HOUSEHOLD DEBT AND FINANCIAL STRESS – AUGUST 2018

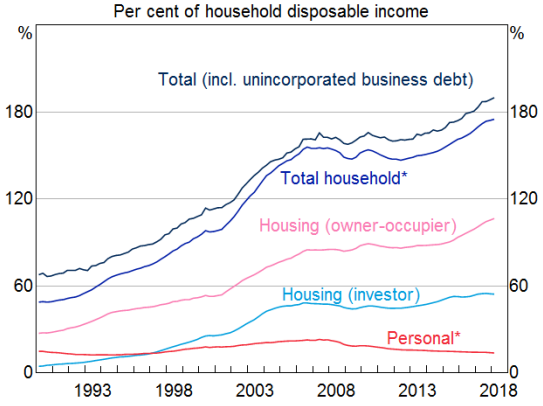
Household debt

- Household debt-to-income has drifted up, to 190 per cent (Graph 1 - broad measure, includes debt of unincorporated enterprises, new migrants' offshore debt, HECS and to non-financials).
- More frequently we cite *housing* debt-to-income which has increased to over 140 per cent (up 23 percentage points over five years) (Graph 2);
  - *net of offset accounts* this is around 130 per cent (up 16 percentage points over five years).
- High income and wealthy households hold a large proportion of household debt (Graph 3). In 2015-16 the top income quintile accounted for about 40 per cent of total debt and the top wealth quintile owed one-third of total debt; this share has been stable over time.
- Debt servicing ratios have been broadly steady: falling rates offset rising debt.
- Aggregate mortgage prepayments (offsets and redraws) are equivalent to 18 per cent of outstanding mortgages and nearly 3 years of scheduled repayments at current interest rates (Graph 4).
  - One-third have no buffer: many are investors, on fixed-rate or new borrowers.
  - Largest buffers typically: wealthier, higher income and more seasoned mortgages.

Graph 1

Household Debt

Per cent of household disposable income

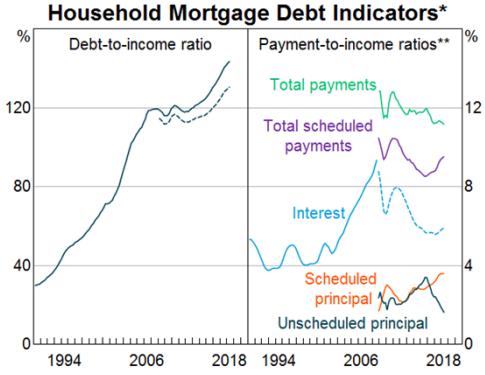


* Excludes debt owed to non-financial organisations e.g. HECS

Sources: ABS; APRA; RBA

Graph 2

Household Mortgage Debt Indicators*



* Excludes non-housing debt; debt-to-income line nets out amounts in redraw facilities; dotted lines are calculations based on debt balances which also exclude offset accounts; income is household disposable income before housing interest costs and is estimated for the June quarter 2018

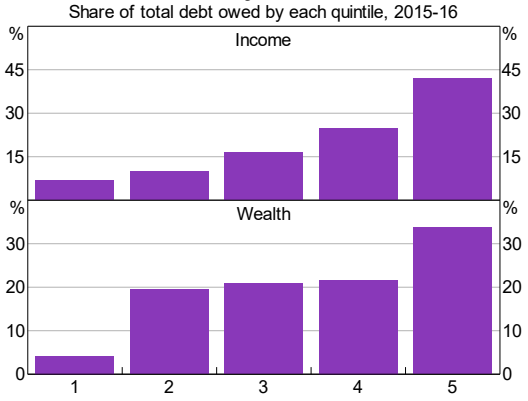
** Rolling four-quarter average; unscheduled principal is the change in aggregate mortgage prepayments

Sources: ABS; APRA; RBA

Graph 3

Household Debt by Income and Wealth

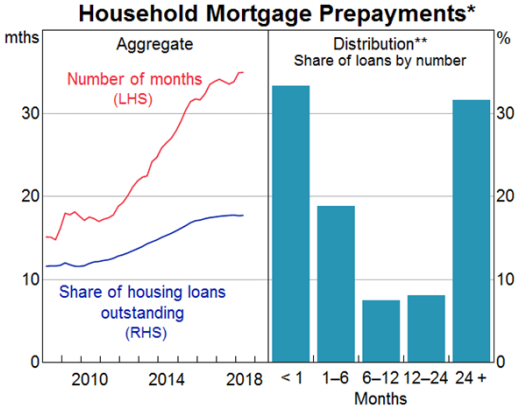
Share of total debt owed by each quintile, 2015-16



Source: ABS

Graph 4

Household Mortgage Prepayments*



* Available redraw plus offset account balances

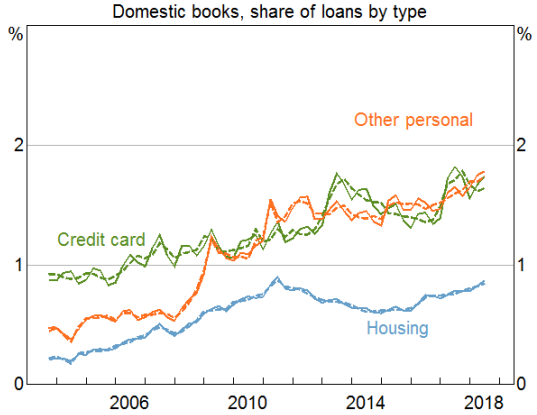
** As at January 2018

Sources: APRA; RBA; Securitisation System

Household financial stress

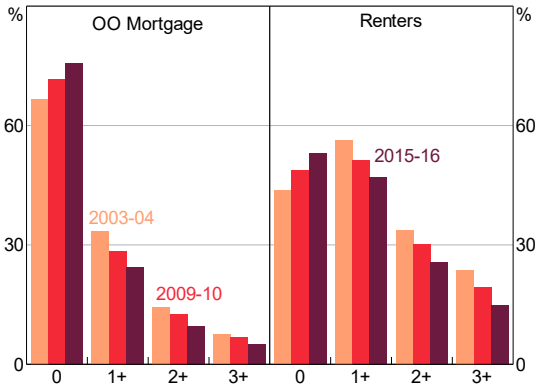
- The housing non-performing loan (NPL) ratio has increased since the end of 2015 (mostly WA), but remains below the most recent peak in 2011 (Graphs 5 and 6).
- NPL ratios for personal loans and credit cards remain high relative to recent history (personal credit is only about 4 per cent of banks' household lending).
- Broad data sources suggest the number of households experiencing financial stress has fallen over the past decade, but there are regional variations.
    - Household Expenditure Survey (2015/16): the number of households experiencing financial stress has fallen steadily since the mid-2000s (Graph 7).
    - HILDA (2016): measures of financial stress are little changed over the decade and are lower than the early 2000s (Graph 8).
- ASIC's recent report on credit cards links problematic debt with multiple credit card usage, corroborating messages from liaison (but overall more households are paying off each month).
- Some private surveys point to rising mortgage stress. These surveys are timely but their methodologies often seem to overstate financial stress (e.g. using actual, rather than required mortgage payments, which include prepayments).

Graph 5
Banks' Non-performing Household Loans*
Domestic books, share of loans by type



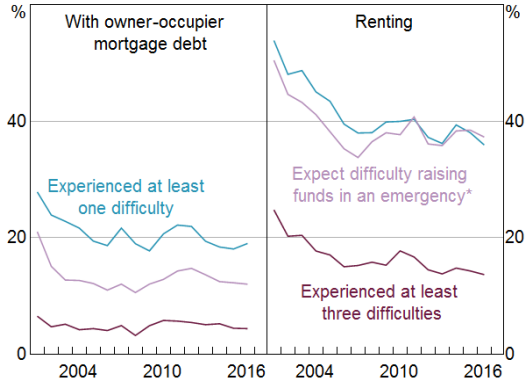
* Dashed lines represent seasonally adjusted data
Sources: APRA; RBA

Graph 7
Number of Financial Stress Events
Share of households



Source: ABS

Graph 8
Incidence of Financial Stress
Share of households



* $2 000 before 2009 and $3 000 from 2009 onwards
Sources: HILDA Release 16.0; RBA

Interest-only (IO) loan expiries

- Concerns about stress when IO loan converts to a principal-and-interest (P&I) loan.
  - Required repayments are estimated to increase by 30-40 per cent (about $7,000 per year) for a 'representative' interest-only borrower with a $400,000 mortgage converting to P&I.
- Based on loans in the Securitisation Dataset, a large share of borrowers should qualify for an IO extension or could refinance with a different lender.
- Borrowers that can't meet new lending standards and are unable to service P&I repayments might sell their properties or default. We estimate this is a small group (eg borrowers with multiple highly leveraged investment properties).
- Tighter lending standards are unlikely to bind for borrowers that:
  - Undertook a serviceability assessment at loan origination that already took into account the step up in repayments at the end of the interest-only periods (as APRA has required for all such assessments since end 2014);
  - Did not borrow (close to) the maximum loan size available to them;
  - Have experienced income growth since the loan was originated;
  - Have made prepayments on their loans; and/or
  - Were assessed for their original loans at significantly higher interest rates than current assessment rates.
- Most borrowers will have positive equity given the rate of housing price growth over the last five years.

Households Businesses and Credit
Financial Stability Department
7 August 2018

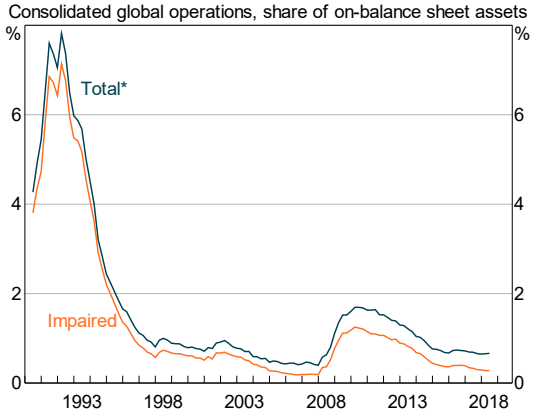
BANKS' NON-PERFORMING ASSETS – JUNE QUARTER 2018

Summary

- Banks' non-performing asset (NPA) ratio and the share of impaired assets on a consolidated basis remained steady in the June quarter (Graph 1).[1]
- On a domestic-books basis, the NPA ratio increased slightly, as non-performing loans (NPLs) for housing and personal lending resumed their recent upward trends (Graph 2; Table 1).

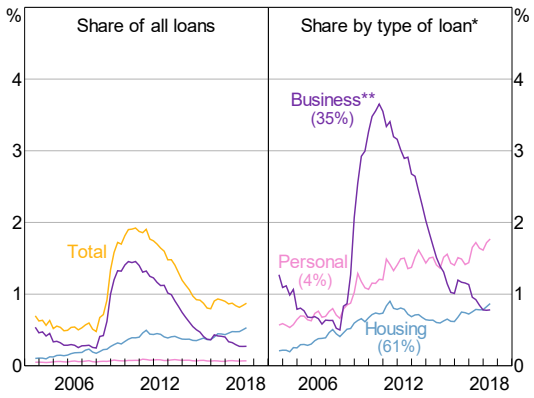
- This note also contains some analysis on non-performing loans using the new Residential Mortgage Lending form collected by APRA (ARF 223.0).

Graph 1
Banks' Non-performing Assets
Consolidated global operations, share of on-balance sheet assets



* Includes assets 90+ days past due that are well secured
Source: APRA

Graph 2
Banks' Non-performing Assets
Domestic books



* Each category's share of total domestic lending at June 2018 is shown in parentheses
** Includes lending to financial businesses, bills, debt securities and other non-household loans
Sources: APRA; RBA

Domestic asset performance[1]

- The flow of new impaired assets relative to outstanding assets increased over the June quarter (Graph 3).

Households

- The domestic housing NPL ratio increased slightly in the June quarter, with NPL ratios increasing for both owner-occupier and investor loans. While past-due ratios for domestic housing loans accounted for the majority of the increase, the share of impaired housing loans has also picked up (Graph 4).[2]
- Banks in liaison with the RBA attributed the recent deterioration in housing loan arrears rates to a natural rise from a very low base, the mathematical effect of slowing credit growth and a temporary impact from maturing IO loans.
- Back-of-the-envelope calculations suggest that the effect of the slowing in housing credit growth on housing NPL ratios has been small. In a scenario where housing credit growth was maintained at its late 2015 peak, the NPL rate for housing would be around 4-5 bps lower at the end point (Graph 5).[3]
- Net write-offs, relative to outstanding mortgages, ticked up in the quarter.
- By state, the share of housing loans that are non-performing remain highest in Western Australia; housing NPL ratios have picked up marginally in other states, albeit from a much lower base (Graph 6).
- The major banks' latest public disclosures also show that 90+ day arrears rates for housing loans remain elevated in WA relative to other states (Graph 7; Graph 8).[4]

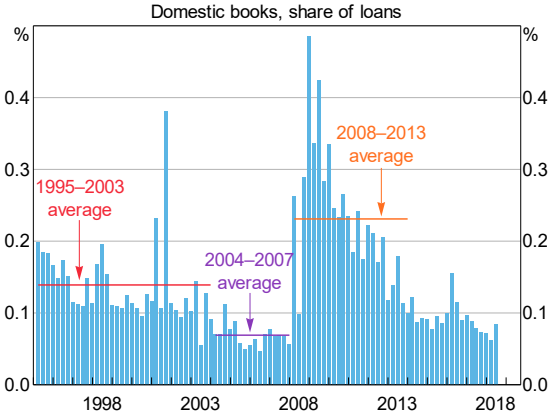
---

1 The term "NPA rate" is used when the asset class includes non-loan items such as bills and debt securities issued by businesses. The term "NPL rate" is used when the asset class comprises just loans, which is typically the case for loans to households.
2 Previous FS work has found evidence of seasonality in some types of household loans, particularly personal loans and owner-occupier housing loans. NPLs tend to seasonally increase over the first half of the year and decline in the second half. For further details, see Kamil (2014).
3 See Appendix B for details about how this estimate was calculated.
4 See CBA Investor Presentation – June 2018 and WBC Capital, Funding and Credit Quality Update – August 2018

Graph 3

Banks' New Domestic Impaired Assets

Domestic books, share of loans

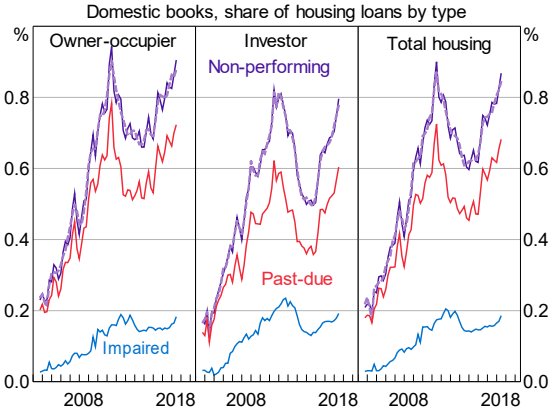


Source: APRA

Graph 4

Banks' Non-performing Housing Loans*

Domestic books, share of housing loans by type

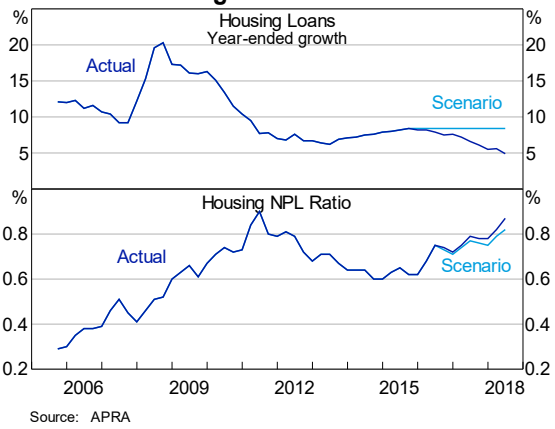


* Dashed lines are seasonally adjusted

Sources: APRA; RBA

Graph 5

Housing Credit Scenario



Source: APRA

APRA's New Residential Mortgage Lending Form (ARF 223)

A new dataset on residential mortgage lending was collected by APRA for the first time in the March quarter. This includes new data breakdowns (see ADIs' Housing Loan Characteristics - June Quarter 2018), including some on non-performing loans. Some highlights from this quarter include:

- The non-performing housing loans ratio from the new form remains broadly consistent with the non-performing housing loans ratio from the existing data we receive on banks' asset performance (ARF 220.0). [5] NPL ratios for both owner occupier and investor loans increased slightly in the quarter, in line with increases in the equivalent ratios from ARF 220.0 (Table 1).
- NPL ratios for P&I loans remain higher than those for IO loans; this data records the current loan type, which may differ to what it was at origination (i.e. an IO loan which has switched to P&I is recorded as a P&I loan) (Table 1).
- The NPL ratio for low-doc housing loans (i.e. loans where the income of the borrower has not been fully verified) increased by 16 bps in the quarter with this increase being driven by one major bank. Currently, around 2 ½ per cent of low-doc housing loans are non-performing.
- Non-performance is highest for housing loans funded more than 5 years ago. CBA noted in their latest public disclosures that performance of more recently written housing loans remained strong (Graph 11).
- The 30+ day delinquency rate for the June quarter is 1.52 per cent. As a time series develops, this should provide a more timely indicator of changes in asset quality.
- NPL ratios are lower for loans in <80 LVR category and tend to increase as the LVR increases (Table 2).

5 The loans in ARF 223 are secured by residential housing within Australia only, whereas there are no constraints on the location of the collateral underlying loans in ARF 220.0.

Table 1

Banks' Non-Performing Housing Loans Data

June Quarter 2018*

	Non-performing loans	Qtrly change	Amount	Qtrly change	Loan type as a share of all loans
	(%)	bps	$b	$b	(%)
	Share by loan type				
Credit outstanding secured by residential property in Australia	0.80	3	14.0	0.8	**100.0**
Owner-occupier	0.84	3	8.8	0.5	**60.6**
Interest-only	0.69	5	1.2	0.0	10.1
Principal & interest	0.87	2	7.6	0.5	50.5
Broker-originated	0.86	3	4.5	0.3	30.1
Investor	0.70	5	3.9	0.3	**32.6**
Interest-only	0.49	4	1.4	0.1	16.8
Principal & interest	0.91	3	2.5	0.2	15.8
Broker-originated	0.73	4	2.1	0.1	16.5

* Includes foreign subsidiaries and branches

Table 2

NPL ratios by LVR (%)

LVR for term loans outstanding

June Quarter 2018*

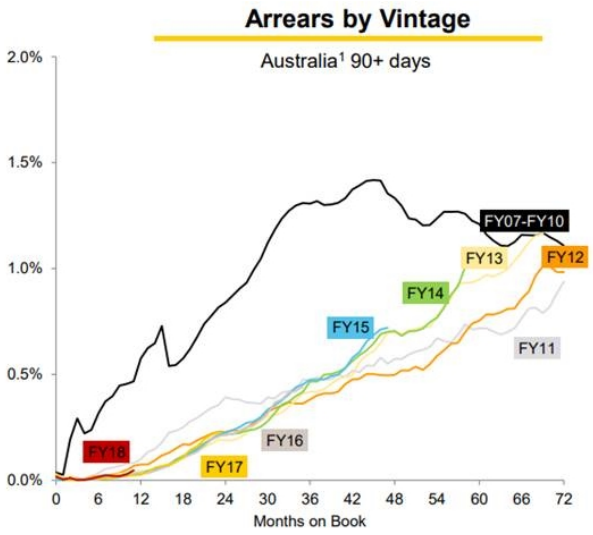
<60	60 to <80	80 to <85	85 to <90	90 to <95	>=95	>=80
0.5	0.6	1.2	1.2	1.7	6.0	1.7
(1)	(3)	(10)	(6)	(16)	(45)	(11)

* Quarterly change in brackets (bps)

Sources: APRA (ARF 223); RBA

Graph 11

Housing Loans



Source: CBA

Zoya Dhillon
Households, Businesses and Credit
Financial Stability Department
5 September 2018

Appendix A

Table 2: Banks' Non-performing Domestic Assets
Domestic books

	Share by loan type		Share of all loans		Amount		*Memo: loan type as share of all loans* [(a)]
	Per cent	Bps	Per cent	Bps	$b	$b	*Per cent*
	Jun-18	Qtrly chg	Jun-18	Qtrly chg	Jun-18	Mar-18	Jun-18
Housing	**0.87**	**4**	**0.53**	**2.8**	**14.2**	**13.4**	***61***
Owner-occupier	0.91	4	0.37	1.9	9.8	9.2	*40*
Investor	0.80	5	0.17	0.9	4.4	4.2	*21*

(a) On-balance sheet credit as at June 2018

Sources: APRA; RBA

Appendix B: Housing Credit Scenario

To estimate the effect of the recent slowing in housing credit growth on the housing NPL ratio we used two approaches:

Approach 1 considers a scenario where housing credit growth maintains its late 2015 peak. This approach assumes that new loans written since late 2015 have not entered arrears. This gives a housing NPL rate that is 5 bps lower than the actual NPL rate at the latest data point (Graph 5).

Approach 2 takes account of the life cycle of the loan and the fact that new loans typically have lower arrears rates than older loans. From the securitisation database, we have average arrears rates for loans of different ages. These arrears rates are applied to the incremental credit growth in our scenario. This is done on a quarterly basis from late 2015 with the average arrears rate for each loan cohort growing with the age of the loan. These additional loans in arrears are then added to the actual number of loans in arrears as at June 2018 to calculate a new NPL ratio. This approach gives a housing NPL rate that is 4 bps lower than the actual NPL rate at the latest data point.

From: SHANAHAN, Ben
Sent: Tuesday, 6 November 2018 10:33 AM
To: DE ATHOLIA, Timoth; ROSEWALL, Tom
Cc: FS - HBC Management; RYAN, Paul; DHILLON, Zoya
Subject: RE: Perth units look very soft! [SEC=UNCLASSIFIED]

I would suggest chatting to Michelle B. She's done the most work using the sec system data to model arrears by loan characteristics (of which LVR is a key characteristic).

One thing I can offer is new aggregate data on NPL rates by LVR (from the new APRA ARF 223 form). The NPL rate rises with LVR (second last row) and really jacks up for very high LVR loans i.e. more than 500bps higher than the population. Almost 13 per cent of non-performing loans have LVR of 95+ despite only around 1½ per cent of all loans having LVR at this level.

Loans outstanding by LVR bucket (JQ 2018):

	<60	60 to <80	80 to <85	85 to <90	90 to <95	>=95	Missing	>80
Total	30.4	46.3	9.3	7.4	4.7	1.7	0.3	23.0
OO	29.9	46.0	8.4	8.4	5.5	1.7	0.1	23.9
INV	30.4	47.1	11.1	5.8	3.5	1.7	0.4	22.1
Broker	25.6	47.0	11.2	8.4	6.0	1.8	0.0	27.4
NPL Rate (% of loans in LVR bucket)	0.45	0.57	1.23	1.21	1.74	6.04	0.67	
NPL (Share of total non-performing loans)	17.5	33.3	14.5	11.4	10.3	12.7	0.3	

However, your question is probably around the extent to which having a high LVR *causes* a loan to be non-performing. But, this data will include some loans where being non-performing has *caused* the high LVR. Two things drive this reverse causation:

1. NPL (non-performing loan) = loans 90+ days in arrears *and* impaired loans. Impaired loans are those that are considered in doubt by the lender (for any reason) AND are not well secured. By definition 'not well secured' means LVR >100. Therefore, impaired loans by definition have high LVR and thus the high LVR category has a higher NPL rate than the broader population
2. Exit of low LVR NPLs. A low(er) LVR loan that is in arrears can be resolved by the borrower selling the property. At this point the loan would leave the pool of NPLs and thus drive the average LVR of remaining NPLs higher. On the other hand, 100+ LVR loans can't be resolved through selling and the bank is less likely to allow time/leniency for the loan to cure and more likely to initiate mortgagee in possession procedures. All this will cause low LVR NPLs to remain in the arrears pool for less time relative to high LVR loans and thus drive the average LVR of NPLs higher.

So, while higher initial LVR is associated with higher probability of default (see Michelle B), it is worth being mindful that some of the correlation between arrears and NPLs in the aggregate data may reflect reverse causation and so may give the impression of a stronger relationship than is actually the case.

Cheers,
Ben

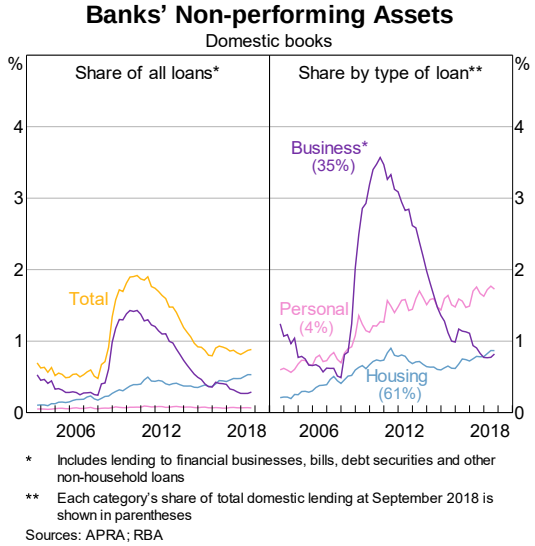
BANKS' NON-PERFORMING ASSETS – SEPTEMBER QUARTER 2018

Summary

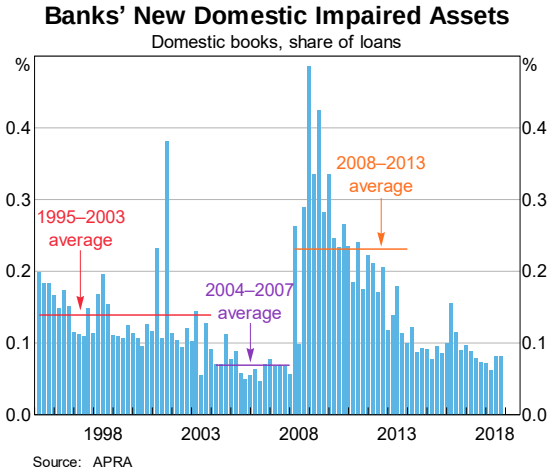
- Although the share of housing loans that are non-performing (NPLs) was unchanged in the quarter, the housing NPL ratio remains close to its GFC peak, driven by underperformance in Western Australia.
- Consistent with our priors, new APRA data show higher rates of non-performance for some types of housing loans, including those with very high LVRs, loans to non-residents, low-documentation loans, principal and interest loans and loans older than 5 years.

Banks' Non-Performing Domestic Assets – Housing Loans

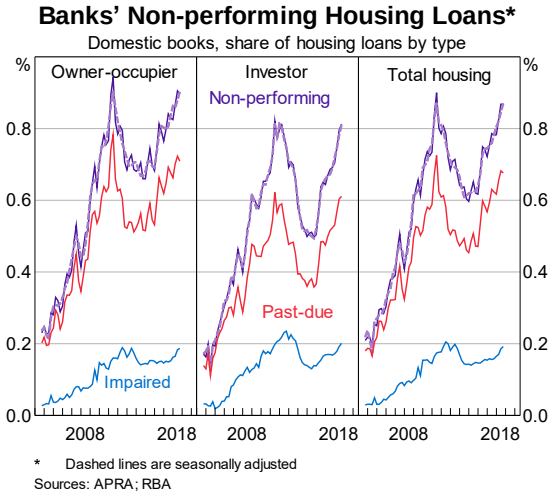
G1 : Banks' total non-performing asset rate was unchanged at 0.88 per cent in September.[1]



G2 : The flow of new impaired assets relative to outstanding assets was unchanged over the September quarter.



G3 : The domestic housing NPL ratio was unchanged in the September; a small pick up in the share of impaired housing loans was offset by an equivalent decline in the share of past due housing loans. There was a marginal increase in the NPL ratio for investor loans which was partly driven by a quarterly decline in the denominator.



For detail at the aggregate level, see Appendix A.

1 The term "NPA rate" is used when the asset class includes non-loan items such as bills and debt securities issued by businesses. The term "NPL rate" is used when the asset class comprises just loans, which is typically the case for loans to households.

APRA's New Residential Mortgage Lending Form – Early Insights

A new dataset on residential mortgage lending was collected by APRA for the first time in the March quarter 2018 (ARF 223). This includes new data breakdowns

including some more granular data on non-performing housing loans than what was previously available. It is important to note however, that these new data are currently in their preliminary stages of reporting, with some smaller banks still reporting on a best endeavours basis. As such, they are intended to complement the existing asset quality data from ARF 220.0 rather than replace it. Nevertheless, the data are consistent with our priors.

Table 1: NPL ratios are lower for loans in <80 LVR category and tend to increase as the LVR increases. Around 12 per cent of non-performing loans fall in the >=95 LVR category. This is likely to include the vast majority of impaired loans (i.e. loans that are not well secured).

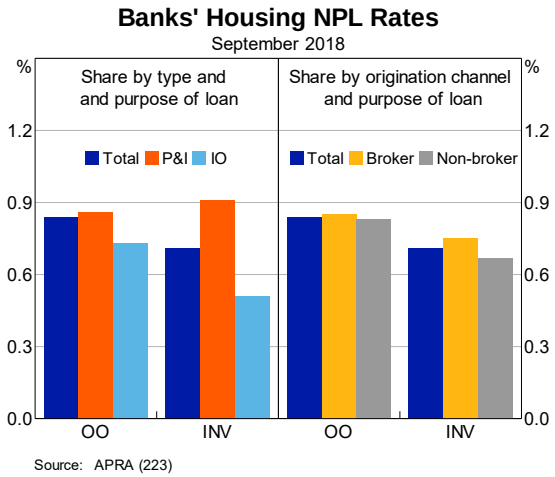
NPL ratios by LVR (%)
LVR for term loans outstanding
September Quarter 2018*

<60	60 to <80	80 to <85	85 to <90	90 to <95	>=95	>=80
0.5	0.6	1.2	1.2	1.8	6.1	1.6
(0)	(0)	-(1)	-(2)	(0)	(2)	-(2)

* Quarterly change in brackets (bps)

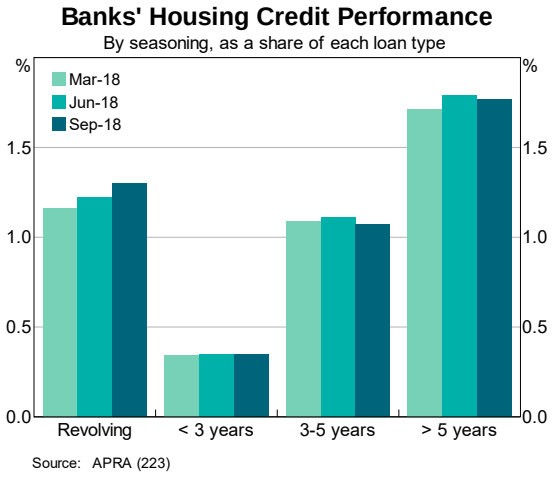
Sources: APRA (ARF 223)

G5 : As expected, IO loans tend to have lower NPL rates than P&I loans, in line with their lower servicibility costs. Housing loans originated via brokers have similar rates of non-performance to those originated through other channels.



Source: APRA (223)

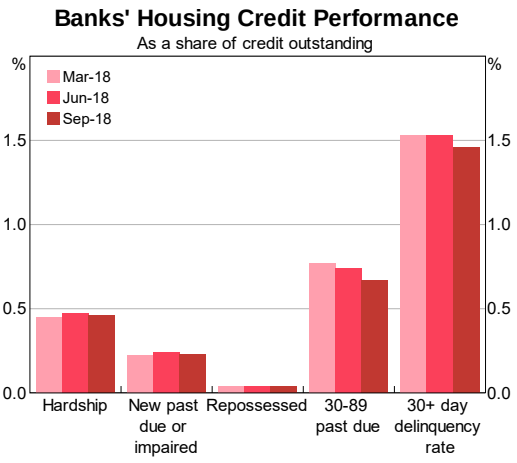
G6 : Non-performance remains highest for loans funded more than 5 years ago, followed by revolving credit facilities. These two groups of loans represent just under a quarter of total outstanding credit.



Source: APRA (223)

G7 : The 30+ day delinquency rate for the September quarter was 1.46 per cent, down 7 bps from the June quarter. This was mainly driven by a decrease in the share of housing loans that were 30-89 days past due. As a time series develops, these measures should provide more timely indications of changes in asset quality.

See Appendix B for more breakdowns by loan characteristics.



Source: APRA (223)

Zoya Dhillon
Households, Businesses and Credit
Financial Stability Department
13 December 2018

Appendix A

Banks' Non-performing Domestic Assets – ARF 220.0

Domestic books

	Share by loan type		Share of all loans		Amount		*Memo: loan type as share of all loans* [(a)]
	Per cent	Bps	Per cent	Bps	$b	$b	*Per cent*
	Sep-18	Qtrly chg	Sep-18	Qtrly chg	Sep-18	Jun-18	Sep-18
Housing	**0.87**	**0**	**0.53**	**-0.1**	**14.3**	**14.2**	***61***
Owner-occupier	0.90	-1	0.36	-0.3	9.8	9.8	*41*
Investor	0.81	2	0.17	0.2	4.5	4.4	*21*

(a) On-balance sheet credit as at September 2018

Sources: APRA; RBA

Appendix B

Banks' Non-Performing Housing Loans – ARF 223

September Quarter 2018*

	Non-performing loans	Qtrly change	Amount	Qtrly change	Loan type as a share of all loans
	(%)	bps	$b	$b	(%)
	Share by loan type				
Credit outstanding secured by residential property in Australia	0.81	0	14.1	0.1	**100.0**
Owner-occupier	0.84	-1	8.8	0.0	**60.6**
Interest-only	0.73	4	1.2	0.0	9.3
Principal & interest	0.86	-3	7.6	0.0	51.3
Broker-originated	0.85	-2	4.5	0.0	30.3
Investor	0.71	0	4.0	0.1	**32.6**
Interest-only	0.51	0	1.4	-0.1	16.0
Principal & interest	0.91	-1	2.6	0.1	16.6
Broker-originated	0.75	1	2.2	0.1	16.7

* Includes foreign subsidiaries and branches

Sources: APRA (ARF 223); RBA

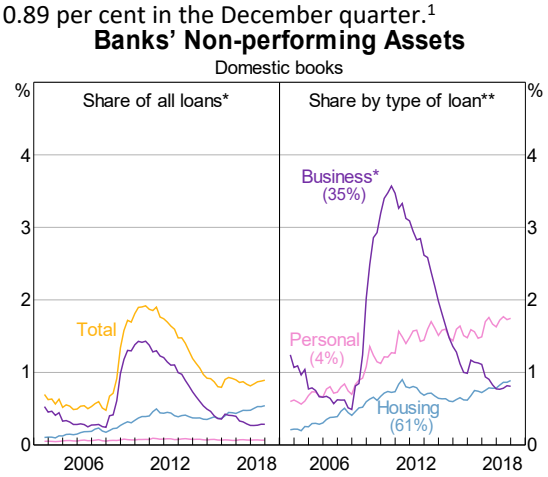
BANKS' NON-PERFORMING ASSETS – DECEMBER QUARTER 2018

Summary

- On a domestic-books basis, banks' total non-performing assets (NPA) rate edged higher in the December quarter to be 0.9 per cent. Over 2018, banks' total NPA rate increased by around 5 bps.
- The increase over the year was mainly driven by a deterioration in the performance of banks' housing loan portfolios. Much of this underperformance reflects housing loans in Western Australia. The share of non-performing housing loans in New South Wales has also been drifting higher, though it remains lower than the other states.

Banks' Non-Performing Domestic Assets

G1: Banks' total non-performing asset rate edged higher to 0.89 per cent in the December quarter.[1]

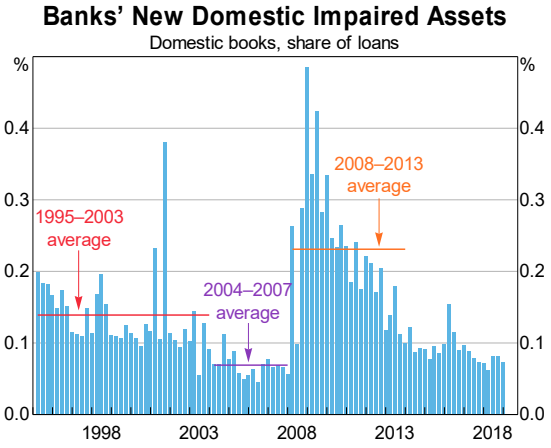


* Includes lending to financial businesses, bills, debt securities and other non-household loans

** Each category's share of total domestic lending at December 2018 is shown in parentheses

Sources: APRA; RBA

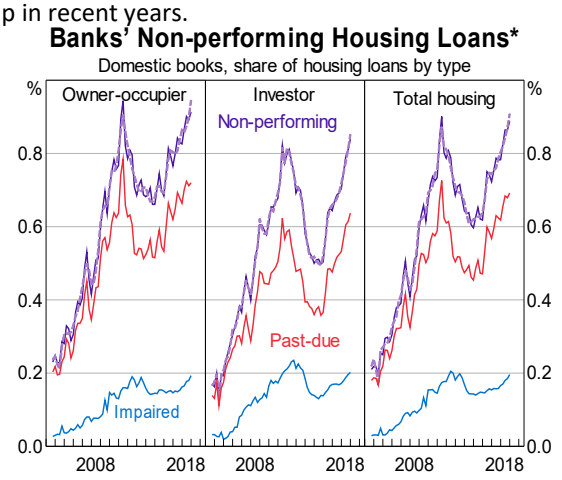
G2: The flow of new impaired assets as a share of outstanding assets declined in the December quarter.



Source: APRA

Banks' Non-performing Domestic Assets – Housing Loans

G3: The domestic housing NPL ratio increased in the December quarter; reflecting equal increases in loans held by INV and OO. Over 2018, the increase was larger for INV, particularly in loans that are past-due. The share of impaired housing loans has also been drifting up in recent years.



* Dashed lines are seasonally adjusted

Sources: APRA; RBA

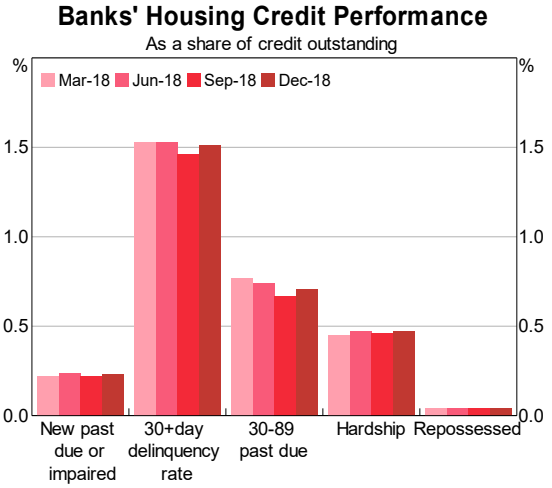
For detail at the aggregate level, see Appendix A.

1 The term "NPA rate" is used when the asset class includes non-loan items such as bills and debt securities issued by businesses. The term "NPL rate" is used when the asset class comprises just loans, which is typically the case for loans to households.

APRA's New Residential Mortgage Lending Form – Early Insights

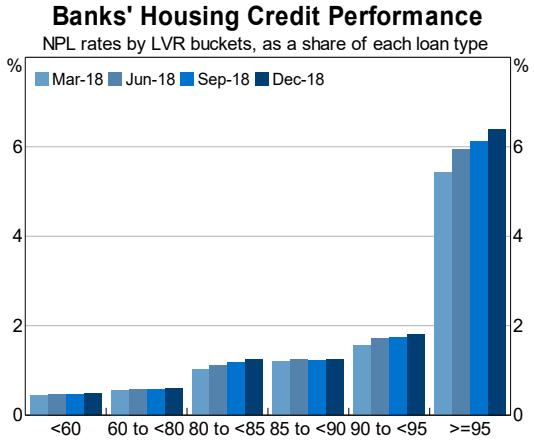
A new dataset on residential mortgage lending was collected by APRA for the first time in the March quarter 2018 (ARF 223). This includes new data breakdowns , including more granular data on non-performing housing loans. It is important to note however, that these new data are in their preliminary stage of reporting, with some smaller banks still reporting on a 'best endeavours' basis. As such, they are intended to complement the existing asset quality data from ARF 220.0 rather than replace it. Nevertheless, the data are consistent with our priors.

G5: The 30+ day delinquency rate for the December quarter was 1.5 per cent, up 6 bps from the September quarter. This was mainly driven by an increase in the share of housing loans that were 30-89 days past due. New past due or impaired loans were little changed in the quarter. As a time series develops, these measures should provide more timely indicators of changes in asset quality.



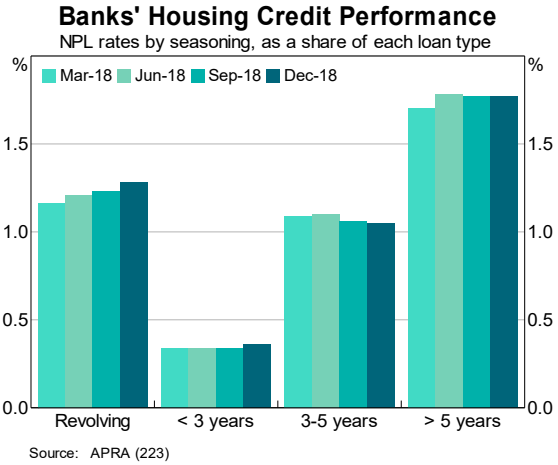
Source: APRA (223)

G6: NPL ratios tend to increase as the LVR increases.[2] NPL ratios have drifted up over the year across most LVR buckets. For NPL ratios for loans with LVR > 90, the **value** of loans that are non-performing has been steady or falling; the **value** of all loans with an LVR > 90 declined over 2018.



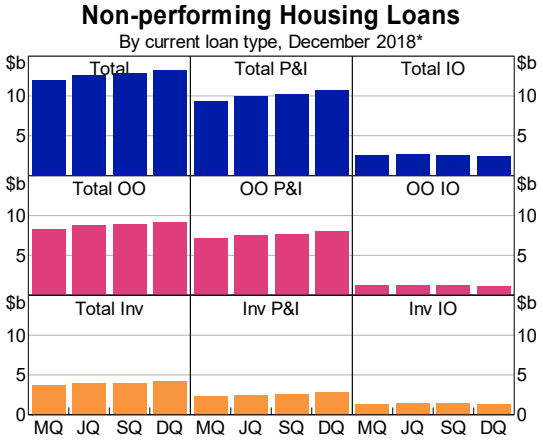
Source: APRA (223)

G7: Non-performance remains highest for loans originated more than 5 years ago, followed by revolving credit facilities. These two groups of loans represent just under a quarter of total outstanding credit.



Source: APRA (223)

G8: Increases in the **value** of P&I housing NPLs appear to be driving much of the increase in the aggregate **value** of housing NPLs. P&I loans are making up a greater share of the housing portfolio. The value of non-performing IO loans are fairly steady, despite the portfolio of IO loans shrinking. See Appendix B for more breakdowns by loan characteristics.



* These data record current loan type only. Loan type at origination may be different, particularly in the case of IO loans that have switched to P&I.

Source: APRA(223)

[2] Around 12 per cent of non-performing loans fall in the >=95 LVR category. This is likely to include the vast majority of impaired loans (i.e. loans that are not well secured).

Zoya Dhillon
Households, Businesses and Credit
Financial Stability Department
5 March 2019

Appendix A

Banks' Non-performing Domestic Assets – ARF 220.0

Domestic books

	Share by loan type		Share of all loans		Amount		*Memo: loan type as share of all loans* [(a)]
	Per cent	Bps	Per cent	Bps	$b	$b	*Per cent*
	Dec-18	Qtrly chg	Dec-18	Qtrly chg	Dec-18	Sep-18	Dec-18
Housing	**0.89**	**2**	**0.54**	**1.4**	**14.8**	**14.3**	***61***
Owner-occupier	0.91	2	0.37	0.9	10.1	9.8	*41*
Investor	0.84	3	0.17	0.4	4.7	4.5	*20*

(a) On-balance sheet credit as at December 2018

Sources: APRA; RBA

Appendix B

Banks' Non-Performing Housing Loans – ARF 223

December Quarter 2018*

	Non-performing loans	Qtrly change	Amount	Qtrly change	Loan type as a share of all loans
	(%)	bps	$b	$b	(%)
	Share by loan type				
Credit outstanding secured by residential property in Australia	0.83	2	14.4	0.4	**100.0**
Owner-occupier	0.85	1	9.0	0.3	**61.1**
Interest-only	0.75	2	1.1	-0.1	8.4
Principal & interest	0.86	1	7.9	0.3	52.7
Broker-originated	0.85	0	4.6	0.1	30.7
Investor	0.74	3	4.2	0.2	**32.3**
Interest-only	0.52	2	1.4	0.0	15.1
Principal & interest	0.93	2	2.8	0.2	17.2
Broker-originated	0.78	3	2.2	0.1	16.6

* Includes foreign subsidiaries and branches

Sources: APRA (ARF 223); RBA

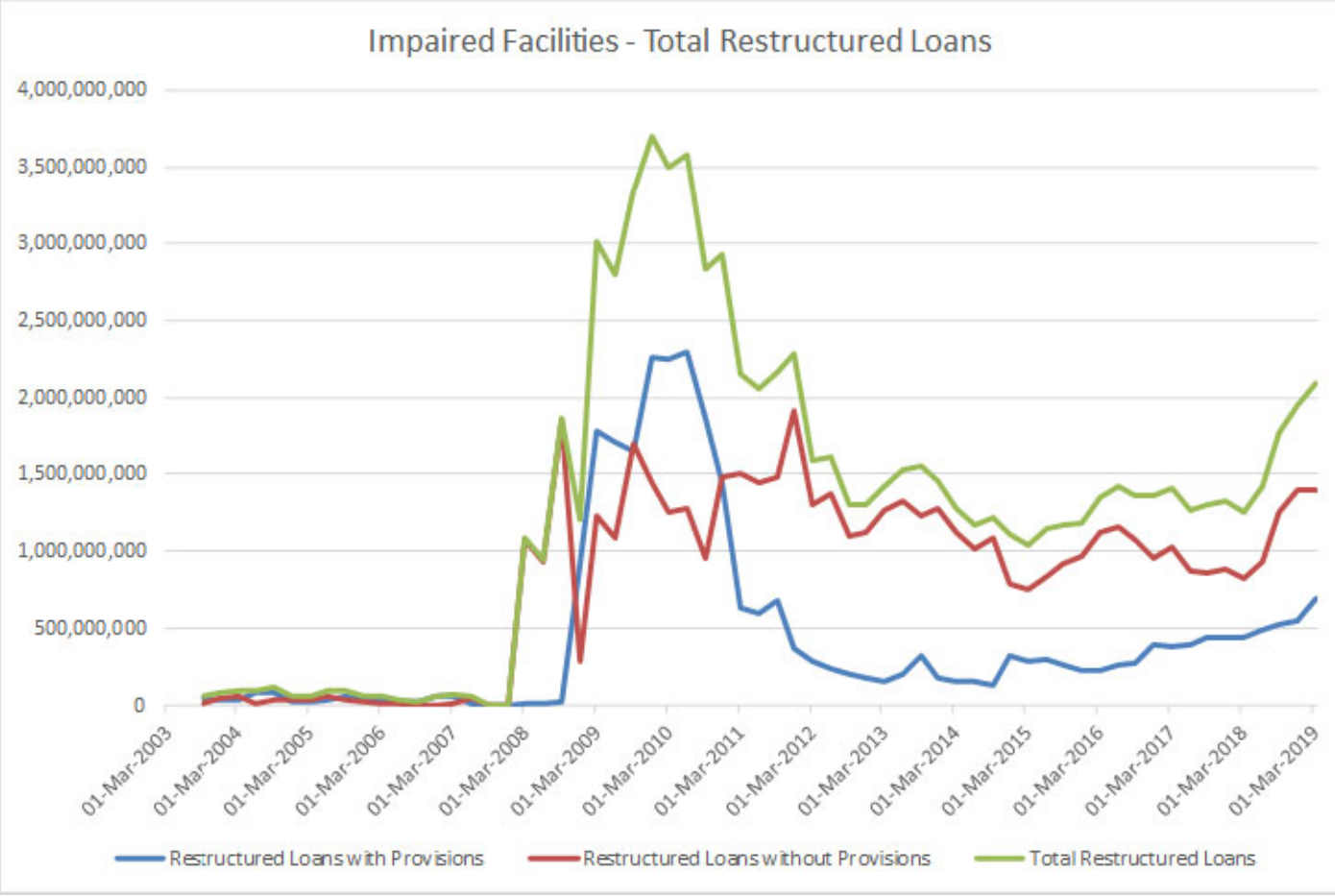
From: ARAUJO, Gabriela
Sent: Wednesday, 22 May 2019 11:20 AM
To: RYAN, Paul
Cc: FS - Households Businesses and Credit; SHANAHAN, Ben
Subject: RE: Loan flows into and out of arrears [SEC=UNCLASSIFIED]

I found this very helpful!

On the point about loan restructure, APRA data gives us some insight the amount of restructured loans (see graph below). Note that these series include all impaired loans that have been restructured. The amount of restructured loans increased sharply over 2018 driven by restructured loans where no provision for impairment has been raised in respect of it. This may reflect an increase in the inflow of impaired loans that are restructured (consistent with the message from liaison) or that it's taking longer for these loans to recover to non-impaired status or both. The loan needs to be fully performing under the restructured terms for at least six months or three payment cycles, whichever is greater, until it can be returned to non-impaired status.

In line with an increase in impaired housing loans, restructured loans with provisions have also been trending upwards since 2014. Restructured loans with provisions is designed to address instances where ADIs create a provision ahead of certain write-off.

Gabby



From: RYAN, Paul
Sent: Tuesday, 21 May 2019 5:44 PM
To: FS - Households Businesses and Credit ; SHANAHAN, Ben

Subject: FW: Loan flows into and out of arrears [SEC=UNCLASSIFIED]

Hi HBC – here's a briefing I wrote for Phil on flows into and out of arrears.

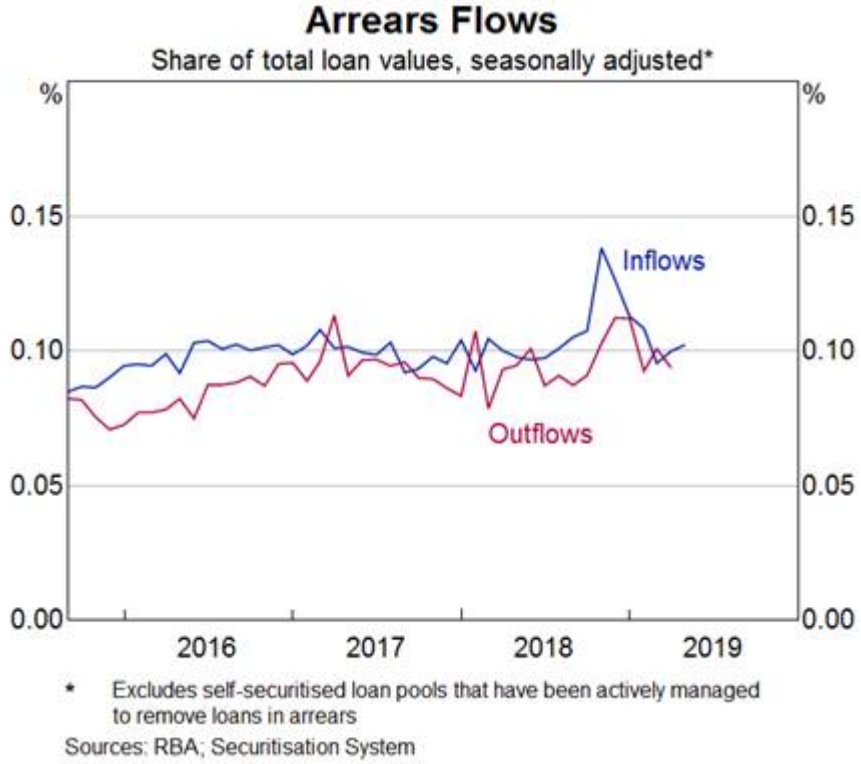
Any thoughts/ideas appreciated! This is going to be the basis of Jonathan's speech next month.

From: RYAN, Paul
Sent: Tuesday, 21 May 2019 5:40 PM
To: LOWE, Phil
Cc: BULLOCK, Michele ; KENT, Christopher ; KEARNS, Jonathan SMITH, Penny ; FS - HBC Management ; KOHLER, Marion CONNOLLY, Ellis ; DM - IMS Management

Subject: Loan flows into and out of arrears [SEC=UNCLASSIFIED]

Hi Phil,
I have been doing some work to understand the effect of the flows of loans into and out of 90+ day arrears using the Securitisation System. Much of this will be covered in a speech Jonathan is giving to the Property Council next month.

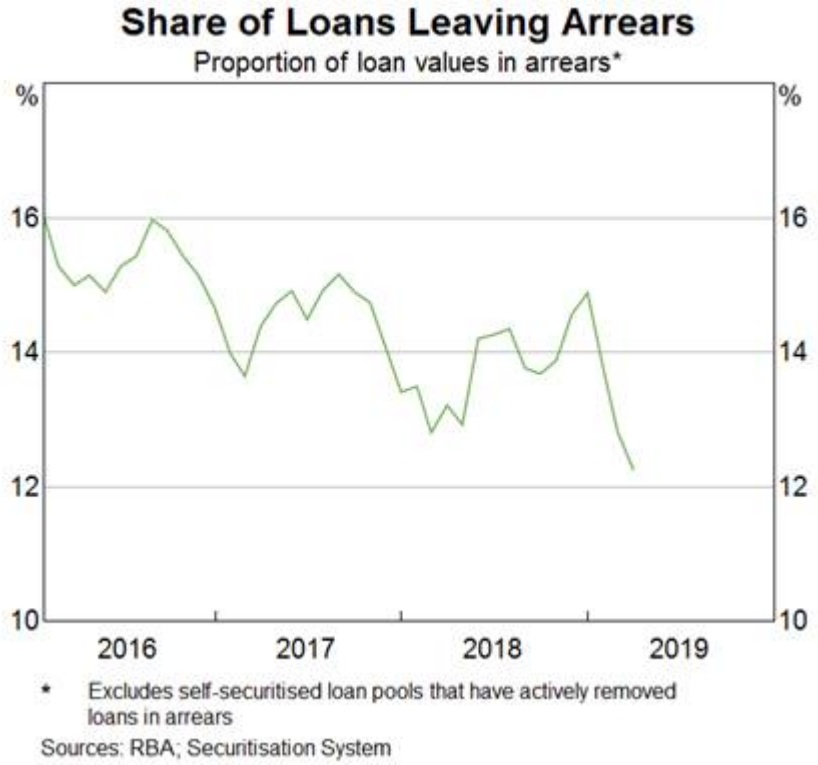
The rate of loans going into arrears, and loans leaving arrears, has remained broadly flat over the past few years:



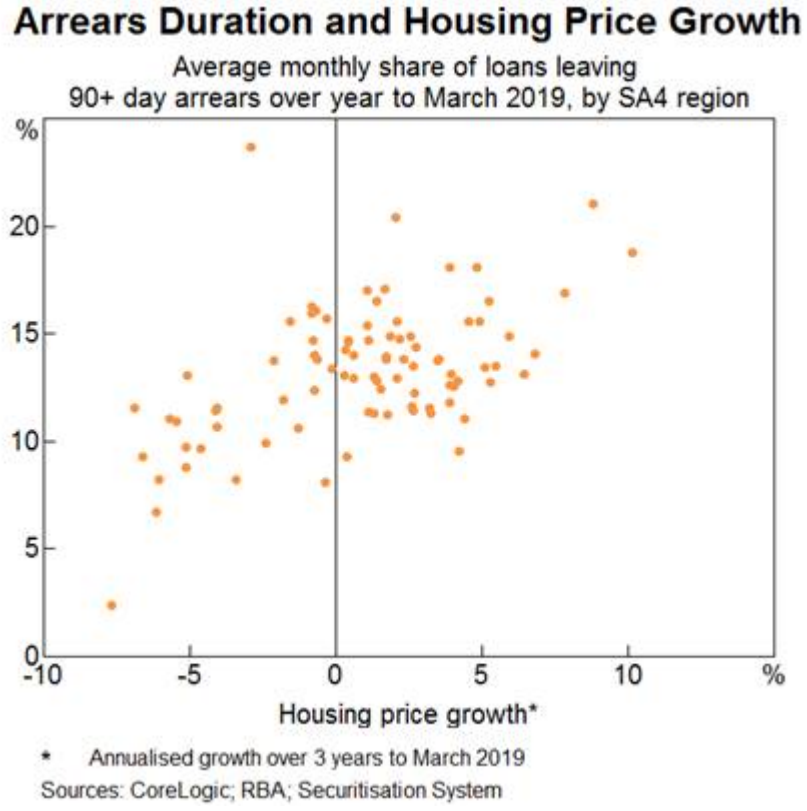
The arrears rate has risen due to the persistent level difference between inflows and outflows. Since these data do not cover earlier periods when the arrears rate was stable (and the two series were equal) it is difficult to determine which flow has changed to create this gap.

However, we have some evidence that outflow rates are lower than they would be if housing market conditions were more robust.

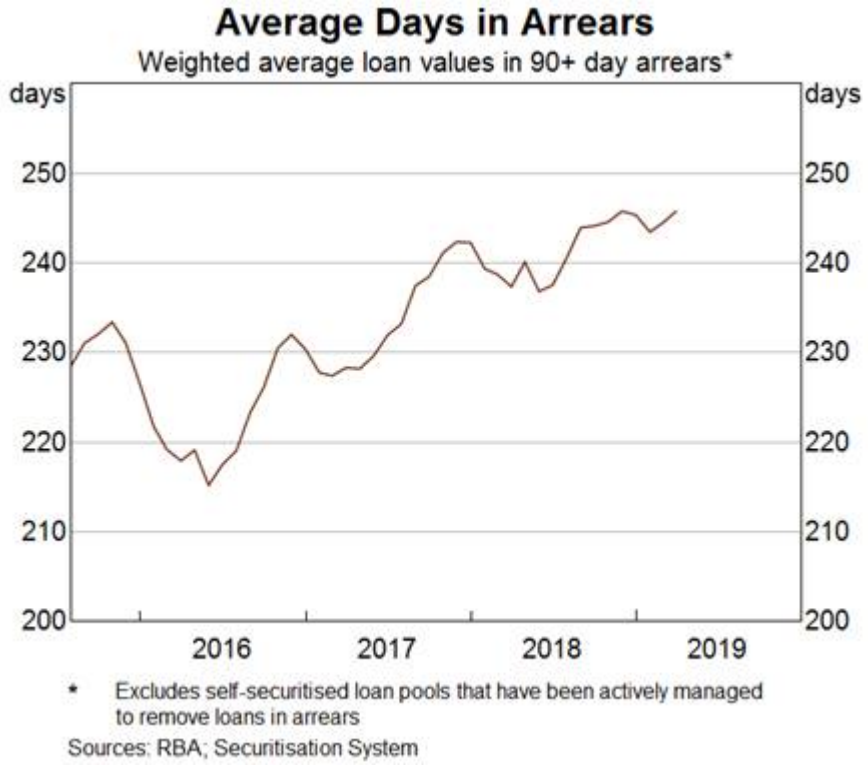
As the stock of loans in arrears has increased, constant outflow rates means that the unconditional probability of a loan leaving arrears has fallen:



This is consistent with the story from lenders, and our work on loans in negative equity, that subdued housing market conditions have made it harder to sell properties to resolve situations of arrears. In the cross-section, regions with weaker housing price growth have fewer loans leaving arrears:



This has led to loans being more deeply in arrears than in the past:



Lenders have also noted that reforms to allow more loan restructures and forbearance, in part in response to the Royal Commission, have allowed loans to stay in arrears for longer. We do have some visibility of these loans in the Securitisation System but again, the short time series makes assessing this effect difficult.

Although inflow rates have not increased over the period for which we have data, liaison with lenders has pointed to some reasons why more loans might be going into arrears than in the past:

- Borrower difficulty when switching from IO to P&I
- Higher serviceability requirements when refinancing

Our initial work has not found strong evidence for these explanations, but they may be contributing at the margin.

The changing composition of loans (aging of loans due to slower credit growth and seasoning of poorer quality cohorts), also cited by lenders, was explored in my earlier work and does not appear to have had a significant effect in aggregate: D18/361811

Please let me know if you have any other questions,
Paul

Paul Ryan | Senior Analyst | Financial Stability
RESERVE BANK OF AUSTRALIA | 65 Martin Place, Sydney NSW 2000
| w: www.rba.gov.au

HAS THE RISING ARREARS RATE BEEN CAUSED BY CHANGES IN LOAN COMPOSITION?

This note assesses the extent to which recent increases in housing loan arrears rates can be explained by changes in the composition of outstanding loans. It applies an age-period-cohort model to loans in the Securitisation dataset. The estimates suggest that the changing composition of loans, with respect to age and cohorts, does not explain much of the recent increase in arrears. There is, however, variation across states. In New South Wales, compositional effects are estimated to have accounted for around 15 per cent of the increase in arrears rates over the past year. In Western Australia, Queensland and South Australia, compositional effects have actually worked to reduce arrears rates. In summary, time-varying changes common to all loans, such as deteriorating macroeconomic or housing market conditions, have been driving the increase in arrears over recent years.

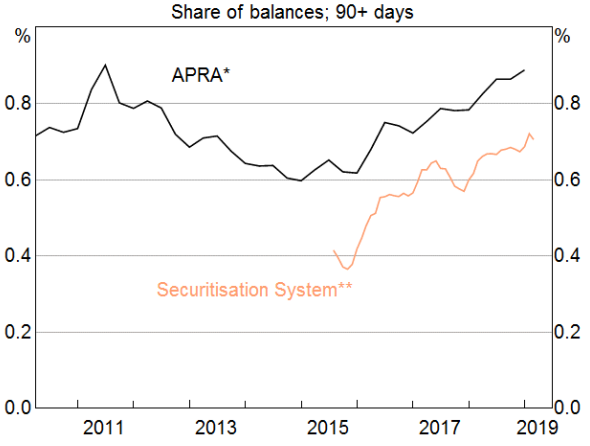
Introduction

Arrears rates are an important indicator of household financial stress and potential bank losses. Measures of aggregate mortgage loan arrears have been rising over recent years, according to data from both APRA and the Securitisation System (Graph 1). While coverage differences are important in explaining the *level* of these arrears rates – for example, APRA produces data on ADI lending, while the Securitisation System includes information on marketed non-ADI RMBS deals and self-securitised ADI loans – both have been trending upward since 2015.

Graph 1

Mortgage Loan Arrears

Share of balances; 90+ days

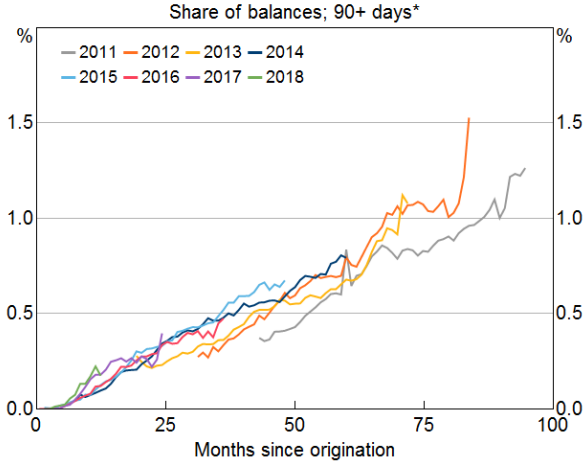


* Includes impaired loans that may not be 90+ days in arrears
** Excludes self-securitised loan pools that have been actively managed to remove loans in arrears
Sources: APRA; Securitisation System

Graph 2

Arrears Rates by Origination Year

Share of balances; 90+ days*



* Excludes self-securitised loan pools that have been actively managed to remove loans in arrears
Sources: RBA; Securitisation System

Both the APRA and Securitisation System measures are affected by changes in the composition of loans over time, for two key reasons. First, as loans age (or season), borrowers face a higher cumulative chance of shocks to employment or family circumstance, which may cause financial difficulty. This can be observed from the upward trend in arrears rates over time for loans of different cohorts – those originated in different calendar years (Graph 2).[1] This means the recent slowing in credit growth will have mechanically increased aggregate arrears rates as the average age of outstanding loans has increased. Second, loans originated at different times display different arrears rates (for a given loan age), which may reflect differences in lending standards or borrower expectations for housing prices, income growth or unemployment when they took out the loans. Changes in the share of loans of belonging to different cohorts can therefore also affect aggregate arrears rates. As a result, it is important to understand the effects of the changing age and cohort composition of loans in order to better isolate the extent to which

1 Sample selection issues affect the trend of arrears as loans age; borrowers in good financial position are able to refinance their loans and are removed from each cohort pool, which increases the share in arrears over time, while loans that default work in the opposite direction. Given the low level of defaults in Australia, the former effect has dominated and creates a seasoning profile that appears approximately linear for the first 10 years of seasoning.

the recent rise in arrears reflects 'underlying' changes in borrowers' ability to service their loans – for example due to changing macroeconomic or housing market conditions.[2]

Methodological approach

To separately isolate seasoning and cohort effects from common time effects on arrears, I use an age-period-cohort (APC) decomposition. This methodology is commonly used in epidemiology and demography, and has also been used for life-cycle decomposition of household consumption and saving (Finlay and Price 2014, Appendix A). This approach has not yet been used to analyse loan performance, although the potential has been noted (Bosman 2012; Forster and Sudjianto 2013). In this framework, the share of loans in arrears, α_{ap}, of age a, in period p, is decomposed into independent additive effects:

$$\alpha_{ap} = \beta_0 + \beta_a + \beta_p + \beta_c$$

Where β_0 is the intercept, and β_a, β_p and β_c are vectors of dummy variables for the age (seasoning), period (time) and cohort effects, respectively. However, APC analysis suffers from an identification problem: age, period and cohort are linearly dependent. That is, because by definition $cohort = age - period$, the effects are perfectly collinear and no unique OLS estimator exists.[3]

Since we have some theoretical basis for how cohort effects evolve, for this analysis I fix the cohort effects by year to break the linear dependence and identify the model.[4] This constraint is motivated by the theoretical persistence of the factors affecting cohort effects, such as changes to lending standards and household expectations, and is consistent with our current analysis of cohort effects on lending. The model as estimated as follows:

$$\alpha_{ap} = \sum_{a=1}^{a=280} \beta_{1a}.Age_a + \sum_{p=August\ 2015}^{p=December\ 2018} \beta_p.Period_p + \sum_{c=1995}^{c=2018} \beta_c.Cohort_c + \varepsilon$$

The data are extracted from the Securitisation System, with seasoning, origination date and report date combinations extracted for each available month. This is computationally tractable, since it reduces the full set of loan-level information down to roughly 110,000 summary arrears rates (with associated loan values). The limitations of excluding the full loan-level information are discussed below in *Conclusion, caveats and further work*.

I incorporate the intercept into the estimate of the first cohort effect: loans originated in 1995. The regression is weighted by the total balance of loans in each seasoning /origination date /report date cell, so the estimated effects aggregate to the balance-weighted arrears rates we track. Due to small sample sizes in the Securitisation System, I limit the analysis to borrowing cohorts starting in 1995 and loans up to 280 months old. Self-securitised pools that appear to be actively managed to remove loans in arrears are excluded from the analysis (de Roure 2019).

Aggregate Results

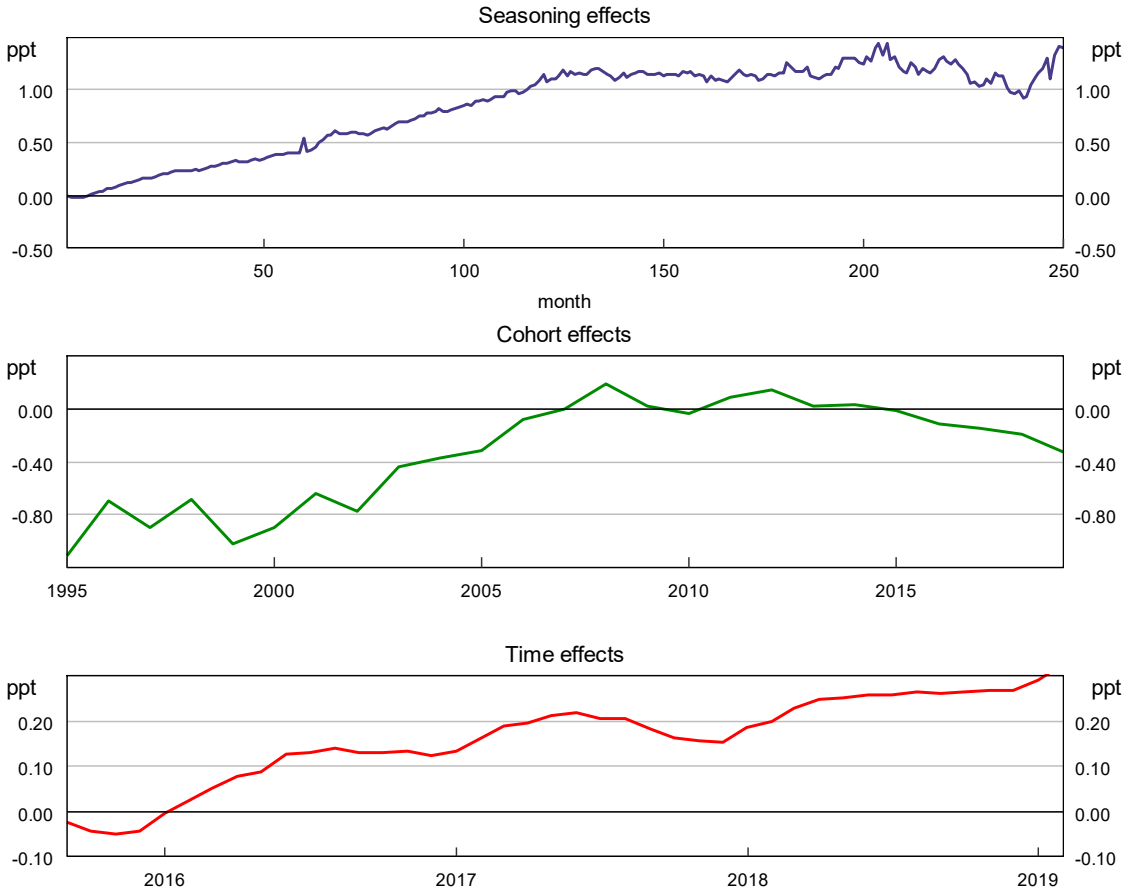
The results provide interesting insights into the separate effects of loan seasoning, cohorts and time effects on arrears (Graph 3). As loans season, the effect on arrears rates increases linearly, until they are around 10 years old. After this point, seasoning effects remain relatively stable. This profile is partly due to borrower selection, with those in better financial standing more likely to refinance their loans and drop out of the pool. The flattening of the seasoning profile may reflect a weakening of this selection effect, or amortisation balancing additional risk after this point, as amortisation is an increasing function of loan age.

2 Structural changes, such as policy changes relating to how banks treat loans in arrears will also remain.

3 A common and simple approach to address the identification problem is the use of linear constraints, but since the choice of constraint can affect the results and is often difficult to justify theoretically, a rich literature exists of solutions to the problem (Yang and Land 2013).

4 There is also some noise in how seasoning is reported in the Securitisation System, with some lenders reporting loans in their origination month having zero months of seasoning (as is asked for in the reporting guidance), with others reporting one month. The exclusion of this noise does not significantly change the results.

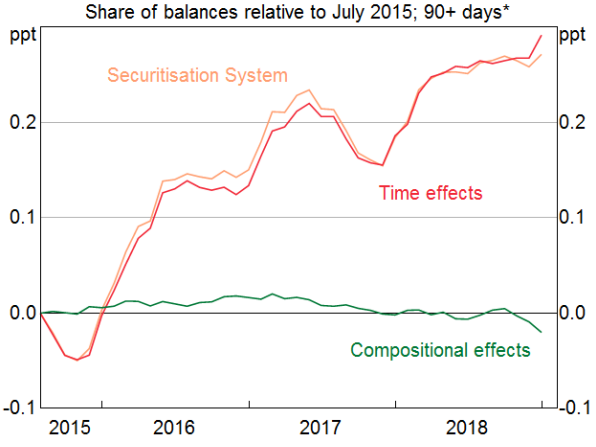
Graph 3
Age Period Cohort Decomposition of Arrears Rates
Coefficient average effects; 90+ days



Source: Author's calculations; Securitisation System

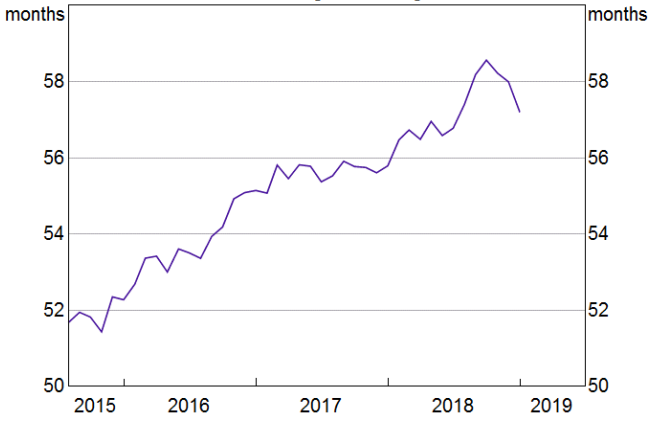
The cohort effects suggest loans written throughout the late 2000s were progressively more susceptible to going into arrears. After the GFC, the quality of cohorts appears to have improved, particularly after 2014. This is consistent with evidence that the suite of housing lending policy changes introduced over recent years has reduced the riskiness of new lending (RBA *Financial Stability Review* October 2018).

Graph 4
Arrears Rates
Share of balances relative to July 2015; 90+ days*



* Excludes self-securitised loan pools that have been actively managed to remove loans in arrears
Sources: Author's calculations; Securitisation System

Graph 5
Securitised Mortgage Seasoning
Balance-weighted average*



* Excludes self-securitised loan pools that have been actively managed to remove loans in arrears
Source: Securitisation System

The time effects indicate that, after removing the effects of the composition of loan ages and cohorts, mortgages have been increasingly more likely to be in arrears since late 2015. Indeed, comparing these estimated time effects with the change in the aggregate arrears rate from the Securitisation System

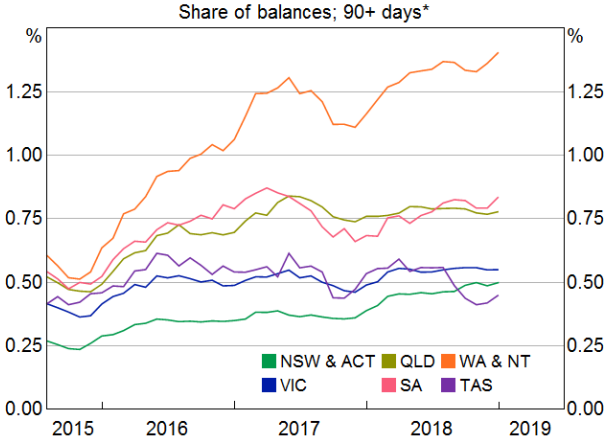
suggests that compositional effects have had little net effect (Graph 4). This is surprising given the average seasoning of loans in the Securitisation System has been increasing (Graph 5), but suggests that improving cohort effects of newer loans (for example due to improved lending standards) have offset the effect of loan seasoning.

State results

Arrears rates display significant regional variation (Graph 6), and the Securitisation data allow separate, state-based decompositions of the effects of compositional change. While age effects are likely to be common across states, cohort effects will differ if average lending standards or borrower expectations for income growth and employment vary by state. Similarly, time effects will differ to the extent that economic conditions vary across states.

I estimate a second model adding state and territory fixed-effect interactions with both the cohort and time effects. Seasoning effects remain commonly estimated across regions, since their drivers are unlikely to show regional differences.

Graph 6
Mortgage Arrears Rates by State
Share of balances; 90+ days*



* Excludes self-securitised loan pools that have been actively managed to remove loans in arrears

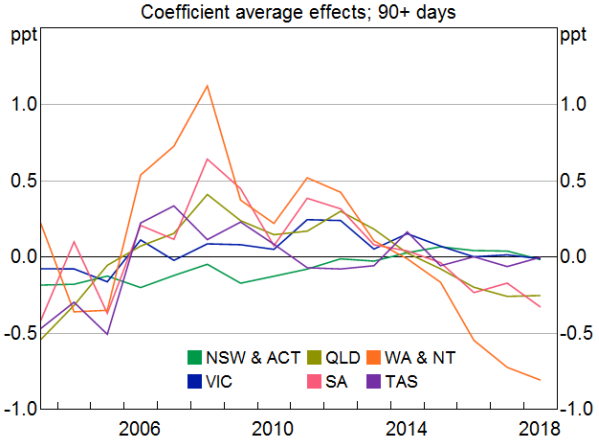
Source: Securitisation System

The model becomes:

$$\alpha_{ap} = \sum_{a=1}^{a=280} \beta_{1a}.Age_a + \sum_{p=August\ 2015}^{p=December\ 2018} \sum_{s=1}^{s=6} \beta_{ps}.Period_p.State_s + \sum_{c=1995}^{c=2018} \sum_{s=1}^{s=6} \beta_{cs}.Cohort_c.State_s + \varepsilon$$

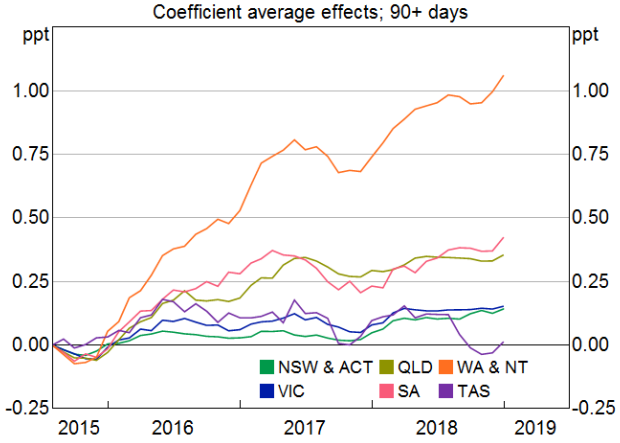
Where s are fixed effects for each state.[5] Limited sample sizes leave the estimates of state-level cohort effects volatile prior to the mid-2000s, but afterwards the cohort effect on arrears in WA, NT, South Australia and Queensland increased for loans written before and just after the global financial crisis (Graph 7). This reflects that these loans have performed more poorly, on average, than other loans and may be due to unrealised housing price or income expectations, and/or looser lending standards in these states during this period. By contrast, since 2014 loans written in these regions have performed relatively well, particularly those in WA and NT. These results suggest that all of the improvement in cohort effects seen in the aggregate analysis in Graph 3 have been driven by these mining-exposed regions.

Graph 7
Cohort Effects on Arrears by State
Coefficient average effects; 90+ days



Sources: Author's calculations; Securitisation System

Graph 8
Common Time Effects on Arrears by State
Coefficient average effects; 90+ days



Sources: Author's calculations; Securitisation System

5 The ACT and NSW as well as the NT and WA are considered jointly, due to both low sample sizes in the territories and strong economic connections to their neighbour states.

Consistent with trends in aggregate arrears rates, the estimates of common time effects have increased over recent years, particularly in WA and the NT (Graph 8). More recently, however, there has also been an increase in the common time effects in states with stronger underlying economic conditions, including NSW and Victoria. This may reflect a deterioration in housing market conditions, which can make resolving loans in arrears more difficult.

As before, comparing these time effects with aggregate arrears rates allows us to isolate – and therefore abstract from – the effects of compositional change. In mining-affected states, compositional effects, specifically improving cohort effects, have been reducing aggregate arrears rates (Table 1). In WA and the NT, this effect has amounted to around 8 basis points over the past year. By contrast, in NSW and the ACT, compositional effects, specifically, the aging of the loan pool, increased aggregate arrears rates by around 2 basis points. However, the majority of the increase in the NSW and ACT arrears rate can be still be attributed to time effects.

Table 1: Decomposition of Arrears Rates

Year to December 2018

	Contribution to National Change	Weight	Change in State Arrears Rate	*Of which, due to*	
				Time	*Composition*
	%	*%*	*bps*	*bps*	*bps*
NSW & ACT	40	35	11	9	2
VIC	18	25	6	7	-1
QLD	7	21	2	6	-4
SA	8	6	15	19	-4
WA & NT	27	11	24	32	-8
TAS	0	1	-8	-8	0

Sources: Author's calculations; Securitisation System

Conclusion, caveats and future work

Compositional effects are not responsible for much of the increase in arrears rates over recent years. In fact, in states affected by the mining investment boom, compositional effects have dampened the recent increase in arrears. Factors common to loans of different ages and cohorts are most important in explaining the increase in arrears – pointing to deterioration of economic or housing market conditions being the primary driver.

Some caveats are appropriate. First, the sample covers loans in the Securitisation System, which may not be representative of all mortgages. While the Securitisation System covers around 20 per cent of housing loans by value, most are self-securitised, which tend to be younger, of higher credit quality, with fewer high-LVR, investor and interest-only loans (Bergmann 2018). This suggests that the effect of compositional change on overall arrears rates may differ from these results. However, the time effects will only differ if securitised loans are more or less resilient to changing macroeconomic conditions, which does not appear to be the case (Graph 4).

Methodological concerns remain. The APC model assumes additive age, cohort and time effects, which may be unrealistic. The model will only be able to identify average effects, and can not tell us if certain cohorts of loans have different seasoning patterns, or are affected differentially by macroeconomic shocks.

Work is underway to undertake similar analysis with the loan-level data. This will enable more compositional changes in the stock of loans to be controlled for, such as the changing share of investor and interest-only loans, which tend to have unconditionally lower arrears rates. In addition, such analysis may be able to model more sophisticated interactions between cohort, age and time effects. The challenge for this work is it is computationally difficult: not all of the loan-level data available in the Securitisation System can be analysed at one time.

Replication files: D19/84900

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26 March 2019

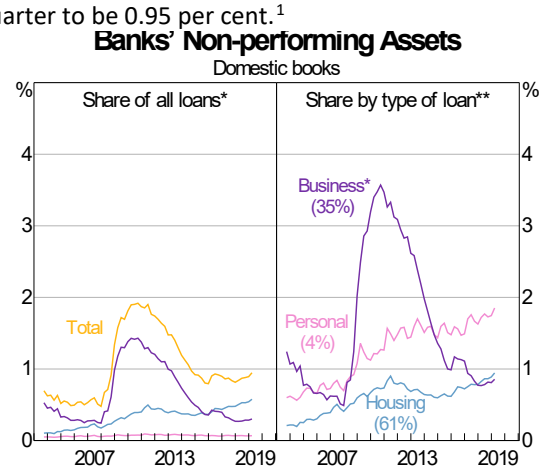
BANKS' NON-PERFORMING ASSETS – MARCH QUARTER 2019

Summary

- The housing non-performing loans (NPL) ratio increased again in the quarter, driven by the deterioration in the performance of banks' housing loan portfolios in eastern Australia; the aggregate housing NPL ratio now exceeds its GFC peak.

Banks' Non-Performing Domestic Assets

G1: Banks' total NPA rate increased further in the March quarter to be 0.95 per cent.[1]

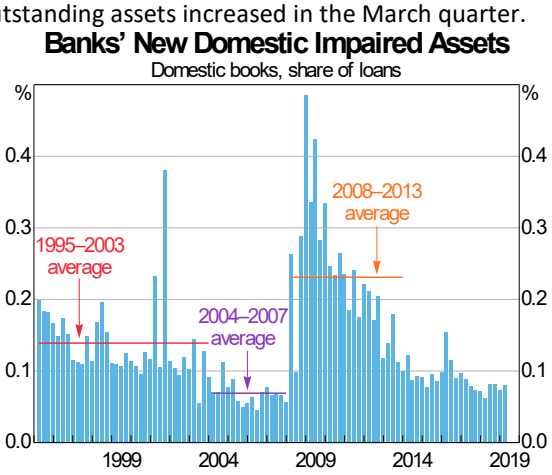


* Includes lending to financial businesses, bills, debt securities and other non-household loans

** Each category's share of total domestic lending at December 2018 is shown in parentheses

Sources: APRA; RBA

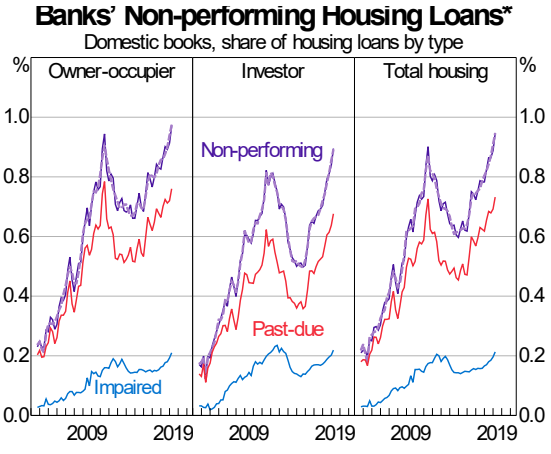
G2: The flow of new impaired assets as a share of outstanding assets increased in the March quarter.



Source: APRA

Banks' Non-performing Domestic Assets – Housing

G3: The domestic housing NPL ratio increased further in the March quarter, reflecting equal increases in loans held by investors and owner-occupiers. Both the share of past-due housing loans and impaired housing loans rose in the quarter.



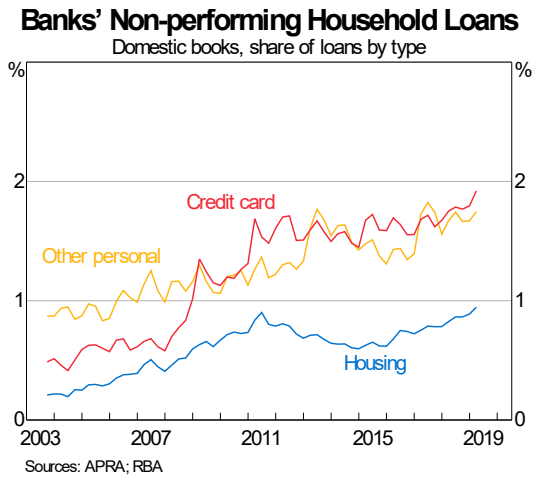
* Dashed lines are seasonally adjusted

Sources: APRA; RBA

1 The term "NPA rate" is used when the asset class includes non-loan items such as bills and debt securities issued by businesses. The term "NPL rate" is used when the asset class comprises just loans, which is typically the case for loans to households.

G5-8: Major banks' 1H19 results suggest that 90+ days mortgage arrears rates in WA have risen across all banks.[2] Arrears in NSW have also increased but remain low in absolute terms.

G9: The NPL rate for personal loans increased in the quarter, reflecting higher NPL ratios for other personal and credit card loans.



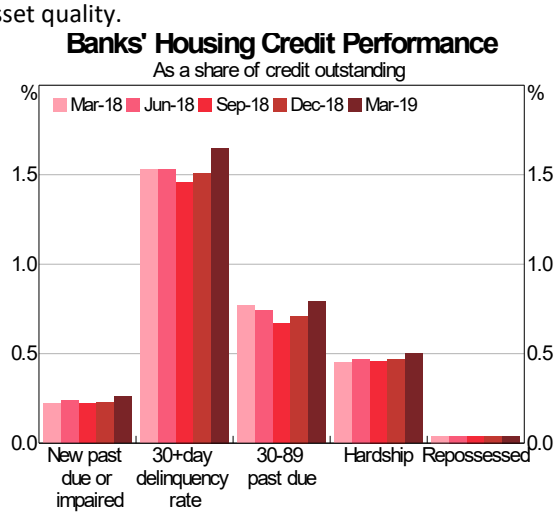
For detail at the aggregate level, see Appendix A.

2 See ANZ – Half Year Results 2019, CBA – Half Year Results 2019, NAB – Half Year Results 2019 and WBC – Half Year Results 2019

APRA's New Residential Mortgage Lending Form – Early Insights

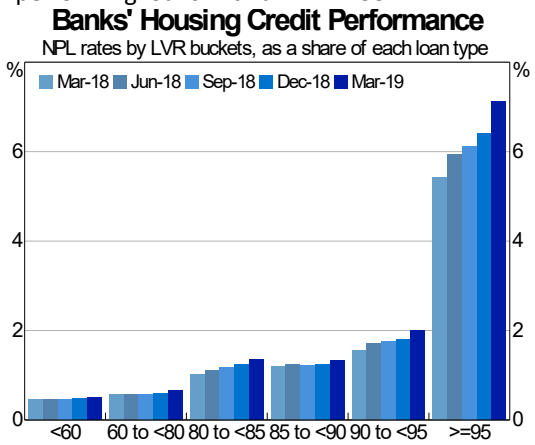
A new dataset on residential mortgage lending was collected by APRA for the first time in the March quarter 2018 (ARF 223.0). This includes new data breakdowns including more granular data on non-performing housing loans. However, it is important to note that these new data are in their preliminary stage of reporting, with some smaller banks still reporting on a 'best endeavours' basis. As such, they are intended to complement the existing asset quality data from ARF 220.0 rather than replace it. They also report all loans secured by residential property, not just owner-occupier and investor loans. Nevertheless, the data are consistent with our priors.

G10: The 30+ day delinquency rate increased by 14 bps in the March quarter, largely driven by an increase in the share of housing loans 30-89 days past due. New past due or impaired loans increased a little in the quarter. As a time series develops, these measures should provide more timely indicators of changes in asset quality.



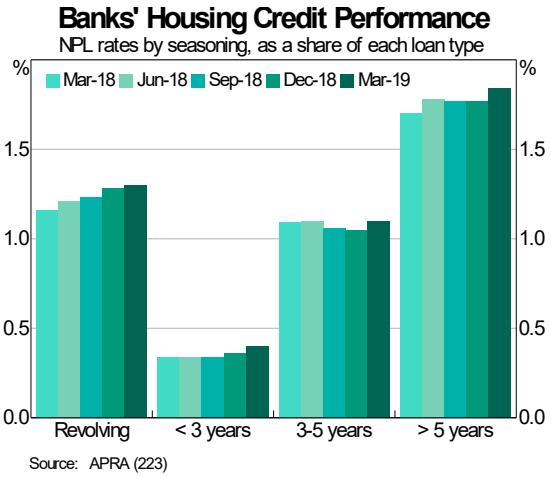
Source: APRA (223)

G11: NPL ratios tend to increase as the LVR increases.[3] NPL ratios rose across all LVR buckets in the quarter. The NPL ratio for loans with an LVR ≥ 95 increased by around 73 bps, reflecting both a decline in the **value** of loans with an LVR > 95 and an increase in the **value** of non-performing loans with an LVR > 95.



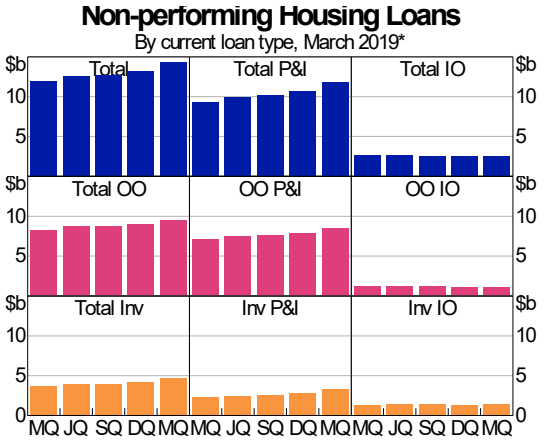
Source: APRA (223)

G12: Non-performance remains highest for loans originated more than 5 years ago, followed by revolving credit facilities. These two groups of loans represent just under a quarter of total outstanding credit; the NPL ratios for both groups increased in the quarter.



Source: APRA (223)

G13: Growth in the **value** of P&I housing NPLs look to be driving most of the increase in the aggregate **value** of housing NPLs. P&I loans are making up an increasing share of the housing portfolio. The value of non-performing IO loans remains steady. See Appendix B for more breakdowns by loan characteristics.



* These data record current loan type only. Loan type at origination may be different, particularly in the case of IO loans that have switched to P&I.

Source: APRA(223)

3 Around 12 per cent of non-performing loans fall in the >=95 LVR category. This is likely to include the vast majority of impaired loans (i.e. loans that are not well secured).

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3 June 2019

Appendix A

Banks' Non-performing Domestic Assets – ARF 220.0

Domestic books

	Share by loan type		Share of all loans		Amount		*Memo: loan type as share of all loans* [(a)]
	Per cent	Bps	Per cent	Bps	$b	$b	*Per cent*
	Mar-19	Qtrly chg	Mar-19	Qtrly chg	Mar-19	Dec-18	Mar-19
Housing	**0.94**	**6**	**0.58**	**3.5**	**15.9**	**14.8**	***61***
Owner-occupier	0.97	6	0.40	2.5	10.9	10.1	*41*
Investor	0.89	6	0.18	1.0	5.0	4.7	*20*

(a) On-balance sheet credit as at March 2019

Sources: APRA; RBA

Appendix B

Banks' Non-Performing Housing Loans – ARF 223

March Quarter 2019*

	Non-performing loans	Qtrly change	Amount	Qtrly change	Loan type as a share of all loans
	(%)	bps	$b	$b	(%)
	Share by loan type				
Credit outstanding secured by residential property in Australia	0.88	6	15.5	1.1	**100.0**
Owner-occupier	0.90	5	9.5	0.5	**60.8**
Interest-only	0.82	6	1.1	0.0	7.6
Principal & interest	0.91	5	8.5	0.6	53.2
Broker-originated	0.92	6	4.9	0.3	30.7
Investor	0.82	8	4.7	0.6	**33.1**
Interest-only	0.55	3	1.4	0.0	14.6
Principal & interest	1.03	10	3.3	0.5	18.5
Broker-originated	0.86	8	2.5	0.3	16.9

* Includes foreign subsidiaries and branches

Sources: APRA (ARF 223); RBA