISTINGS HAVE FALLEN

Source: https://www.corelogic.com.au/__data/assets/pdf_file/0016/15910/CoreLogic-HVI-Jul-2023-FINAL.pdf

While there is a risk of further house price declines, the recent peak-to-trough movements detailed in Table 1 show that the recent price declines do not offset the strong property price appreciation that was witnessed from the start of the pandemic to early/mid-2022 supporting loans originated prior to 2020. Borrowers are at a higher risk of negative equity where the loan was originated between 2021 to early 2022 with LVR's in excess of ~85%. Origination of these loans has historically represented only a small portion of RMBS loan pools with current exposure ~3.4% but lenders will benefit from LMI providing strong loss protection on higher LVR lending.

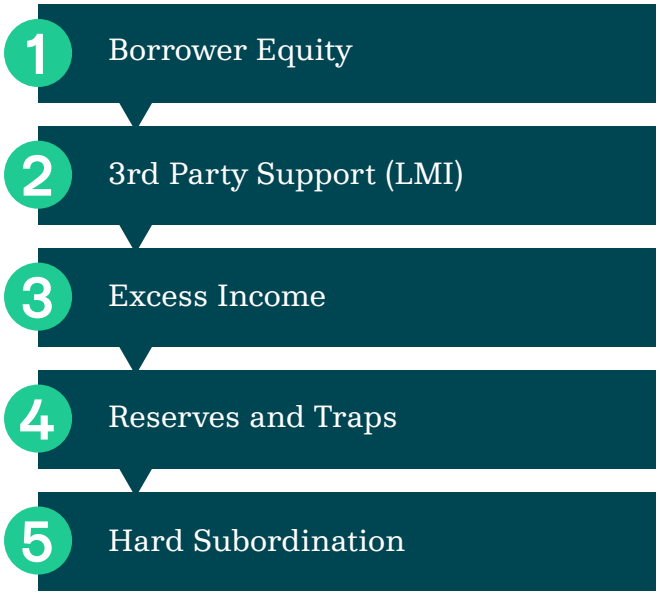
FIGURE 9

Geography	Onset of COVID to Cycle Peak	Date of Peak	Recent Peak to Trough	Date of recent Trough	Recent Trough to Current	Net increase/ Decrease since COVID
Sydney	24.5%	Jan-22	-13.8%	Jan-23	5.7%	13.2%
Melbourne	10.7%	Feb-22	-9.6%	Feb-23	1.8%	2.1%
Brisbane	41.8%	Jun-22	-11.0%	Feb-23	2.8%	27.4%
Adelaide	44.7%	Jul-22	-2.4%	Mar-23	1.9%	40.6%
Perth	24.3%	Jul-22	-0.9%	Feb-23	2.9%	16.8%

Source: https://www.corelogic.com.au/__data/assets/pdf_file/0029/14978/CoreLogic-HVI-JUN-2023-FINAL.pdf

RMBS Structural Protections

RMBS transactions are backed by a large and diversified pool of borrower loans. Loan pools typically have greater than 750 individual obligors which are geographically and demographically diversified, limiting the risk of large, concentrated defaults within the transaction. Where a borrower within the loan pool does default, losses incurred by the lender may result in a principal charge-off on the notes. However, RMBS structures will also benefit from several layers of structural protection which will have to be exhausted prior to this occurring. These protections are detailed below:



1 Borrower Equity

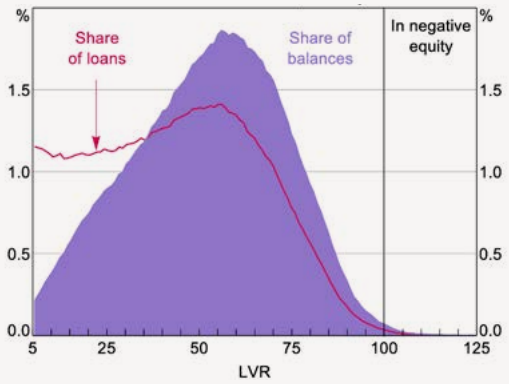
The first layer of credit protection against a loss occurring and being allocated to the RMBS is the borrower's equity in the property. Following borrower default and enforcement if the proceeds from the sale of the property exceed the loan amount, selling costs and carrying costs, no losses will be incurred by the RMBS transaction. This credit protection generally increases over time due to house price appreciation and principal repayments, but this buffer has been partially impacted by declining home valuations triggered by monetary policy tightening. Loans with a higher loan to value ratio (LVR) or less equity in the property are at greater risk of loss on default. However, they only represent a small portion of loan pools. In January 2023, the RBA estimated that only 2% of loans had an LVR of >90% and loans with LVRs >100% remain negligible (refer to Figure 10).

2 Third Party (LMI) Support

Several RMBS transactions also benefit from Lender's Mortgage Insurance ("LMI") coverage on loans. Lender's Mortgage insurance is common on prime mortgages with an LVR exceeding 80%, so it will provide added protection against loans at a higher risk of loss on default. In Australia, Lender's Mortgage Insurance is typically provided by 'A' rated insurers including Helia Insurance Pty Ltd (formerly Genworth) and QBE Lenders Mortgage Insurance Ltd. These providers will typically cover losses on foreclosure subject to some exclusions beyond hard dollar caps for unpaid interest, fees, marketing costs and legal costs in foreclosure. In more extreme economic scenarios, particularly where stresses exceed defaults and losses applicable to an A rated stress or above, an LMI provider's ability to continue to meet its obligations to lenders will be dependent on the ability of insurance providers to withstand elevated levels of claims.

FIGURE 10

OUTSTANDING LVR DISTRIBUTION*
Share of loans and balances, January 2023**



* Loan balances adjusted for redraw and offset account balances; property prices estimated using SA3 price indices.

** Excluding LVR < 5 per cent

Source: ABS, CoreLogic; RBA; Securitisation System

3 Excess Income

Losses will start to be allocated to the RMBS transaction if there is still a loss after foreclosure and any applicable LMI coverage but these losses may be met through the application of the current month's excess spread. Excess spread is the remaining income post the trust operation and financing costs, which is the RMBS issuer's profit. So instead of the principal loss on the mortgage being directly applied to charge-off the notes, the RMBS issuer's profit is reduced and these excess income amounts will be used to protect the noteholders. Further, where losses have been allocated to notes, excess spread in subsequent periods will first be used to reinstate noteholders prior to distributing to the originator.

4 Reserves and Traps

Depending on the transaction, RMBS deals may also feature cash reserves that are funded upfront, or which build up over time by trapping excess spread distributions (usually subject to a performance-based triggers, such as arrears or losses exceeding a particular level) or benefit from over-collateralisation. This typically occurs when excess income is used to accelerate the repayment of notes. If applicable to the deal, these features can be used to cover losses that exceed monthly excess spread.

5 Hard Subordination

Lastly, if the loss is not cured by the application of the above protections, it is only then that the loss will be allocated to the notes in reverse order of seniority. The amount of subordination on any particular note is based on the expected loss performance of the portfolio of mortgages in various economic stress scenarios (probability of default x loss given default). This loss protection will be captured in the investment's credit rating, which range from AAA, which is designed to protect against an extreme level of economic stress, down to B, which will provide protection against a relatively mild economic downturn. In addition, the originator of the mortgage loans will typically be required to fund and hold the most subordinated note within the RMBS structure, which incentivises them to maintain the performance of the mortgage portfolio and limit losses in the RMBS transaction.

Transaction Modelling

In the subsequent section, we cashflow-model a recent prime RMBS transaction to give life to the above structural protections. Various stress scenarios can be used to determine what level of mortgagor defaults and peak-to-trough market value declines would be required prior to realising an unreimbursed loss on each of the rated notes within the transaction.

We have run mortgagor defaults of between 2% to 22% and peak-to-trough market value declines of between 5% and 45%. Our assumptions surrounding mortgagor defaults and market value decline stresses that we have modelled are detailed below, and several other assumptions are required to cashflow model this transaction, which are detailed in Appendix 1.

Mortgagor Default Assumptions

The below analysis runs multiple scenarios altering the percentage of the pool balance that defaults over the life of the transaction. We have segmented the loan portfolio into five borrower risk cohorts from lowest to highest risk of default to determine which loans will default within the transaction.

For the purpose of this analysis, we assessed the probability of default of each loan in the pool using six different loan characteristics that are key drivers of a borrower's probability of default and applied default factors in accordance with S&P rating criteria. This included current LVR, loan seasoning, repayment type (interest only or principal interest), borrower type (owner occupier or investor loan), prior credit events and employment type (self-employed or PAYG).

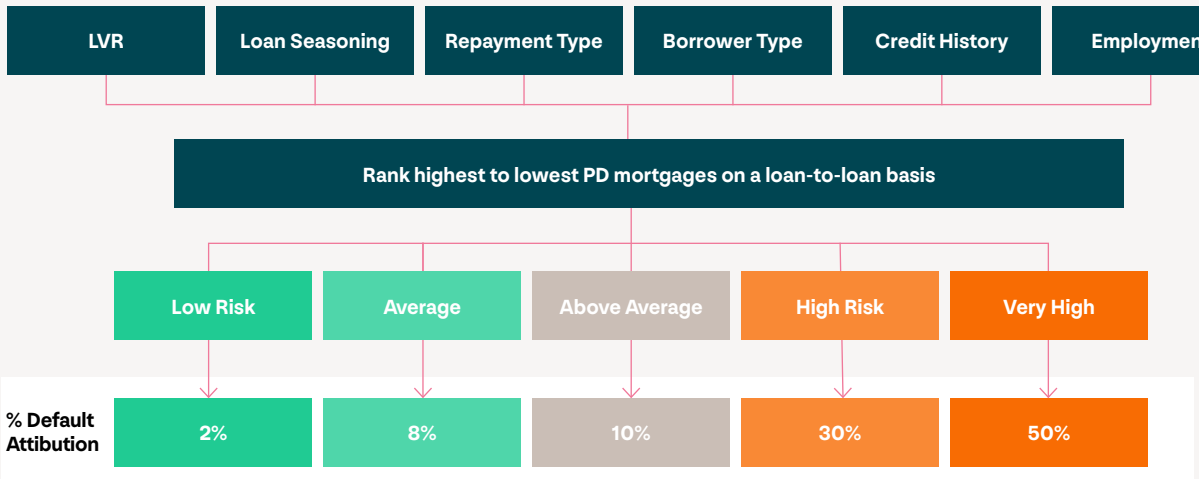
Once bucketed, most loan defaults are attributed to higher-risk loan categories, with only a small number of loans in the low-risk category defaulting. For example, 50% of total defaults are applied to loans bucketed in the very high-risk loan category where only 2% of gross defaults are attributed to loans in the low-risk category.

Market Value Decline

The housing market peaked in April 2022, with more conservative forecasts last year predicting peak-to-trough declines of circa 20%. Since peak we have seen house prices decline by 9.6%, with stability in prices seen in recent months. In our analysis we have stressed the transaction under multiple peak to decline market value scenarios from 5% all the way up to 45%. We note, however, that the market value decline will probably be closely tied to the level of consumer defaults, so some stresses assessed below will be less likely to play out than others.

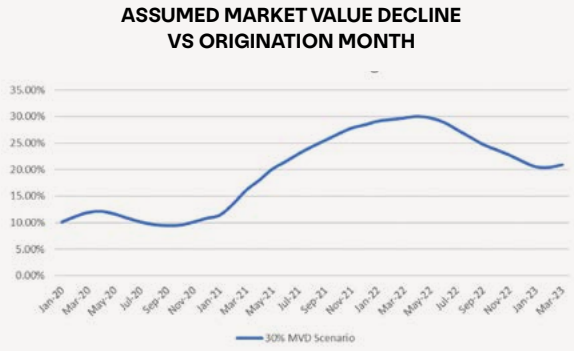
In applying the market value decline stresses across the portfolio, we have assumed that the peak of the housing market was in April 2022. Therefore, any loan that was originated in April 2022 is attributed the full peak-to-trough valuation decline when determining the loss on default. If a loan was originated before or after April 2022, we have offset the market value decline against any property price appreciation or decline that has occurred between April 2022 and the time the loan was originated. For example, a loan originated in January 2021 benefited from ~19.2% property price appreciation prior to peak, so we have only applied a market value decline of the peak assumption less 19.2%. Figure 12 shows an example of the 30% market value decline stress and how it is applied to loans originated in each month.

FIGURE 11



Source: IFM Investors

FIGURE 12



Source: IFM Investors

Our Findings

Figure 13 shows the level of mortgagor defaults and market value decline that is required to occur under our cashflow modelling prior to a principal loss being occurred on each of the rated notes within the transaction.

Take for example the notes rated B by S&P in this transaction. Principal loss occurs on these notes in our modelling under all scenarios marked B as well as all other scenarios that result in a principal charge-off of a higher-rated note. For example, if peak-to-trough market value decline was 30% then 4% of the initial loan pool would have to default prior to there being a principal loss on the B rated note. If market value decline was only 15%, however, then 8% defaults would be required prior to principal loss. This shows that there is a combination of both mortgagor default and market value decline that may lead to charge-offs on a rated note.

Higher-rated notes such as BBB benefit from greater note subordination and as a result require significantly more consumer defaults and larger market value declines prior to a loss being incurred. These results may vary for other transactions and will be dependent on the structural mitigants referred to above that feature within the transaction.

Historically, peak to trough market value declines have not exceeded 10% (see Figure 14) and the level of prime arrears (a precursor to default) have not exceeded 2%. Further, in the modelled transaction we observe that the B-rated note only starts to experience a loss when net losses (gross loss less recoveries) exceeded 0.62%, comparing favourably to the historical net loss experienced by a number of non-bank prime originators of between 0.0% and 0.1% over a long history.

FIGURE 13

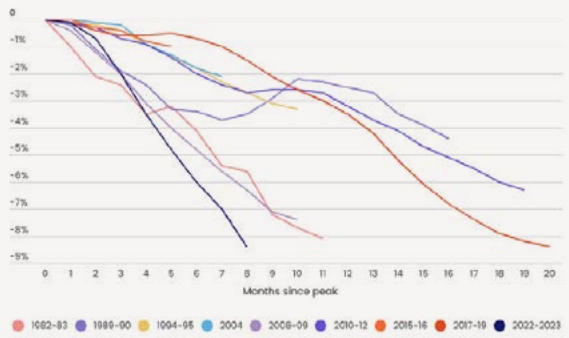
Assumed Mortgagor Default %

Modelled Peak to Trough Market Value Decline	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%	22%
5%							B	B	BB	BB	BB
10%					B	B	B	BB	BB	BB	BB
15%				B	BB	BB	BB	BBB	BBB	BBB	BBB
20%			B	BB	BB	BBB	BBB	BBB	BBB	A	A
25%			BB	BB	BBB	BBB	BBB	A	A	A	A
30%		B	BB	BBB	BBB	BBB	A	A	A	AA	AA
35%		B	BB	BBB	BBB	A	A	A	AA	AA	AA
40%		BB	BBB	BBB	A	A	A	AA	AA	AA	AA
45%		BB	BBB	A	A	A	AA	AA	AA	AA	AAA

Source: IFM Investors

FIGURE 14

NATIONAL HOME VALUES HISTORIC PERIODS OF DECLINE



Source: CoreLogic - Australian home values officially record the largest decline on record

Conclusion

As detailed in the beginning of this paper, the pressures being put on household balance sheets continue to rise, which we believe will lead to higher levels of arrears and defaults – particularly in CY2021/2022 originated mortgage loans, given the ultra-low underwrite rates that were in use at the time (assumed mortgage interest rate for serviceability was typically 5.0-5.5%).

Over this period IFM has been conducting loan-level interest rate stresses to better predict where future losses could be elevated and has adjusted its risk appetite for RMBS transactions. Where appropriate, we have been selectively positioning in tranches with greater ability to absorb higher economic stresses.

Notwithstanding the negative outlook, our analysis shows that the structural protections afforded to investors are relatively resilient to a moderate downturn in collateral performance.

FIGURE 15

S&P PRIME SPIN INDEX

Source: https://www.spglobal.com/ratings/en/research/pdf-articles/230111-australian-rmbs-arrears-spin-statistics-november-2022-exc-non-capital-market-issuance-

Appendix 1

Cashflow Assumption	Modelled
Collateral Type	Australian Prime Residential Mortgages – mixed full documentation and alternative documentation.
Amortisation Profile	Fully amortised assuming the average repayment profile of the portfolio.
CPR	Based on marketing assumptions of the reference transaction.
Call Option	Transaction is not called with deal amortising through to legal maturity.
Portfolio Yield	Loans generate the weighted average yield of the portfolio. Any increases in base rates are passed through to the end customer.
Threshold Rate	No benefit given to the Threshold Rate.
Liquidity Support	Note interest repayments are supported by liquidity facility and principal draws that feature in the transaction.
Enforcement Expenses	Variable selling costs of 5% of the property price, fixed selling costs of $5,000 and average time to foreclose of 15 months. Default interest applicable to the loans in default.
LMI Payout	Loans covered by LMI that transition to default a quarter will receive a 95% payout ratio, the next quarter 85%, the next quarter 75% and the remaining only 65%.
Timing of Loss	S&P prime base case default timing assumptions which based on historical LMI data assumes that a majority of mortgage defaults occur in the first 5 years.
Arrears	New arrears are applied at 2.5x the monthly default rate and take 4 months to cure.

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