



# Bulletin

*Vol. 82, No. 6*

*May 2019*



## Reserve Bank of New Zealand *Bulletin*

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ISSN 1177-8644

# Review of the Reserve Bank's loan-to-value ratio policy

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## Non-technical summary

A loan-to-value ratio (LVR) is a measure of how much a bank lends to a borrower, relative to the value of the borrower's property secured against the lending. The more the banking system as a whole lends to high-LVR borrowers the greater the risk that the banking system will suffer large losses in a severe downturn. If banks do suffer large losses they may become unwilling to continue lending to the wider economy. Experience in other countries suggests this can have a damaging and lasting effect on the economy.

The Reserve Bank of New Zealand (RBNZ) introduced LVR restrictions in October 2013 in response to financial stability risks associated with a potential house price correction and high-LVR mortgage lending, and has adjusted policy settings in response to changing risks. The LVR policy is aimed at constraining excessive house price inflation and household credit growth to lean against the risks of a severe correction. In doing so, it can support both financial system stability and sustainable economic growth.

The Reserve Bank had considered, but decided against, capital macroprudential tools instead of the LVRs, although baseline capital rules for high-LVR loans were tightened. The LVR restrictions tend to have a greater impact in directly reducing housing and household sector risks, and in mitigating the scale of an economic downturn, than capital-based macroprudential tools that are focused on building additional bank capital buffers for absorbing shocks. This review traces changes in the LVR policy over the past five years, analyses the effect they have had on banks and households, and asks what the Reserve Bank can learn from this experience.

The review suggests that the LVR policy has been effective in improving financial stability. By mitigating the scale of house price falls during a potential downturn, and limiting the indebtedness of households, the policy has made the financial system more resilient to a housing-led downturn. Declining risk weights for housing loans have offset some of the resilience benefit of LVRs, although the Reserve Bank has adjusted baseline housing capital calibrations to stabilise risk weights and support bank resilience since 2013. The LVR policy has also mitigated the likely decline in household spending and economic activity during a stress scenario.

All prudential tools have an efficiency cost, which must be weighed against the benefits. The LVR policy is likely to have had a larger

impact in constraining mortgage borrowing capacity than alternative macroprudential tools. This suggests that the LVR policy should be deployed primarily when housing and household sector risks are high, to maximise the benefits of the policy relative to the efficiency costs, which are reduced credit access for credit-worthy borrowers and the potential for slower economic growth in the short-term. The speed limit of high-LVR loans is an important calibration tool to mitigate the efficiency cost of the policy

The review also assessed the potential tension between the LVR policy and other social objectives, and other unintended effects of the policy:

- The initial LVR calibration disproportionately restricted purchases by first home buyers (FHBs), creating a tension with the public policy goal of housing affordability. Over time, the policy has increasingly operated by restricting property investor purchases, and rebalanced the policy burden away from FHBs.
- The Auckland regional LVR policy (applied for about a year starting in late 2015) contributed to a spillover of housing demand from Auckland to other regions, despite being effective at addressing risks in Auckland itself.
- Although the provision of mortgages by non-banks has grown since the policy came into place, the scale of this disintermediation remains too small to significantly erode the effectiveness of the LVR restrictions. This suggests that the LVR policy will remain effective in improving bank resilience for a longer period than originally expected.
- The policy could impact on competition, the construction of new housing, and rents. If these effects have been present, they have not been of a sufficient scale to be identified.

There are limits to what the LVR policy can achieve. The LVR tool is relatively ineffective at influencing aggregate demand and inflationary pressures, and therefore should not be used as a lever of monetary policy. More importantly, the pressures on the housing market and the rental market from a growing population, a limited supply of housing, and low mortgage rates require a range of responses that are outside the scope of prudential policy.

## 1 Introduction

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The Reserve Bank's prudential policy aims to promote and maintain the soundness and efficiency of the financial system. As a subset of prudential policy, time-varying macroprudential policy focuses on systemic risks arising from the pro-cyclicality of the financial cycle, and the self-reinforcing interaction between credit and asset prices during boom-bust cycles.<sup>1</sup> The tools of time-varying macroprudential policy are set out in the 2013 Memorandum of Understanding (MoU) between the Minister of Finance and the Governor of the Reserve Bank. The MoU included a commitment to review the macroprudential policy framework after five years.

Macroprudential instruments can be categorised into two groups: bank-based tools that build capital and liquidity buffers on the balance sheets of financial institutions, and transactional instruments that are focused on household balance sheets. The bank-based instruments available to the

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<sup>1</sup> The definition and purpose of macroprudential policy vary to some extent across jurisdictions (NZ Treasury, 2018). The term 'macroprudential' has been mainly used to refer to time-varying policies in the New Zealand context, and that's how it is used in this review from this point forward. Internationally the term is taken to include a broader set of prudential interventions, as long as they are focused on the financial system as a whole.

Reserve Bank are the countercyclical capital buffer (CCyB), the sectoral capital requirement (SCR), and the core funding ratio. In contrast, the LVR restriction is a transactional instrument.

This paper summarises the Reserve Bank's experience in conducting the LVR restrictions policy, and draws out the key implications for policy. Section 2 describes the history of the LVR policy and outlines the policy problem defined at the time of intervention. Section 3 assesses the effectiveness of the LVR policy in promoting financial system soundness and sustainable economic growth. Section 4 examines other impacts of the LVR policy, including distortionary effects on financial system efficiency and tensions with other public policy objectives.

## 2 LVR interventions and problem definition

The Reserve Bank introduced the LVR restrictions in October 2013. The policy requires registered banks to restrict their lending to borrowers with a high loan-to-value ratio, as defined by the policy, to below a specified proportion of their new lending (the speed limit).<sup>2</sup> Table 1 summarises the adjustments in the LVR restrictions since 2013. We focus on three major phases of intervention:

2 The loan-to-value ratio (LVR) of a loan is the ratio of the borrowed loan amount to the value of the collateral underpinning the mortgage, often expressed in percentage terms. The speed limit is the maximum percentage of new mortgages loans that can be approved by a bank above a specified LVR (the LVR policy threshold).

1. Introduction of LVRs (2012-13): The policy stipulated that no more than 10 percent of the value of all new residential mortgage loans approved by a bank may exceed an LVR of 80 percent (except for mortgages exempt from policy).
2. Tighter limits for investor loans (2015-16): The policy was progressively tightened to a 5 percent speed limit for investment properties with an LVR exceeding 60. The policy had different settings between Auckland and non-Auckland borrowers between 2015 and 2016.<sup>3</sup>
3. Easing of the policy (2018): The Reserve Bank has gradually eased the LVR restrictions, first in January 2018, and again in January 2019.

### *Introduction of LVR policy (2013-14)*

The LVR policy was developed at a time of strong house price appreciation and relatively easy lending standards. The Reserve Bank was concerned about the potential for a severe correction in house prices to present significant loan losses for banks. Around this time, a growing body of international evidence supported the conclusion that house price and credit booms are associated with a larger probability and magnitude of house price downturns.<sup>4</sup> As a secondary concern at the time of the first intervention, the Reserve Bank was aware of the potential for high

3 The 2015 changes also involved an easing of the speed limit for all mortgage lending outside of Auckland (RBNZ, 2015). In October 2016, the Reserve Bank removed the Auckland distinction in the LVR policy and tightened the restrictions for property investors nationwide

4 Thornley (2016) provides a summary of how housing lending can amplify economic downturns. Jorda *et al.* (2015) analysed data on 17 countries from 1870 and found that, when fuelled by credit growth, house price bubbles increase the risk of a financial crisis and are followed by a deeper recession. Jorda *et al.* (2013) found that stronger credit growth in the expansionary phase of an economic cycle tend to be followed by a deeper recession. Bridges *et al.* (2017) studied 130 downturns in advanced economies since the 1970s, and found that strong credit growth leading up to a recession predicts a deeper and longer recession.

**Table 1**  
**Loan-to-value ratio restriction changes, 2013 to 2019**

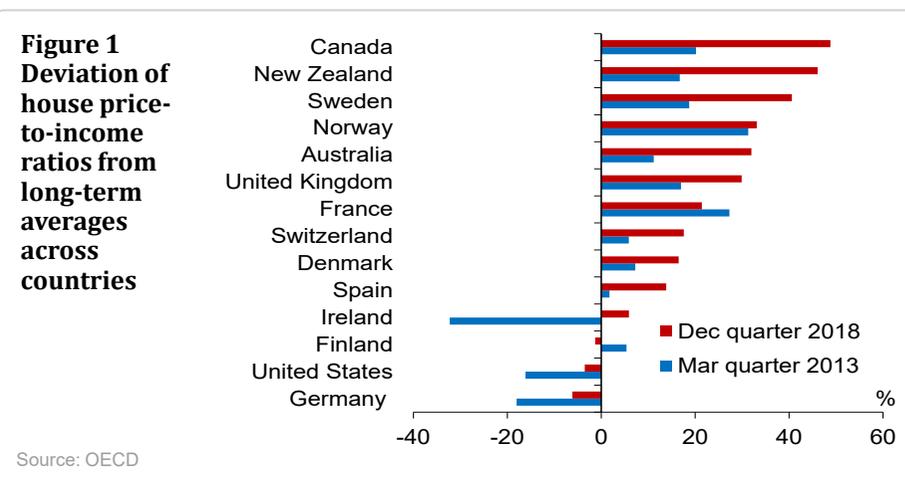
		All non-AKL	Owner occupier	AKL owner occupier	Investor	AKL investor
<b>2013 October</b>	Speed limit		10		10	
	Threshold		80		80	
<b>2015 November</b>	Speed limit	15		10		5
	Threshold	80		80		70
<b>2016 October</b>	Speed limit		10		5	
	Threshold		80		60	
<b>2018 January</b>	Speed limit		15		5	
	Threshold		80		65	
<b>2019 January</b>	Speed limit		20		5	
	Threshold		80		70	

red = tightening, yellow = steady, green = easing.

and rising levels of household indebtedness, when driven by inadequate origination standards, to amplify a future economic downturn (RBNZ, 2013).

By late 2013, the average New Zealand house price-to-income ratio was elevated by international standards (figure 1). While house price inflation partly reflected economic factors, including low interest rates, high immigration and sluggish housing supply, the level of prices also appeared to be supported by optimistic expectations of capital gains and unsustainable growth in household credit. As such, the market was at risk of a major correction given a negative economic shock. The risk was most pronounced in Auckland, where house prices were growing quickly from a high level.

The period prior to the introduction of LVRs was also marked by increasing concentrations of low-deposit lending. New mortgage lending



**Figure 2**  
**High-LVR**  
**residential**  
**mortgage**  
**lending**  
*(% of new*  
*lending)*



Sources: RBNZ LVR New Commitments Survey, bank private reporting (pre-2007)

with an LVR of above 80 percent reached about 30 percent in the middle of 2013, slightly higher than the share during the previous housing boom (figure 2), and the lending share with an LVR of above 90 percent was similar to the previous housing boom. A borrower with a higher LVR is more likely to cause losses for banks in the event of a default, and is more likely to default. There was also strong competition in the mortgage market, and market intelligence suggested that high-LVR mortgage lending would continue for an extended period if left unconstrained by regulations.

The Reserve Bank considered the use of a housing-based sectoral capital requirement (SCR) instead of the LVR restrictions. The SCR can improve the resilience of the banking system by temporarily boosting the capital held by banks for absorbing mortgage losses. The SCR may in theory have a moderating effect on house price and credit growth, through its influence on credit pricing. However, the effect of the SCR on these variables was expected to be limited, and therefore its effectiveness at mitigating a future downturn was assessed to be less

than the LVR. For this reason, the LVR tool was chosen instead of the SCR.

The Reserve Bank also increased the capital risk weights for high-LVR mortgages in early 2013, which strengthened the capital requirement of the banking system (RBNZ, 2013). While capital buffers increase the capacity of banks to absorb mortgage losses, the introduction of the LVR policy reflected a desire to mitigate the extent of the losses themselves. Adding to the vulnerability of the economy to a housing downturn was the high level of household debts, at 150 percent of household disposable income in early 2013, despite having fallen from 159 percent in 2009.

The Reserve Bank aimed to moderate house price inflation because it is concerned that this can exacerbate a future downturn, and not because house prices are an end goal. However, some of the Reserve Bank's past communications have heavily emphasised the concern with house price inflation, which may have led to a public view that LVRs would only be a success if they stopped house price growth:

A strong run-up in housing markets can be a risk to *future financial stability* because it can increase both the risk of a sharp correction and the consequent financial sector disruption. The Reserve Bank is concerned that the current escalation of house prices is increasing the probability and potential effect of a significant downward house price adjustment that could result from a future economic or financial shock (Wheeler, 2013).

The Reserve Bank would not be concerned about house prices when they are considered not to heighten the risk of a future correction. To put it another way, the long-run level of house prices or housing affordability are not an objective of the LVR intervention. The intermediate aims of LVR intervention by the bank have been rebalanced over time towards

strengthening household resilience and mitigating the scale of future economic downturns.

### *Tightening requirements for investors (2015-16)*

House price inflation slowed after the implementation of LVR restrictions. However, declining mortgage rates, strong migration, and a lack of new housing supply contributed to a resurgence in house price inflation between 2014 and 2016. Annual housing credit growth increased to 8 percent in 2015 (figure 3). House prices had increased by almost 70 percent from 2011 to October 2016, raising renewed concerns about the risk of a severe correction in prices (RBNZ, 2016b), which has the potential to impair the resilience of banks. The resurgence in house price inflation was strongest and most sustained in Auckland, where the house prices reached almost 10 times household income, a very high level by historic and international standards.



Heightened risks from investor lending were an increasing concern for the Reserve Bank. Investors accounted for a rising share of mortgage lending, as rapid increases in house prices unlocked additional borrowing capacity. The Reserve Bank view was that investor loans were likely to incur higher defaults and loss rates for a given LVR in a house price correction, reflecting stronger incentives for investors to default strategically and the high correlation between rental incomes and house prices movements (RBNZ, 2016a).

The Reserve Bank tightened the LVR requirements in two stages. The initial tightening was targeted at Auckland investors, reflecting the significantly higher risk of a housing correction and investor debt burdens associated with high house prices and low rental yields in the city. After housing risks eventually spread to the rest of New Zealand, the policy was broadened to cover all investor lending in October 2016. The maximum LVR for nationwide investor lending was lowered to 60. At the same time, the Reserve Bank did tighten baseline capital rules for investor mortgages, to reflect its view that investors are riskier than owner occupiers in a downturn.

Meanwhile, the potential for household indebtedness to amplify a future stress event was becoming a core aspect of the problem definition, owing partly to the worsening serviceability of new mortgage loans between 2014 and 2016. The overall household debt-to-income ratio (DTI) had risen to 160 percent in the June quarter 2016, to be above its 2007 levels. Over the year to June 2016, 30 percent of the value of new mortgages had a DTI of greater than 6, and more than 40 percent had a DTI above 5. Given a serviceability shock, indebted households could have amplified the impact of an economic downturn by reducing their consumption, selling their properties, or defaulting on their loans. That said, household debt servicing burdens were not severe at that time

(because of low interest rates), but were highly sensitive to any increase in interest rates.

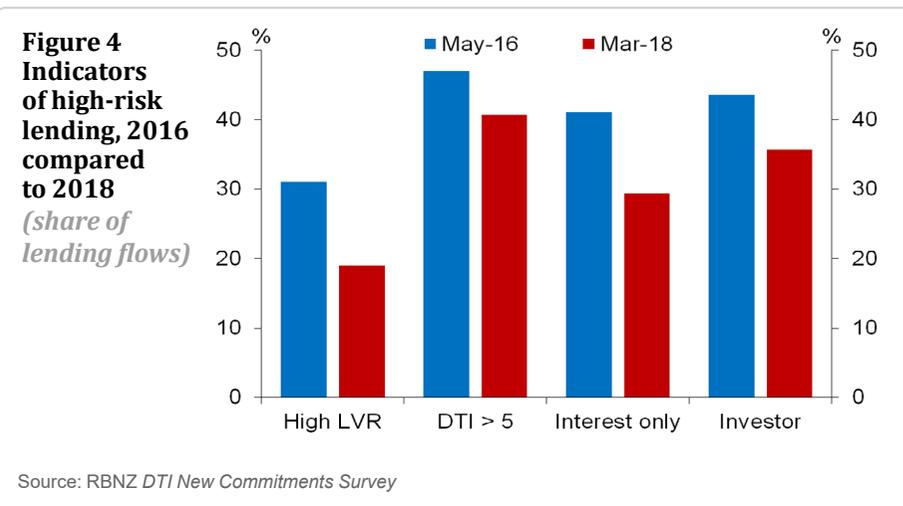
### *Easing the LVR policy (2017-18)*

The LVR policy restrictions were eased as the circumstances that led to benefits of the policy began to abate. The main benefits were, and continue to be, the enhancement of financial system resilience to a house price fall and the dampening of the housing credit cycle. On the other hand, the LVR policy comes with efficiency costs, in terms of constraining credit availability to some low equity (but credit-worthy) borrowers and imposing compliance burdens on banks. The Reserve Bank has begun easing the LVR policy in recent years, in response to:

(1) *Lower risk of a housing market correction:* House price and credit growth have slowed significantly since mid-2016. Slow house price inflation and credit growth allow time for the economic fundamentals (such as incomes and rents) to catch up. This should reduce the risk and magnitude of a correction in house prices, and is a benign way for asset overvaluation to adjust.

(2) *Prudent lending standards:* Bank lending standards tightened significantly between 2016 and early 2018, resulting in a reduction in various forms of high-risk lending (figure 4). There was a notable improvement in the debt serviceability of borrowers, reducing the risk that high debt burdens would amplify economic shocks. Banks have broadly maintained prudent standards after the easing of the LVR policy.

If the two conditions continue to be met, the Reserve Bank plans to further ease the LVR policy. The policy will be eased gradually to allow time to test whether these conditions are met. This will provide



confidence that further easing will not undermine the resilience of the financial system.

## 3 Impact on banking system resilience and economic stability

Conceptually, the LVR restrictions policy may positively influence the resilience of the banking system and the sustainability of economic growth (Bank of England, 2016).

The LVR restrictions can improve bank resilience by improving bank asset quality and reducing the scale of a potential house price fall. Given a stress scenario, a lower proportion of borrower equity relative to their loan amount (higher LVRs) is associated with a higher probability of

default, and magnifies the loss given default. The LVR restrictions can also reduce the magnitude of a housing downturn, by mitigating the fire sales of housing in a downturn, and by dampening the build-up of house price overvaluation leading up to the correction.

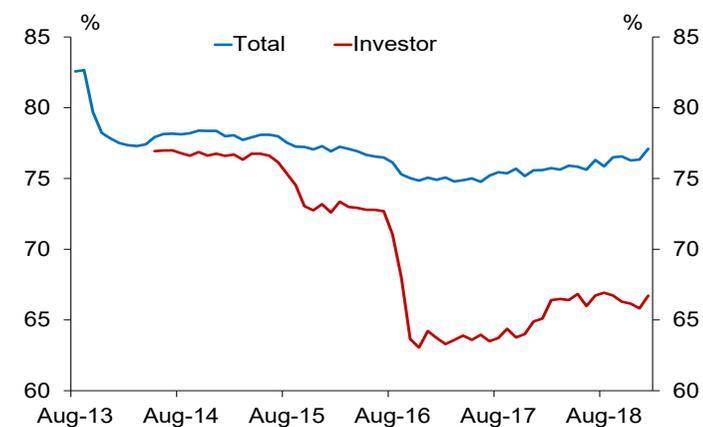
The LVR restrictions can mitigate the scale of economic downturns by reducing household indebtedness and enhancing borrower balance sheets. Given an unexpected fall in income or other stress events, heavily indebted households may become unable to service their debts or be forced to cut consumption, which would dampen economic activity.

The quantitative extent to which the LVR restrictions have improved the resilience of the banking system is analysed in depth in a supporting analytical note (Bloor and Lu, 2019). The first part of this section summarises the findings from the analytical note. The headline measure of bank resilience is the percentage share of banks' housing capital that would be consumed to cover mortgage defaults in a potential stress scenario. A lower (higher) share of housing capital consumed points to higher (lower) resilience. The modelling framework incorporates *three transmission channels* through which the LVR policy influences bank resilience. The broader contribution of the LVR policy in mitigating the magnitude of a potential economic downturn is discussed later in the section, although this benefit is not explicitly incorporated into the model.

### *Transmission channel 1: asset quality effect*

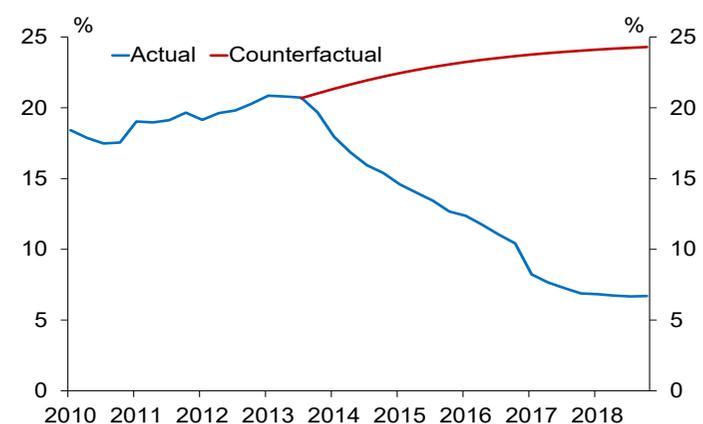
The LVR restrictions have reduced the share of new mortgage commitments with a relatively high LVR, and therefore shifted the LVR distribution of the mortgage portfolio lower over time. All else equal, this effect increases the resilience of the banking system. This is referred to as the *asset quality effect*. New mortgage lending with an LVR of above 80 percent has declined from a peak of 35 percent in 2013 to an average

**Figure 5**  
Mean above median LVR, aggregate and investors



Sources: RBNZ LVR New Commitments Survey, RBNZ calculations

**Figure 6**  
Share of high-LVR mortgage stock, actual and estimate without LVR policy



Sources: RBNZ LVR Lending Positions Survey, RBNZ calculation.

of 8 percent since 2014. Following the tightening of investor LVRs in 2016, the share of investor mortgages with an LVR above 60 percent fell from around 70 percent to 40 percent. Figure 5 summarises these impacts on the LVR distribution by showing the representative LVR for a

borrower in the top half of the LVR distribution (the ‘mean-above-median LVR’).

Bloor and Lu (2019) developed a model to estimate the LVR of mortgage lending in the counterfactual scenario where the LVR restrictions were not introduced, drawing on data collected by the Reserve Bank that reconciles the stock and flow of mortgage loans since 2013. The model suggests that, absent the policy, the share of the mortgage book with a LVR above 80 would have been 24 percent by December 2018, higher than the actual share of 7 percent (figure 6).

The lower exposure of banks to borrowers with high LVRs, especially to investors with high LVRs,<sup>5</sup> is expected to reduce the scale of mortgage losses in a potential house price downturn. There is limited empirical evidence on the relationship between LVRs and stressed loss rates in New Zealand, given the absence of a severe housing downturn in recent decades. To quantify the impact of lower LVRs on mortgage loss rates, Bloor and Lu (2019) draws on default and loss rate data from the Reserve Bank’s stress tests of major banks.<sup>6</sup> Banks submitted estimates of mortgage loss rates for a range of LVRs under a stress scenario, and these were applied to the LVR distribution under the LVR policy and that under the counterfactual scenario. The exercise suggests that mortgage losses would be 29 percent lower as a result of the asset quality effect of the policy.

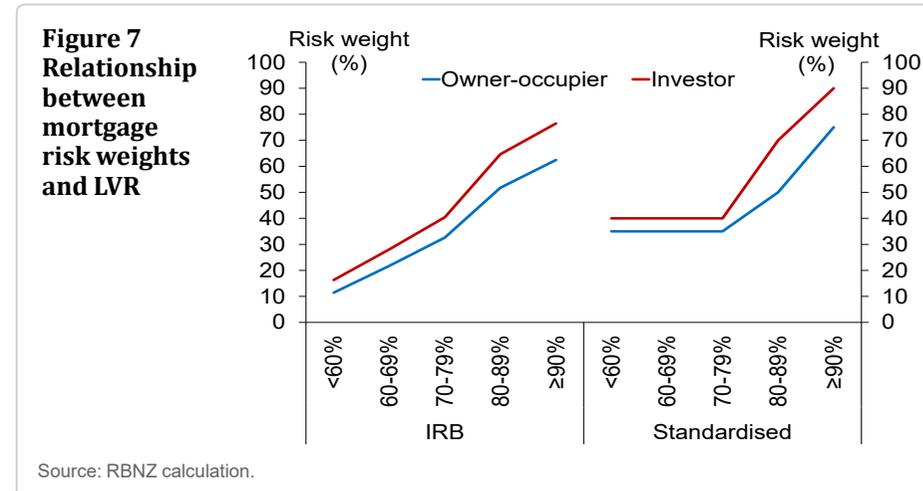
5 Studies on the post-GFC experiences in Ireland (Kelly and O’Malley, 2014; Central Bank of Ireland, 2014) and the UK (McCann, 2014; HM Treasury, 2015) show that loss rates on investor lending are significantly higher than on owner occupier lending.

6 The stress scenario assumes a baseline development of a 35 percent fall in house prices and a 5 percentage-points increase in the unemployment rate (see Lily (2018) on scenario calibration). As discussed in the supporting Analytical Note, similar estimates were obtained using a structural model to project default and loss rates (TUI).

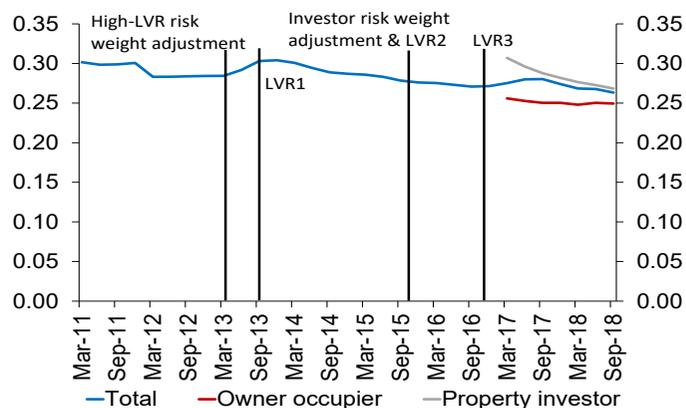
## Transmission channel 2: Risk weight effect

The improvement in mortgage portfolio resilience has led to a decline in mortgage risk weights, because the amount of capital that banks are required to use is sensitive to their credit risk. Mortgage risk weights bear a positive relationship with the LVR of mortgage borrowers (figure 7). For a given volume of mortgage lending, a fall in risk weights leads to a reduction in housing asset volumes on a risk-weighted basis, meaning that less capital needs to be held by the bank.

The model estimates that, as a result of the improved equity positions of borrowers, the average mortgage risk weight declined by 26 percent owing to the fall in high-LVR mortgage lending. This result suggests that the asset quality effect of the LVR restrictions policy, which improves banking system resilience when viewed in isolation, is mostly offset by the risk weight effect that lowers banks’ capital buffers, although not



**Figure 8**  
Residential  
asset risk  
weights  
(%)



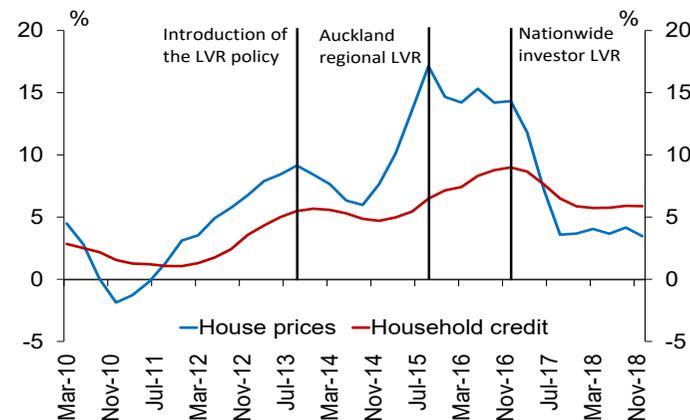
Sources: RBNZ Capital Satellite Survey, bank private reporting

entirely.<sup>7</sup> Within this net impact, the LVR policy has resulted in borrowers having more equity in their homes, and banks holding less capital in response.

The calibration of housing mortgage risk weights was subject to two reviews between 2013 and 2015, which increased the risk weights for high-LVR mortgages and investor mortgages. As a consequence, the actual mortgage risk weight has declined by only 6 percent since 2013 (figure 8). This experience suggests an important role for baseline prudential standards to complement the LVR restrictions policy to improve the resilience of banks. Baseline prudential settings could be reviewed as part of the decision-making process of macroprudential policy.

<sup>7</sup> If risk weights understate the true risk of high-LVR mortgages, the reduction in mortgage losses caused by lower LVRs should outweigh the reduction in housing capital, leading to a net benefit for resilience. If risk weights overstate the risk of high-LVR mortgages, the fall in LVRs is actually detrimental to bank resilience.

**Figure 9**  
House  
price and  
household  
credit growth  
(annual  
percent  
change)



Sources: RBNZ Bank Balance Sheet Survey, Real Estate Institute of New Zealand

### Transmission channel 3: Indirect feedback effect

The final transmission channel, the *indirect feedback effect*, improves the resilience of the banking system. This effect arises from the LVR policy's mitigation of the magnitude of a potential house price fall, which reduces the extent of negative borrower equity. The risk of a housing downturn has increased significantly over the past five years. Since 2013, the nationwide house price-to-income ratio has increased from 5.3 to 6.6, to be much higher than its 20-year average of around 5. Based on the divergence between the current house price-to-income ratio and its historical average, house prices could decline as much as 40 percent in a stress scenario.<sup>8</sup> However, the pertinent question is whether the risk of a house price correction would be larger in the counterfactual scenario. There are two ways the LVR policy can mitigate a potential fall in prices:

<sup>8</sup> Another way to measure overvaluation is a discounted cash-flow model, which decomposes a buyer's willingness to pay for a house into rental yields, mortgage interest rates, and maintenance costs and expected capital gains. The expected capital gains can be viewed as overvaluation if is overly optimistic.

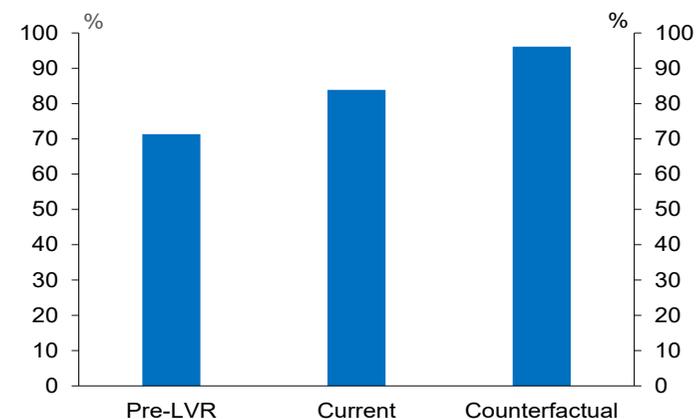
The LVR restrictions may be able to dampen house price overvaluation. Previous analysis by the Reserve Bank suggests that the cumulative dampening effect of the LVR policy on house price inflation is around 5 percentage points (Price, 2014; Yao et al. 2018). LVR tightening tended to have only a temporary impact on house price growth, with most of the impact experienced within the first six months (figure 9), but any impact on growth will translate into a permanent impact on the level of house prices.

The LVR policy may have reduced distressed house sales in a potential stress scenario by reducing stressed mortgage default rates. The decline in the share of investor loans is also likely to reduce the scale of a house price downturn. In general, the greater the presence of investors on banks' mortgage books, the more salient is the risk of large fire sales given a severe fall in house prices, owing to both defaults (as rental incomes and debt serviceability deteriorates) and a more trader-like incentive to exit the housing market as the cycle turns.

Taking into account both of these effects, a conservative estimate of the impact of the LVR policy in limiting the decline in stressed house prices is 5 percentage points. In the counterfactual scenario without the LVR policy, a higher starting point for house prices and greater fire sales could see a house price decline of more than 45 percent, higher than the 40 percent assumption based on current conditions.

While the LVR policy can lean against the systemic risk posed by a house price fall, it cannot be expected to address the risks stemming from housing market exuberance all on its own. Many other factors affect house price inflation, and as explained here, the LVR policy is not designed to target a particular level of house prices. Broader policy reforms would address housing supply shortages, the distortions associated with the taxation regime (see Hargreaves, 2008) and high net

**Figure 10**  
Credit losses  
as a share  
of housing  
capital  
requirement



Sources: RBNZ calculation

migration, which are fuelling house price inflation and risks of a correction in the future should these drivers weaken.

### *Aggregate policy effect on banking system resilience is positive*

Bloor and Lu (2019) points to a quantifiable benefit for banking system resilience from the LVR policy. Figure 10 presents our most reliable estimate of the overall impact of the LVR policy on the resilience of the banking system. Mainly reflecting higher house prices, banks are more vulnerable to a severe housing market correction currently than in 2013, with losses rising from 71% to 84% of housing capital. However, had the Reserve Bank not imposed LVR restrictions, the losses would be 96% of housing capital.<sup>9</sup> On this measure, the LVR policy has lessened potential mortgage losses as a share of housing capital by 12 percentage points. Another interpretation is that the LVR policy has prevented around half of

<sup>9</sup> This counterfactual assumes that we still would have made separate adjustments to the capital regime.

the deterioration in banking system resilience that would have occurred without the policy.

An alternative to increasing bank resilience would have been to increase capital. The advantage of the LVR policy over capital-based macroprudential tools is that the former has a larger impact in reducing the build-up of risky mortgages. This has prevented vulnerabilities developing in the household sector that may not have been well managed by banks. As a result, the policy has had a more potent impact in reducing the risk associated with the credit cycle, lowering the likely increase in defaults and losses during a stress scenario, and mitigating the size of the downturn in house prices. As discussed below, the policy is also likely to mitigate the decline in economic activity.

### *LVR policy may also support sustainable economic growth via consumption*

A severe fall in house prices can have a significant adverse impact on consumption by lowering household wealth. We have shown that the LVR policy has reduced the magnitude of a potential house price decline, which should support consumption in a downturn and support sustainable economic growth. Another channel by which the LVR policy can support long-run economic growth is by dampening the extremes in the household debt cycle. These effects would have flow-on benefits for banking system resilience, through lower defaults in the business loan portfolio.

Both an elevated level of household debts and rapid growth rates in debts have the potential to increase the vulnerability of the economy to negative shocks. In a stress scenario, highly indebted households may be forced to deleverage and in the process reduce their consumption heavily, leading to an amplification of the downturn (Bank of England,

2016). This amplification can lead to a rise in defaults in the non-mortgage areas of banks' loan portfolios. For example, in Ireland private consumption fell sharply over the course of the GFC as housing wealth contracted, with retail sales declining by nearly 20 percent year-on-year by 2009. This, together with the crunch in credit availability as bank distress increased, contributed to widespread defaults on business loans. By 2013, more than 40 percent of outstanding SME loans in Ireland were in default (Central Bank of Ireland, 2017). A similar dynamic is observed in the US, where retail sales contracted 10 percent year-on-year by the middle of 2009, contributing to a rise in commercial loan defaults.

A lack of recent severe downturns for New Zealand means it is difficult to estimate the relationship between household indebtedness and spending given a downturn. However, regressions based on the Household Economic Survey show that higher household indebtedness does negatively impact on consumption in New Zealand (Yao et al, 2019). This suggests that, to the extent that the LVR policy dampened the debts of households, it may have also reduced the potential non-mortgage losses for banks.

The 2013 introduction of the policy, as well as the 2016 tightening of the investor restrictions, were followed by slowing growth in household debts. Price (2014) estimated that the introduction of the LVRs in 2013 had lowered housing credit growth by 1 percentage point. An internal study found that the third LVR tightening reduced housing credit growth by 3 percentage points, using the framework outlined by BIS (Gambacorta and Murcia, 2017). These estimates suggest that the cumulative impact of the three LVR tightening on household credit growth is 5 percentage

points. Without the LVR policy, the household debt-to-income ratio would sit at 172 percent, compared to the actual level of 164 percent.<sup>10</sup>

Bridges *et al.* (2017) estimated the relationship between household credit and the severity of recessions using a panel dataset of 26 advanced economies. Based on their estimates, the reduction in household debts in New Zealand from the LVR policy could bolster real GDP per capita during a potential downturn by 0.8 percentage points.<sup>11</sup> Other international evidence also suggests that the LVR is a determinant of the response of household consumption to a downturn.<sup>12</sup>

## 4 Potential side effects and unintended impacts

The LVR policy could have impacts beyond financial stability, with the potential to undermine other objectives of public policy. This section discusses a range of these side effects, including the impact on allocative efficiency, housing affordability, monetary policy, competition and housing supply.

<sup>10</sup> Related to the relationship between the LVR policy and household indebtedness, Shaar (2018) finds that the share of owner-occupiers with an elevated debt-to-income ratio has declined in the post-LVR period.

<sup>11</sup> For comparison, Jorda *et al.* (2015) found that real GDP declines by around 4 percent during house price busts preceded by strong credit growth.

<sup>12</sup> Dynan (2012), based on an analysis of US household survey data, found that high-LVR households reduced their spending by more than less indebted households during the GFC. Mian *et al.* (2013) found that US households with high LVRs reduced their spending on cars by more than low-LVR households, for a given fall in the value of their home during the GFC.

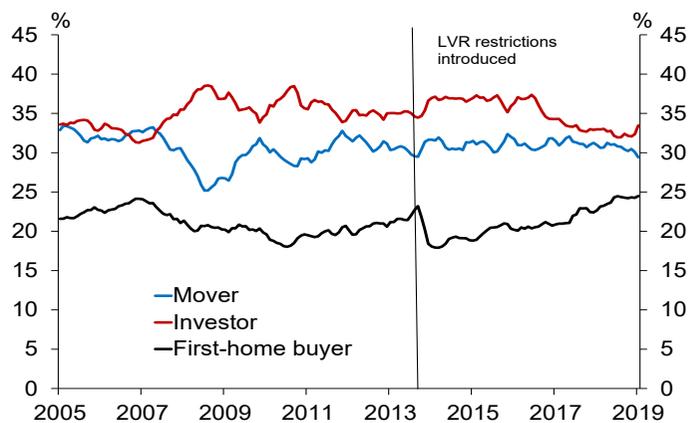
### *All macroprudential tools can incur efficiency costs, although LVR restrictions are more intrusive*

As noted, the LVR policy aims to prevent vulnerabilities developing in the household sector that would not be well managed by banks, by restricting risky borrowers who contribute to the scale of a future housing downturn. This effect contributes to the allocative efficiency of the financial system and supports economic growth over the long term. However, the LVR restrictions may also restrict lending to some borrowers who are able to service the loan, but who have insufficient housing equity to meet the LVR requirements. This effect is negative for allocative efficiency in credit provision and, together with the policy's dampening of house prices, can reduce short-run economic growth.

All macroprudential tools have the potential to negatively impact on allocative efficiency, and therefore the benefits of any macroprudential intervention must be weighed against the cost. For example, capital-based interventions will increase the cost of capital in the banking system, which could lower economic growth if lending rates increase or credit supply falls. However, the LVR restrictions have a much stronger and more direct effect in restraining the credit access of affected borrowers, and the flexibility of banks to lend to borrowers. Therefore, while the LVR instrument is more potent at reducing risky lending than capital macroprudential tools, this comes at a price of a larger reduction in overall credit supply and potentially weaker economic growth, at least in the short term.

The benefit from an LVR intervention would be small if vulnerabilities in the household and housing sectors are not high, but the costs would remain in terms of lower allocative efficiency and greater intrusiveness on borrower choices. Therefore, the nature of the risk environment has implications for the choice between deploying the LVR tool and capital

**Figure 11**  
Share of  
house sales  
by buyer type



Source: Corelogic

macroprudential tools.<sup>13</sup> Both the LVR and capital tools present potential efficiency costs, but capital tools permit borrowers and lenders more flexibility than the LVR tool. Increasing bank capital requirements may be preferable in situations where there is no conclusive evidence that vulnerabilities in the household and housing sectors present a major risk to the financial system.

### *Impact on first home buyers has declined*

The LVR policy is likely to prevent some households that wish to purchase housing from doing so, which is part of the process of safeguarding financial stability. However, this means that the LVR policy can negatively affect a public policy objective of housing affordability, including for first home buyers.

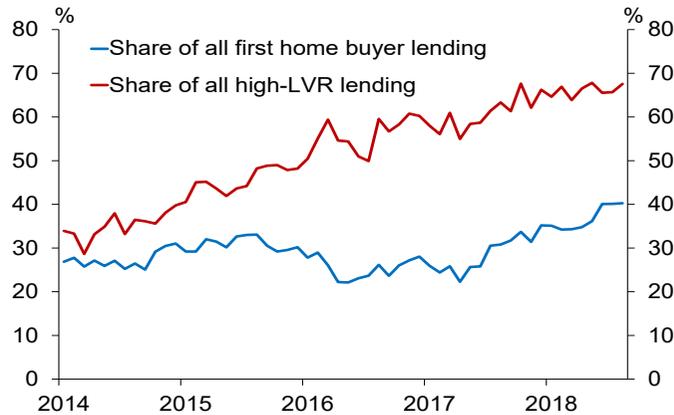
A uniform LVR setting for all borrowers tends to disproportionately affect first home buyers. First home buyers are generally young and in an early stage of their careers, therefore their savings tend to be smaller than other buyers. Moreover, first home buyers have never owned any housing, and have not benefited from previous house price inflation. Related to this, in a rising market the impact of LVR restrictions are generally temporary for investors, because continued house price inflation will boost investor asset values, but the effect on first home buyers is more durable. Based on Corelogic sales data, the first home buyer share of house sales fell from around 25 percent before the LVR policy took effect in October 2013, to below 20 percent by early 2014 (figure 11). While data on lending breakdown by buyer types were unavailable for most of this period, banks and mortgage brokers point to a disproportionate reduction in lending to first home buyers.<sup>14</sup>

In some contrast to the decline in first home buyer activity, house sales to property investors were not significantly affected by initial LVR restrictions, leading to their share of sales increasing. Starting in 2015, the LVR restrictions were incrementally calibrated to be more targeted at investor lending, which was viewed as a greater risk. New lending to investors declined sharply after the introduction of the nationwide investor LVR policy in October 2016, and house sales to investors fell as a share and in an absolute sense. This contributed to the rising share of FHB purchases after 2016. The share of new mortgages going to FHBs has risen to 17 percent by the end of 2018, up from just 10 percent in 2014 and 2015. The appropriate calibration of the LVR policy can make restrictions more targeted at risky areas, and reduce the potential tension with other public policy objectives.

<sup>13</sup> In addition to the LVR, the macroprudential toolkit includes instruments focused on banks' balance sheet. The Reserve Bank's framework for choosing between the available macroprudential instruments is discussed in more depth in Ovenden (2019).

<sup>14</sup> Relatedly, Shaar (2018) finds that the average age of home buyers increased in the years after the LVR policy was implemented. However, this is likely to mainly reflect the impact of rising house prices over this period.

**Figure 12**  
First home  
buyer high-  
LVR lending



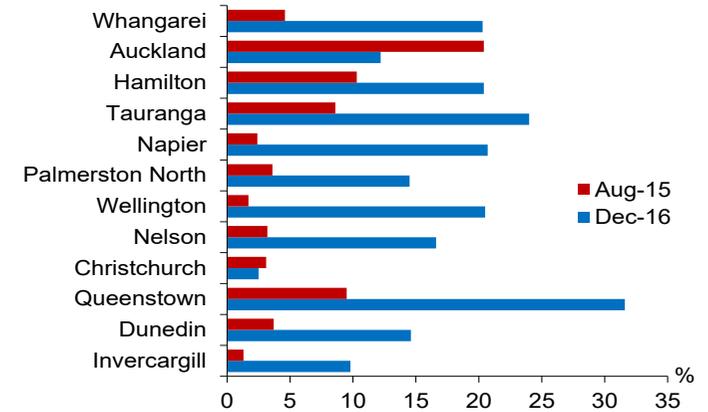
Source: RBNZ LVR New Commitments Survey

While FHB purchases fell after the policy was implemented, they have recovered and remain approximately in line with the average of the series between 2005 and 2012. There are several factors that supported ongoing FHB purchases, besides the tightening of LVRs for investors in 2015 and 2016. FHBs have tended to receive a disproportionate share of the high-LVR speed limit available under the policy (figure 12), and have conditional access to welcome home loan (WHL) exemptions. Around 35 percent of FHB loans are currently high-LVR, of which around 5 percentage points are WHL and the remainder are speed limit usage. Some FHBs have been able to access funding or guarantees from their parents, although hard data are unavailable. Finally, some FHBs have been able to adjust by purchasing at the cheaper end of the market.

### *Regional LVR policy can create demand spill-overs*

The second LVR adjustment involved a tightening of restrictions for Auckland investors, and an easing for borrowers outside of Auckland. The implementation of the Auckland LVR policy was followed by a large

**Figure 13**  
Annual  
house price  
inflation in  
urban areas



Source: Real Estate Institute of New Zealand

decline in house sales for Auckland and in house price inflation from an elevated pace. However, it also coincided with a strong pick-up in house price inflation and house sales in the rest of New Zealand (figure 13), led by regions in the North Island, including the Waikato, Bay of Plenty and Wellington. Analysis of sales data suggests there was a significant increase in Auckland investors purchasing in neighbouring regions (Corelogic, 2016). That said, the regional markets tend to follow the Auckland market, and low affordability in the super city had probably already driven some home buyers to search for cheaper options elsewhere. Therefore, the Auckland LVR tightening is just one contributing factor to the surge in nationwide housing demand in 2015.

This experience suggests that a region-specific LVR policy has the potential to displace housing demand from the targeted region to elsewhere, potentially undermining the policy aims at the national level. That said, a region-specific LVR policy can be effective in having a braking impact on housing demand and address the concentration of risk in a regional housing market. Whether a regional policy is appropriate

depends on how unbalanced the risks are across regions and the capacity for regional policy to create spillovers.

### *Distortion to housing market activity*

The announcement of the introduction of the LVR policy led some buyers to bring forward their purchases prior to implementation of the policy, and the same effect was observed in Auckland leading up to the second tightening. In theory, putting pressure on buyers to hasten their purchase represents a distortion to market outcomes, and can undermine the effectiveness of the policy. However, the actual impact on market activity is small relative to the typical volatility in home purchases data. By the time the nationwide investor LVRs were announced in July 2016, banks were applying the new benchmarks to some extent before the implementation, and there was no sign of a rush to purchase. Each LVR tightening also forced banks to cancel the pre-approvals of some prospective borrowers, to ensure compliance with the restrictions. This led to significant inconvenience and uncertainty for some prospective buyers, given heightened housing demand.

There are compliance costs for banks in terms of administering the LVR policy. While banks have outlined the system changes needed to comply with policy, they generally have not provided cost figures. However, banks already have LVR benchmarks as part of their internal risk management, which should limit the compliance cost relative to the societal benefit of improved financial stability. The compliance cost from a future tightening or re-implementation of the LVR policy would be mitigated by the fact that banks have already developed the system for loan processing and data reporting necessary for compliance.

### *The LVR tool is not suitable as a lever of monetary policy*

The LVR policy can potentially reduce household demand and economic growth in the short run by constraining house price inflation and housing market activity. This has implications for monetary policy, to the extent that it results in weaker inflation pressure. At the time of the first LVR intervention, the Reserve Bank estimated that the reduction in house price inflation would contribute to the Official Cash Rate being 25-50 basis points lower than it would otherwise be. This estimate was produced using past empirical relationships embedded in the Reserve Bank's forecasting model. Recent evidence suggests that the relationship between house prices and consumption has weakened in recent years, and that the actual impact on the OCR setting has been smaller than initially estimated (Wong, 2017).<sup>15</sup>

As per the Policy Targets Agreement, the Reserve Bank seeks to avoid unnecessary instability in output, interest rates and the exchange rate in its conduct of monetary policy. The LVR policy operates by restraining domestic (or non-tradables) demand, and therefore does not have a clear impact on the exchange rate, unlike the OCR. This can be useful for monetary policy objectives when the New Zealand dollar is elevated, as increases in the OCR aimed at restraining domestic demand will put more pressure on the dollar exchange rate and New Zealand's export sector. To the extent that the LVR policy has reduced the need for OCR increases by dampening domestic demand, it may have helped to reduce the upward pressure on the exchange rate (Wheeler, 2013). However, Dunstan (2014) assessed that this effect is small in relation to other

<sup>15</sup> Wong (2017) estimates New Zealand households' marginal propensity to consume in response to changes in housing wealth. In the sample from 2005 to 2016, the author finds that a 1 percent increase in per capita housing wealth and net financial wealth is associated with a 0.15 percent increase in real per capita consumption. This represents a lower marginal propensity to consume than in the sample from 1982 to 2004, which suggests that a 1 percent increase in per capita housing wealth and net financial wealth is associated with a 0.24 percent increase in per capita consumption.

factors affecting the exchange rate, as the impact of the LVR policy on the optimal OCR setting is minor. The LVR policy can delay, but is no substitute for, a monetary policy tightening cycle.

The experience shows that the LVR is not suitable as a tool for stabilising domestic demand and pursuing monetary policy goals in any significant capacity. However, the impact of the LVR setting on domestic demand and inflation should be considered when making decisions on monetary policy.

### *Flexible exemptions should mitigate policy impact on new housing supply...*

The initial implementation of the LVR restrictions in October 2013 did not permit an exemption to construction lending. After further consultations with the building industry and banks raised concerns about the impact of the policy on new housing supply, the Reserve Bank included a construction exemption in December 2013. In addition to the potential efficiency impact of restraining construction sector activity, this reflected a view that the benefits of increased supply in terms of reducing the medium-term risks in the housing sector outweigh the risk of weaker lending standards on new builds. Consequently, the purchase of new dwellings became exempt for both owner occupiers and investors. The availability of the remediation exemption also suggests that the policy has not impacted on finance for other works, including seismic strengthening, insulation and weather-tightness.

The construction exemption has been broadened over time to cover purchases of a property before it is completed or less than six months afterwards, and top-ups arising from cost overruns during the building process. The broadening of the exemption partly reflected that there was very little evidence of the exemption resulting in excessive growth in

high-risk lending. This illustrates a more general point that exemptions to the LVR policy have not resulted in significant policy leakage, which was a concern for the Reserve Bank in designing the policy in 2013. This suggests that exemptions can be designed in a non-prescriptive fashion, supported by ongoing monitoring to ensure that banks comply with the spirit of the policy.

While banks are generally not constrained by the LVR policy in approving construction finance, they are cautious in the current environment. Concerns around risk of construction cost overrun and inexperienced players in the industry have underpinned part of this caution. As a result, banks tend to set relatively strong origination standards for construction finance, which may include an internal LVR limit. There may have been a small effect on new housing supply from the LVR policy owing to the additional uncertainty on the future house price path. Developer margins have been impacted by cost inflation and increases in residential land prices, making the profitability of a project sensitive to small falls in house prices. These issues suggest that concern around development finance availability may be better addressed by structural reforms to improve the efficiency of the construction industry, urban development policies that are more responsive to growth, and more competitive land markets.

### *...and the health of bank competition in high-LVR mortgages*

There is a degree of tension between the LVR policy and competition, given that the LVR policy is designed to prevent banks from competing on certain dimensions of lending standards. By calling out certain classes of borrower as high risk, the policy can co-ordinate banks' pricing, and

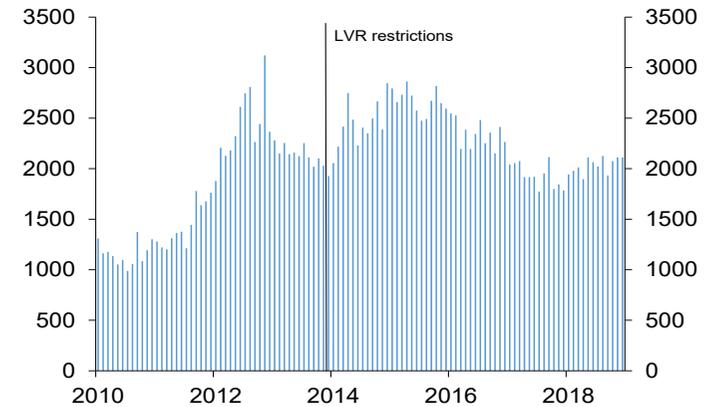
make it difficult for these customers to seek better mortgage rates or terms from other banks.<sup>16</sup>

Although policy intervention is necessary at times to safeguard financial stability, the Reserve Bank aims to mitigate any adverse effects on competition. A refinancing exemption to the LVR policy allows high-LVR borrowers to switch banks without increasing their debt. Banks still increased pricing to ration high-LVR lending after the policy came into effect, but the impact was limited by competition from other banks. Refinancing exemptions amounted to 3 percent of gross new mortgages over the past three years, or on average 14 percent of all lending at above the LVR policy threshold. In comparison, refinancing commitments represent 16 percent of all new mortgages, which is only slightly higher than the rate of switching at above the LVR threshold. This shows that there is solid uptake of the refinancing exemption, and this is effective at supporting competition for high-LVR lending. The Reserve Bank also monitors data on the number of borrowers switching mortgage provider. There were no noticeable changes in the level of switching after the LVR policy was introduced (figure 14).

### *Marginal impact on rents*

The LVR policy can theoretically have a small upward effect on rents if it reduces the supply of rental properties. A fall in the rental share of the housing stock would be associated with a fall in the demand for rentals, as ex-renters shift into owner occupation. However, rental dwellings tend to be more intensely occupied than owner occupied dwellings, and therefore the fall in the demand for rentals may be less than the fall in the

**Figure 14**  
Number of  
borrowers  
switching  
mortgage  
provider



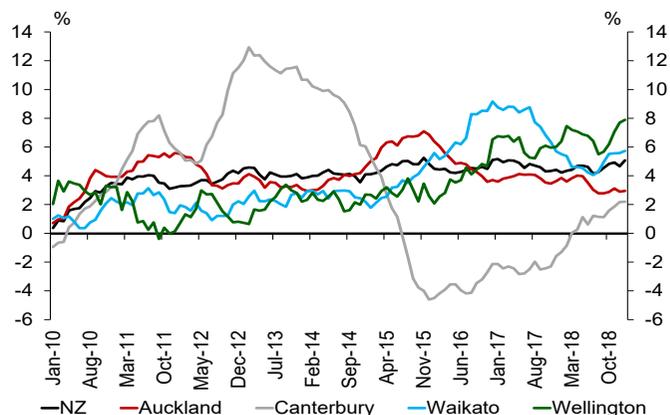
Source: Corelogic.

supply of rentals. All else equal, this would put pressure on rents to rise, particularly if new supply is unresponsive.

The investor LVRs introduced in October 2016 may have put modest pressure on rents to rise, by reducing sales to investors. The investor policy may have reduced the share of rental properties in the housing stock by 0.2 percentage points in 2017. This small impact is indiscernible from the more salient factors affecting rents. Growth in rents at the national level was led by Auckland in 2014 and 2015, owing to population growth, and driven by Wellington afterwards as a result of supply shortages (figure 15). An offset for national rent inflation was the fall in Canterbury, where the residential earthquake rebuild resulted in high rental supply. Policies aimed at dwelling supply, migration settings and rental quality is likely to have a greater impact on rents than the LVR policy.

<sup>16</sup> As an illustration of this point, an inquiry by the Australian Productivity Commission found that restrictions on property investor and interest-only loans by the Australian Prudential Regulation Authority (APRA) introduced for Australian banks had a negative impact on the pricing of these loans (Australian Productivity Commission, 2018). Australian banks generally raised the mortgage rates charged on investor and interest-only lending to limit applications and maximise profits.

**Figure 15**  
Annual growth in rents, 6 month average



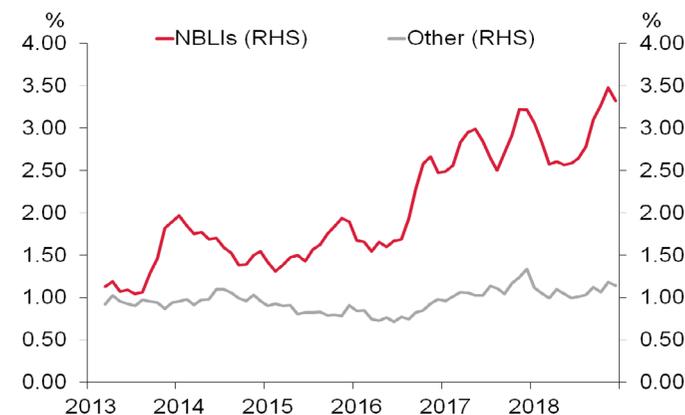
Source: Ministry of Business, Innovation and Employment

### Disintermediation effect on housing credit flows is not significant

The imposition of the LVR policy on registered banks has the potential to result in growth in high-LVR lending by institutions that are outside the regulatory perimeter (non-bank lending institutions (NBLIs)). We call this effect *disintermediation*. High-LVR lending on a substantial scale by entities not captured by the policy would undermine the policy's financial stability goal, by reducing its impact on household resilience. In addition, disintermediation could negatively impact financial system efficiency, as NBLIs are likely to incur higher costs in providing the loan and weaker screening of borrowers. The potential for disintermediation to develop over time is one reason why the Reserve Bank chose to implement the LVR policy as a temporary, rather than enduring, restriction.

Since the start of 2016, there has been a noticeable increase in the *flow* of new mortgage lending by NBLIs from a low baseline level, including those at high LVRs (figure 16). The *stock* of outstanding mortgage credit held by NBLIs currently represents only 1.0 percent of the outstanding

**Figure 16**  
Share of mortgaged purchases funded by non-banks



Source: Corelogic

mortgage in the financial system, up from 0.7 percent at the start of 2016. That said, the value of mortgages held by NBLIs was falling before 2016, when the LVR policy had been in place for two years. We have data only on the LVRs of mortgages for non-bank lenders who take deposits. The stock of mortgages with an LVR of greater than 80 held by non-bank deposit-taking institutions has increased fourfold since 2013, but it still represents less than 1 percent of total mortgages with an LVR of above 80.

Most of the rise in non-bank lending (both high and low LVR) appear to be construction, remediation and other specialist loans, and bridging finance. There are genuine high-LVR mortgages in the pick-up. Some of these borrowers fall short of obtaining high-LVR lending from banks by a small margin (e.g. small past impairments or insufficient income verifiability), and they are likely to switch to banks after building up their housing equity to obtain a lower mortgage rate. The small size of the disintermediation suggests little concern that the LVR policy is being

undermined, and capital constraints should present a material limitation to further significant growth in high-LVR lending by NBLIs.

The lack of significant disintermediation suggests that the policy can remain effective over time. As risks abate, the need to consider easing the LVR policy still applies. However, the observation that the policy can remain effective on a persistent basis supports a cautious and gradual easing path.

## 5 Conclusion

The LVR policy has improved financial stability. The Reserve Bank's modelling analysis suggests that the policy has improved the capacity of the banking system to withstand a severe housing-led downturn, primarily through reducing the magnitude of a house price correction. The intervention also supported sustainable economic growth, through shifting credit allocation towards credit-worthy borrowers. The policy has been more potent in addressing risks in the housing sector, and mitigating an economic downturn, than alternative macroprudential tools.

The LVR policy comes with drawbacks. The policy has restricted some credit-worthy borrowers with high debt serviceability, but low equity, from purchasing houses – an effect that reduces allocative efficiency. The LVR restrictions have also created tension with other public policy objectives, for example housing affordability for first home buyers. These costs have been mitigated to an extent by the policy's calibration, including the use of speed limits and exemptions for construction and refinancing. Table 2 summarises the main benefits and drawbacks of the LVR policy.

**Table 2**  
**Benefits and costs of the LVR restrictions policy**

Benefits	Drawbacks
Enhance banking system resilience	Restrict some credit-worthy borrowers
Support sustainable economic growth	Tension with other public policy objectives

On balance, this review considers that the LVR policy has helped to fulfil the Reserve Bank's statutory objective of promoting the soundness and efficiency of the financial system. Disintermediation to the policy has not been significant, suggesting that the policy will remain effective for longer than the Reserve Bank had expected in 2013. However, the LVR tool is only part of a broader prudential framework that tackles risks. For example, two adjustments to the calibration for housing capital requirement have been helpful for bolstering bank resilience, highlighting the need for a strong prudential baseline.

Macroprudential policy fulfils a niche in leaning against cyclical risks to financial stability. It is not suitable as a tool for conducting monetary policy, or to achieve social goals such as housing affordability. The policy impact on house price inflation is temporary, and reforms in residential land markets and the construction industry remain integral to boosting the supply of housing and addressing low affordability.

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