



## **Regulatory Impact Assessment of revised LVR restriction proposals September 2016**

### **ADEQUACY STATEMENT**

This RIA has been produced by the Reserve Bank in accordance with the requirements of section 162AB of the Reserve Bank of New Zealand Act 1989 (the Act). Also, the Reserve Bank is satisfied that the RIA has been produced in a way that is consistent with the Government Statement on Regulation.

## INTRODUCTION

A sharp correction in house prices represents a key risk to the financial system, and one that is increasing the longer the current boom in house prices persists. A severe downturn in house prices could have major implications for the banking system, with over 55 percent of bank loans secured against residential property. Moreover, elevated household debt levels and a growing exposure of the banking system to investor loans could reinforce a housing downturn and extend reductions in economic activity, as highly indebted households are forced to reduce consumption and sell property.

The Memorandum of Understanding on macro-prudential policy with the Minister of Finance (MoU) sets out a range of macro-prudential tools that can potentially be used to mitigate rising systemic risks associated with the housing market. The objectives of using macro-prudential tools are to (i) provide additional buffers to the financial system that vary with the credit cycle and (ii) help to stabilise economic activity by dampening extremes in the credit cycle.

Despite the financial stability benefit imparted by the previous LVR policy, the risk of a damaging correction in house prices has continued to increase. The Reserve Bank is implementing the following adjustments to the LVR policy from 1 October in order to further mitigate risks to financial stability:

1. Applying a nationwide speed limit for all investor lending, permitting no more than 5 percent of lending at an LVR greater than 60.
2. Applying a nationwide speed limit for all owner-occupier lending, permitting no more than 10 percent of commitments with an LVR of greater than 80.

These changes involve a large tightening in credit availability for investor lending, and a small tightening for owner-occupiers. In addition, the changes simplify the previous LVR policy by removing the differential treatment of lending in Auckland and the rest of New Zealand.

This document contains a regulatory impact assessment (RIA) of these adjustments to the LVR policy. Drawing on the decision-making framework for macro-prudential policy published in RBNZ (2013), the RIA is made up of four sections containing:

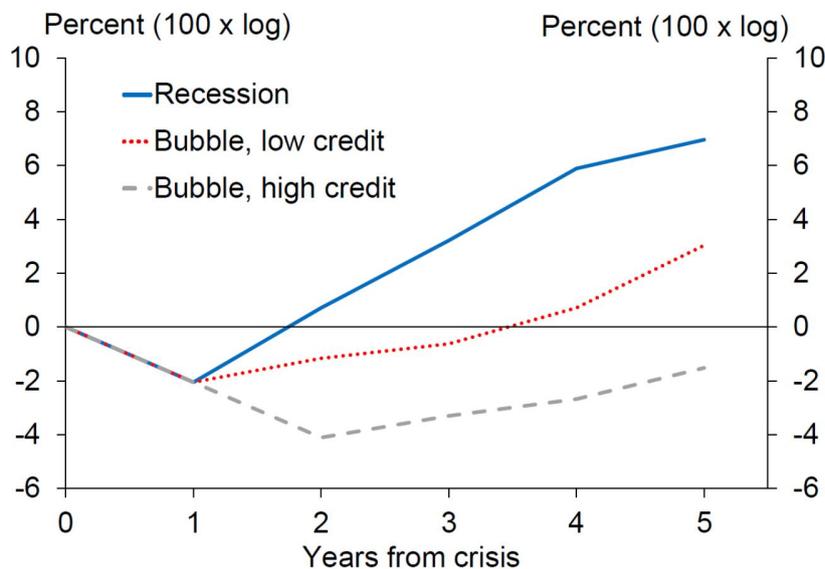
- an identification of the problem under status quo policy settings;
- a description of the options considered and the reasoning for choosing the preferred option;
- a cost-benefit analysis of the preferred policy relative to the status quo; and
- a description of the consultation that has taken place during the development of the policy, and the process for implementation, monitoring and review of the policy.

Several sections of this assessment are substantially based on the consultation paper that introduced this policy proposal (RBNZ (2016)), modified based on the subsequent consultation process. It is also worth noting that the 2013 RIA for the original introduction of LVR restrictions remains relevant.

## SYSTEMIC RISK ASSESSMENT

The Reserve Bank is concerned that the risk of a sharp fall in house prices poses a growing threat to the stability of the financial system. Rapid growth in housing debt is a key early warning indicator of future periods of financial stress (Anundsen et al (2014)). Several advanced economies experienced rapid rises in mortgage losses following the GFC, with losses reaching more than 5 percent of mortgage loans in both the US and Ireland. Cross-country evidence also suggests that housing busts tend to be associated with a large and persistent decline in economic activity, especially if preceded by strong increases in house prices and above average credit growth (figure 1). Sharp reductions in consumption by highly indebted households played a role in exacerbating the decline in economic activity during these episodes (Thornley (2016)). Although residential mortgage losses had a smaller direct impact on bank balance sheets in earlier financial crises, this may have been due to the exposure of households and banks to the housing market being significantly lower (Kragh-Sorenson and Solheim (2014)).

Figure 1  
Paths of GDP after housing bubbles in selected advanced economies  
(1870 – 2013)



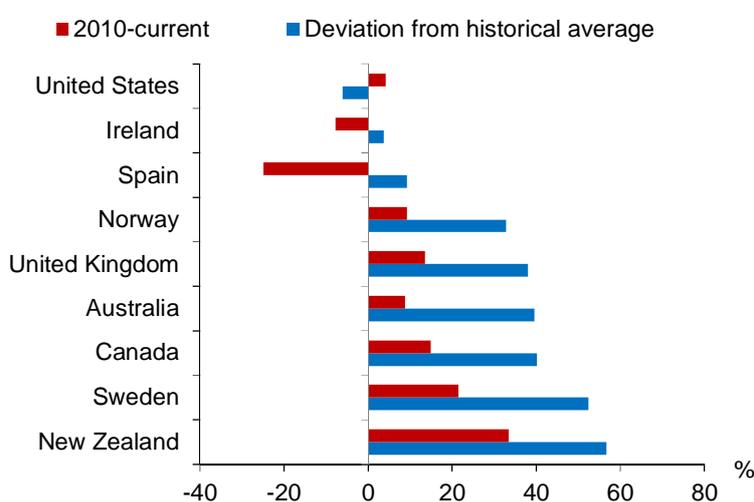
Source: Jorda et al, 2015.

Note: A 'bubble' is defined as a period where house prices grow above their long-term trend, and there is an eventual price correction. 'High' credit refers to episodes where credit growth is above average.

New Zealand house prices have increased by around 50 percent since 2010, driven by strong immigration, low mortgage rates and sluggish housing supply. Average house prices in New Zealand are now around 6.5 times average household income. When combined with the pre-existing imbalance built up prior to the GFC, the house price-to-income ratio is further from its historical average than in almost any other OECD country (figure 2). With house prices becoming increasingly disconnected from underlying household incomes and rents, there is significant potential for house prices to fall very rapidly. A correction in house prices in New Zealand could be prompted by a range of potential shocks to the economy or financial system, including a period of rising unemployment, falling national income or sharply rising lending rates. A withdrawal of speculative interest in residential property or decline in migration inflows would accentuate any such fall.

Figure 2

House price-to-income ratios in selected economies

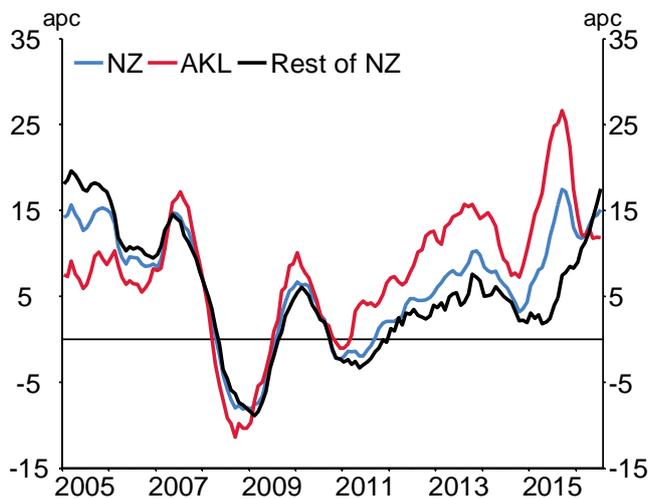


Source: OECD.

Note: Data as of 2016Q1 or latest available. Historical average is computed by OECD and covers either the period since 1980 or the longest time series available.

Recent housing market data suggests that house price inflation is currently increasing rapidly across most of the country (figure 3). Risks remain most acute in Auckland, following a sustained period of rapid house price inflation since 2012. The ratio of Auckland house prices to average regional income has reached around 9 to 10 depending on the particular methodology applied. This is very elevated on a cross-country basis, and similar to major global cities such as London, San Francisco, and Sydney. Following several years of house prices tracking broadly in line with household incomes, annual house price inflation in the rest of New Zealand has increased substantially over the past year to around 17.5 percent. This has seen the house price-to-income ratio return to around its pre-GFC peak.

Figure 3  
House price inflation  
(annual percent change, 3 month average)



Source: REINZ.

There is a risk that current strong rates of house price inflation continue, given recent falls in mortgage rates, market forecasts that interest rates will remain low for some time, high net immigration, and low secondary market inventories. Although house prices are currently less stretched outside of Auckland, the risk of a price correction could quickly become significant as there is less evidence of a fundamental shortage of housing. Ex-Auckland areas with rising populations, such as the Bay of Plenty, are already seeing a proportionately larger supply response. Rising supply should help take pressure off prices, but could also increase the risk that an oversupply of housing emerges. Regional evidence from the United States during the GFC suggests that a region need not necessarily reach a high price-to-income to experience a housing bust, especially if building activity rises sharply during the boom (Haughwout et al (2013)).

There is a range of reasons that banks may not take adequate account of the systemic risks posed by these boom and bust cycles in mortgage debt and house price inflation. During periods of strong house price inflation, banks face strong competitive pressures to lend increasing debt amounts to customers. The risks associated with higher debt can be under-estimated by both banks and customers during these periods, as favourable macroeconomic and financial conditions make loans seem safer. Even if credit origination standards adequately account for the implications of rising debt levels on each banks' individual credit risk, banks are unlikely to adequately account for the macroeconomic effects of their lending decisions. As discussed below, higher debt levels can significantly amplify the effect of a severe housing downturn by leading to a larger reduction in consumption and a sharper increase in house listings.

Stress tests can provide some insights into the ability of banks to cope with a severe downturn in the housing market. There are, however, inherent uncertainties involved in projecting the impact of tail risk events, especially in New Zealand where there has been an absence of a severe downturn for many decades. Another limitation of the stress tests is that they are produced by individual banks, and therefore do not explicitly account for potential feedback effects from the actions of individual banks on the financial system. Banks remaining solvent during a stress test does not imply that there is no role for macro-prudential policy, which aims to limit extremes in the credit cycle and ensure that the financial system is able to maintain lending during severe downturns.

The Reserve Bank has conducted several stress tests in recent years, in conjunction with the Australian Prudential Regulatory Authority. The stress scenarios for these tests tend to assume a severe macroeconomic downturn featuring sharp falls in house prices (and other property values) of around 40-50 percent and large increases in unemployment to around 10 percent. Given the strong profitability of the banking system, recent stress test results suggest that bank capital ratios would remain well above regulatory minima under these stress scenarios. However, the results also imply that the financial system would be far from fully functioning, with potentially large costs for the wider economy (RBNZ (2016)):

- Banks report significant reductions in mortgage credit exposures. For example, banks assumed reductions in mortgage credit exposures of approximately 10 percent in the 2015 common scenario ICAAP test. This would tend to exacerbate the downturn in the housing market by making it more difficult for prospective house buyers to access credit. In addition, credit availability for other sectors also tightens markedly, which is likely to further reinforce the economic downturn.
- At the same time, the number of distressed sales is likely to be rising very sharply. For example, banks reported a cumulative default rate of 12 percent during the 2014 stress test. Under plausible assumptions for loan sizes of defaulted loans and eventual cure rates, this implies around 45,000-75,000 forced sales throughout a stress period. This is a significant amount compared to the likely volume of voluntary sales during a severe downturn. For example, sales volumes fell to around 66,000 per annum following the relatively mild post-GFC slowdown.
- In addition, a significant share of households would be in a position of negative equity, leading to reduced labour market mobility and significant credit constraints. Rising defaults and increasing numbers of households in negative equity would lead to further spillovers on economic activity and extend the housing downturn.

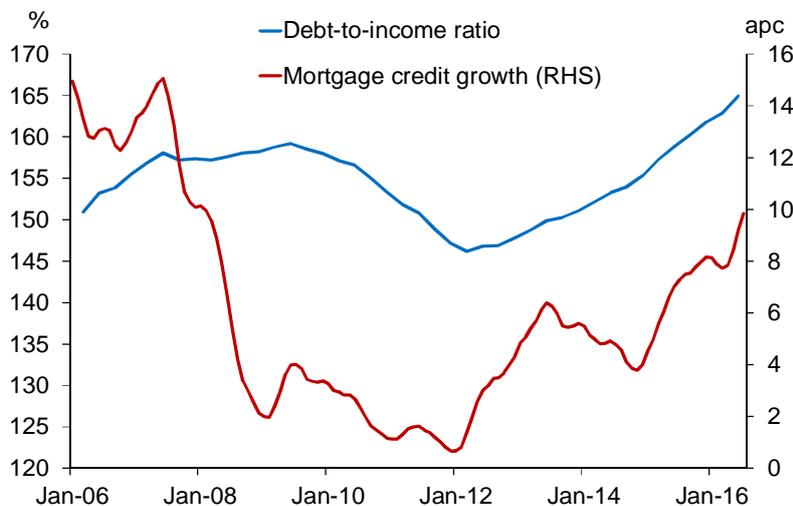
For these reasons, the Reserve Bank does not believe that recent stress test results indicate that there is no role for macro-prudential policy in mitigating financial system risks associated with the housing market.

The pre-existing loan-to-value ratio policy is aimed at reducing the vulnerability of the financial system to a severe housing downturn, by increasing the equity buffers of households. Under the conservative

assumption that the share of high-LVR loans would have otherwise remained constant, around \$20 billion in lending at an LVR of above 80 has not taken place as a result of the policy. In addition, around \$3 billion of investor lending at an LVR of above 70 has not taken place due to changes made in late 2015. New mortgage lending is therefore less likely to reach a point of negative equity that might require the household to sell property if they are unable to service the loan. The policy also appears to have had a temporary impact in leaning against increases in house prices and credit growth.<sup>1</sup> In combination these effects have reduced the risk and potential scale of a severe housing downturn.

Despite the financial stability benefit imparted by the current LVR policy, there is evidence that the housing market continues to pose increasing risks to the financial system. The aggregate household debt-to-income (DTI) ratio has now reached 165 percent, slightly above its pre-crisis peak, and is coming under further upward pressure with mortgage debt increasing by around 10 percent over the past year (figure 4). Given current projections of income growth and house price inflation, the aggregate DTI is expected to continue rising. These unprecedented levels of household debt would tend to magnify the impact of a severe housing downturn on the financial system and wider economy, as indebted households are forced to sharply reduce their consumption or sell property.

Figure 4  
Household debt-to-income ratio and mortgage credit growth



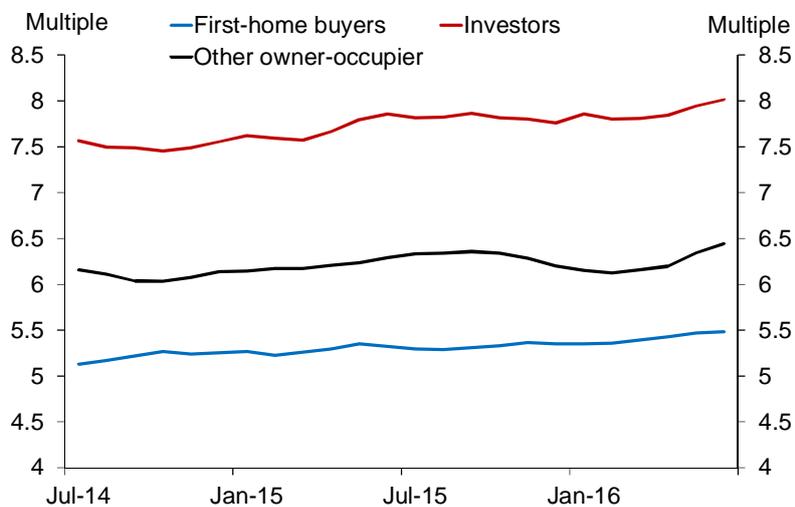
Source: RBNZ *Household Assets and Liabilities*, RBNZ *Standard Statistical Return*.

<sup>1</sup> This is based on the counter-factual estimates in Price (2014) of 4 percent, and an assessment of the counter-factual impact of the 2015 changes using a similar framework.

Typical DTI ratios on new lending are significantly higher than suggested by the aggregate figure. Anecdotal evidence and household survey data suggests that the availability of high-DTI loans increased after around 2010, after falling sharply in the wake of the GFC.<sup>2</sup> Experimental data provided by banks suggests that the share of high-DTI loans has trended up further for all buyer types since 2014, consistent with sharp increases in house prices and falling rental yields (figure 5). The mean DTI for a first-home buyer in the top half of the distribution has increased from 5 to 5.5, while the same figure for investors has increased from 7.5 to 8. Although low interest rates are currently supporting loan servicing ability, elevated debt ratios leave borrowers more vulnerable to any future rise in lending rates or deterioration in economic conditions.

Figure 5

Mean above median debt-to-income ratios on new mortgage lending



Source: Experimental DTI data from major banks.

Investor lending has been a significant component of recent mortgage credit growth, rising from around 28 to 36 percent of overall mortgage lending over the past eighteen months (figure 6). This suggests that the share of investor loans on bank balance sheets has increased significantly, especially given that more than half of investor loans have been on interest-only terms in recent months. Despite tighter LVR restrictions, the investor share of sales has increased in both Auckland and the rest of New Zealand. This is likely to partly reflect the fact that many Auckland investors have been able to increase borrowing capacity by revaluing their existing properties.

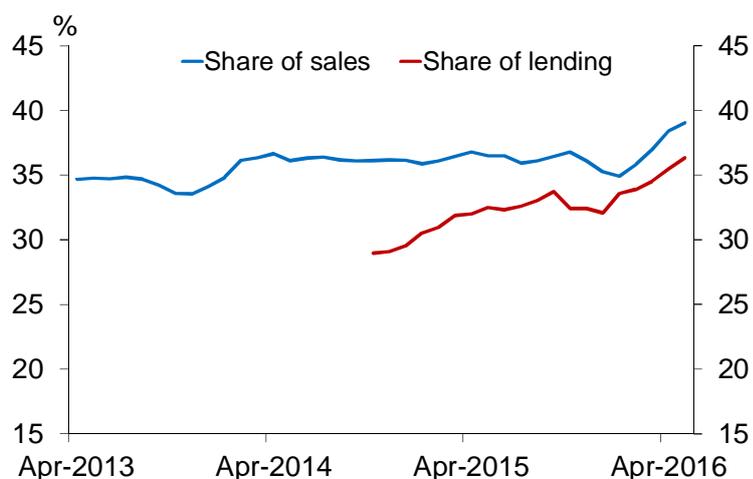
The potential for rising investor defaults pose significant risks to the financial system, with a growing body of international evidence suggesting that loss rates on investor lending are significantly higher than owner-occupiers during severe housing downturns. There are caveats to applying evidence from other

<sup>2</sup> See Dunstan A and H Skilling (2015) "Vulnerability of new mortgage borrowers prior to the introduction of the LVR speed limit: Insights from the Household Economic Survey", AN2015/02.

economies to New Zealand, including that mortgage origination standards can vary significantly across countries and time. These problems are somewhat mitigated by focussing on the differential between default rates for investors and owner-occupiers identified in international studies. Moreover, the tendency for higher investor default rates is consistent with a range of structural characteristics of investor loans in New Zealand discussed below. Direct evidence for New Zealand or Australia is limited as there has not been a severe housing downturn for many decades.<sup>3</sup>

Figure 6

Investor share of housing purchases and lending



Source: CoreLogic NZ, RBNZ *New Residential Mortgage Commitments*.

Note: The definition of investor is somewhat different for purchases and lending. Investor purchases captures all purchases by multiple property owners, while investor lending captures all lending for the purpose of building or purchasing investment property.

Detailed studies of the post-GFC experiences of Ireland (Kelly (2014)) and the UK (McCann (2014)) have found significantly higher default rates on loans to investors than owner-occupiers. This differential remains significant even after controlling for other relevant characteristics, such as LVR, loan vintage, and regional unemployment.<sup>4</sup> The Central Bank of Ireland (2014) and the UK Treasury (HMT (2015)) have drawn the same conclusion from these studies. The Basel committee has also recently proposed significantly higher risk weights for loans where repayment is materially dependent on the cash flow generated by the secured property (BIS (2015)).

<sup>3</sup> Fitch Ratings (2012) has reported on empirical work using data from securitised mortgages in Australia, which suggests that investor loans performed similarly to owner occupier loans in normal times but significantly worse in business cycle downturns. Rating agency models of residential mortgage default also tend to treat investor loans as riskier at any given LVR.

<sup>4</sup> The findings of the literature on commercial property defaults are also relevant for investors with a large portfolio of residential property. An et al (2013) and Moodys (2013) find that defaults for commercial property borrowers rise sharply once the loan is in a position of negative equity.

Higher investor default rates partly reflect a greater incentive to default strategically than owner occupiers. Strategic defaults are defaults where the borrower has the ability to service the loan, but chooses not to because they are in negative equity. When house prices fall substantially, the size of the negative equity facing investors that own a lot of property (e.g. 5 houses) is much larger relative to their future labour income than it is for an owner occupier. Even if they face bankruptcy and losing their own home, default allows the investors to avoid servicing underwater mortgages with that future labour income indefinitely. In contrast, empirical evidence suggests owner-occupiers will tend to continue servicing loans if they can, in order to avoid losing their own home (Gerardi et al (2015)).

Compared to an owner-occupier loan, the income used to service an investment loan is also likely to be more correlated with the value of the underlying security. A sharp fall in house prices will often occur alongside a rise in vacancy rates in an area (for example, due to a rise in unemployment or outward migration). This will make loan servicing more difficult, particularly for investors that have very little free cash flow. Investors have significantly higher DTIs than other borrower types, with around 20 percent of investor lending recently originated at very elevated debt-to-income ratios of above 7. Although investors tend to have more free cash flow than owner-occupiers at a given DTI, this figure suggests that many investors could struggle to service loans in the event of a sustained fall in rental income.

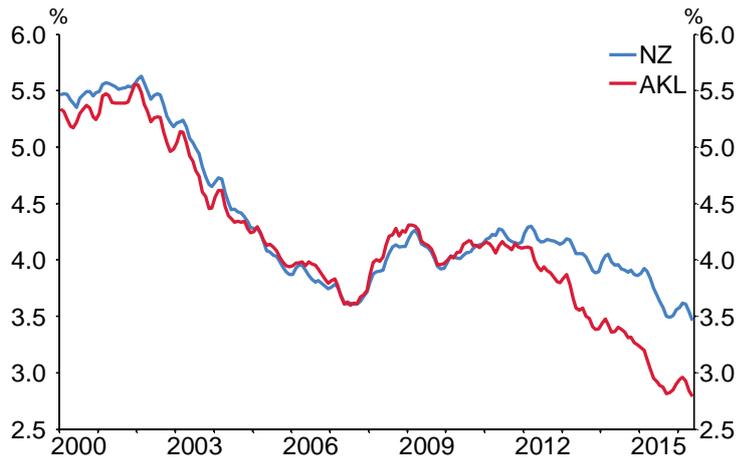
In addition to placing banks directly under pressure through mortgage losses, rising investor default rates are likely to amplify a downturn in the housing market. Because investors are not occupying the homes they are renting (and thus do not have to move as a result of selling the property), they are more likely to respond to a changing view of the market by selling. Given that most investors own multiple properties, a typical investor going into default also results in a much larger increase in distressed sales than for owner-occupiers. As discussed above, rising distressed sales could reinforce the downturn in housing market, increasing the risk of a prolonged period of debt overhang that extends the duration of the downturn in economic activity.

There is added risk associated with investor lending in the current market environment. With the potential size of a house price correction likely to be increasing, lower LVRs may be required to maintain bank balance sheet resilience. Rising property values are also enabling many investors to take on more debt, at the same time as rental yields have declined sharply. Rental yields have declined to historic lows, particularly in Auckland, suggesting that many investors are primarily purchasing for capital gain (figure 7). Falling rental yields imply that investors looking to purchase additional property will have less free cash flow for a given LVR.

Investor lending can also be a strong driver of speculative rises in property markets, as the US and Irish experience indicates. Coates et al (2015) document a strong rise in investor activity in Ireland during the period of rapid house price appreciation up to 2007. Gao et al (2016) investigate the role of investors in

the boom and bust in US house prices surrounding the GFC. Disaggregated regions with a greater share of purchases by investors during the boom experienced more pronounced price contractions in the wake of the GFC.

Figure 7  
Imputed rental yields



Source: REINZ, CoreLogic NZ, MBIE.

Note: Average rents divided by average house prices. This is likely to understate actual rental yields as investment properties have a lower than average value.

## OPTIONS ANALYSIS

The MoU on macro-prudential policy specifies a range of possible macro-prudential tools that could be implemented or varied in order to mitigate rising financial stability risks associated with the housing market. These tools aim to enhance financial stability by building additional buffers in the financial system and/or dampening the economic impact of extremes in the housing credit cycle. Three broad areas of macro-prudential policy options were considered by the Reserve Bank as a policy response to the rising financial stability risks posed by the housing market: adjustments to the LVR policy, restrictions on high-DTI lending, or larger capital buffers on residential mortgage lending by banks. Below we discuss how these options could contribute to the objectives of macro-prudential policy, and the rationale for the Reserve Bank's decision to consider adjustments to the LVR regime in more detail.

It is important to note that the broader prudential framework and monetary policy settings, both within the remit of the Reserve Bank, also have implications for risks associated with the housing market:

- The Reserve Bank already reviewed its permanent risk weight settings for housing in 2013 and 2015 to ensure that the increase in housing risks did not reflect a miscalibration of prudential

capital requirements. These reviews resulted in a tightening of prudential risk weights for mortgage loans. As discussed below, the Reserve Bank is also currently reviewing permanent capital settings for registered banks.

- Low interest rates are one factor underlying rapid growth in house prices and growing household indebtedness. However, the primary objective of monetary policy is to maintain price stability. Although the Policy Targets Agreement states that monetary policy must have regard to financial stability risks, there is little scope for significantly higher interest rates in an environment where headline inflation is currently below the target band.

Rapid growth in house prices fundamentally reflects an imbalance between underlying housing demand and supply, particularly in Auckland. Broader measures are required to reduce these imbalances, with the relevant policy areas extending well beyond financial policy and the responsibilities of the Reserve Bank (Spencer (2016)). While these measures continue to be developed by central and local government, the Reserve Bank's macro-prudential policies are aimed at increasing financial system resilience, and also act to reduce housing demand at the margin.

### **Adjustments to the LVR policy**

The Reserve Bank has had loan-to-value restrictions on bank lending in place since late 2013. As discussed above, this has improved the resilience of bank balance sheets to a housing downturn. With increased equity buffers on new mortgage lending, borrowers are less likely to reach a point of negative equity that might require them to sell property if they are unable to service the loan. In addition, the policy has leaned against the rise in credit and housing demand for a period. Substantial investments have already been made by the banking system to measure high-LVR lending for key classes of residential mortgages, which is expected to limit the timeframes required to implement changes to the policy.

The changes to the LVR policy were driven by two key aspects of the systemic risk assessment:

1. The case for differentiating LVR policy by region has weakened. The Reserve Bank believes that the risk of a sharp fall in house prices is now increasing across most of the country. There has also been a significant increase in investor activity outside Auckland, particularly in nearby regions, which reinforces the case for a nationwide speed limit applying to investors.
2. The case for tighter policy is strongest for investor loans. This reflects (i) increased recognition within the LVR policy of the growing international evidence that bank losses are larger on investor loans during severe downturns (ii) the effect of increased stressed sales among leveraged investors in further depressing property prices, even if the loan does not result in a direct loss for the bank (iii) strong increases in borrowing and purchases by investors, in an environment of falling rental yields. Furthermore, from a wider efficiency perspective, the costs imposed on an

owner-occupier that cannot purchase for a period due to the LVR policy are likely to be greater than for an investor (see below).

As discussed in section 1, it is possible that house prices fall substantially from current levels. As house prices begin to fall, having more property investors with high LVR loans will tend to lead to increased defaults and further supply of properties onto the market, worsening the correction.

### **Debt serviceability policy**

The Reserve Bank believes that new restrictions on the availability of high-DTI lending could complement the current LVR policy by further mitigating housing credit risk. As noted above, both ability to pay and loan-to-value ratio are found to be strong drivers of default in the empirical literature. All else equal, lower DTIs increase the resilience of households to a worsening of economic and financial conditions, thereby reducing the probability that they would need to sell property during a severe downturn. In an environment of falling house prices, this would reduce the risk of a sharp rise in bank losses, and mitigate the amplification of the economic downturn through rising distressed sales of houses and falling consumption among highly indebted households.

By constraining credit availability for some borrowers, a debt serviceability limit could also have some impact in lowering credit demand and house price inflation. Although the size of the impact would depend on the specific calibration of any limit, a potential advantage of a debt serviceability policy is that the borrowing capacity of restricted borrowers would be limited by growth in incomes. In contrast, LVR restrictions may be less binding when house prices are increasing rapidly, since rising equity provides existing owners with scope to periodically increase their loan balance. Incomes may thus be a more effective and enduring anchor for a macro-prudential policy during periods where the house price-to-income ratio is increasing.

The use of DTI restrictions would need to be agreed with the Minister of Finance under the MoU on macro-prudential policy, and would be more complex to implement and monitor than the other macro-prudential options. For example, DTI restrictions would require reliable data on a borrowers' income (a variable which is unlikely to be measured identically by banks) and would ideally be calculated on the basis of the borrowers total debt commitments (thereby requiring banks to measure any debt held at other institutions). The Reserve Bank has confronted some of these issues as part of its experimental DTI data collection, but further work would be required before any debt serviceability limit could be implemented.

The Reserve Bank will investigate the case for a DTI limit in the near future. In addition to monitoring the impact of the revised LVR policy on servicing metrics, the Reserve Bank will begin collecting DTI data from all registered banks, align the definition of investor loans in the collection with the proposed LVR policy, and investigate further measures to standardise the measurement of debt and income across banks.

This improved dataset will enable the Reserve Bank to reach a judgement on whether DTI restrictions are desirable and, if so, how they should be designed.

If the Reserve Bank were to implement a debt serviceability tool in the near future, it would likely be as a complement to LVR restrictions (rather than supplanting them). This reflects the evidence discussed above that both LVR and ability to pay are important determinants of mortgage credit risk. In addition, there is no mechanical link between a borrower's DTI and LVR. A significant proportion of high-TDTI lending is less risky on an LVR metric, and vice versa. At present, there is a significant amount of lending occurring at just below the current LVR limit that looks relatively risky on a DTI metric.

### **Macro-prudential capital overlay**

A macro-prudential overlay on bank capital would build additional loss-bearing capacity in line with rising risks around the housing market, which could then be drawn on in a future period of financial stress. The release of macro-prudential capital buffers would lean against the tendency of banks to sharply reduce new lending during downturns, thereby reducing the procyclicality of the financial system. The Reserve Bank is undertaking a fundamental review of prudential capital requirements for registered banks over the next year, and the possibility of introducing macro-prudential capital buffers will be considered as part of this process.

This channel for mitigating the procyclicality of the financial system is distinct from the transmission of LVRs or DTIs. By directly constraining the allocation of credit, LVR and DTI restrictions have a larger impact in dampening the extremes in the financial cycle. Reductions in lending to riskier borrowers can directly mitigate the rise in lending and asset prices during a boom, and limit the increase in borrower defaults during the downturn. In contrast, any effect of higher capital requirements on the allocation of credit during a boom is likely to be quite limited, and operate through a relatively small increase in lending rates (see RBNZ (2013)). The improvement in financial stability operates by making lending policies less procyclical, rather than limiting the vulnerability of borrowers to a downturn.

### **Summary**

The conclusion of the options analysis was to consider tightening of LVRs for investor loans, while also reducing the complexity of the previous LVR policy. The conclusion to focus on this option in the near-term was partly driven by the rapidly increasing over-valuation of the housing market and growing exposure of the banking system to investors. In addition, the timeframes for implementing LVR adjustments were judged to be shorter than for other tools, as banks are already able to track and control flows of high-LVR loans.

Although a debt serviceability tool or macro-prudential capital overlay have not been implemented immediately, they will be actively investigated in coming months. Any decision to progress with implementation of either of these tools will take into consideration the impact of the revised LVR policy in mitigating risks associated with the housing market. The Reserve Bank will consult on any proposals to implement these tools, including laying out the rationale and expected costs and benefits of regulatory intervention.

Because the alternative policies operate through distinct channels they would largely complement, rather than supplant, the financial stability impact of the LVR policy. In the case of a debt serviceability policy, this complementarity reflects that (i) both LVR and debt serviceability metrics are important determinants of default in empirical studies and (ii) many borrowers are able to achieve significant DTI multiples under a LVR policy. In the case of a capital overlay, complementarity is due to the fact that increased capital would not substitute for the effect of LVRs in directly mitigating the rise in defaults and forced sales during a severe downturn.

## **COST BENEFIT ANALYSIS**

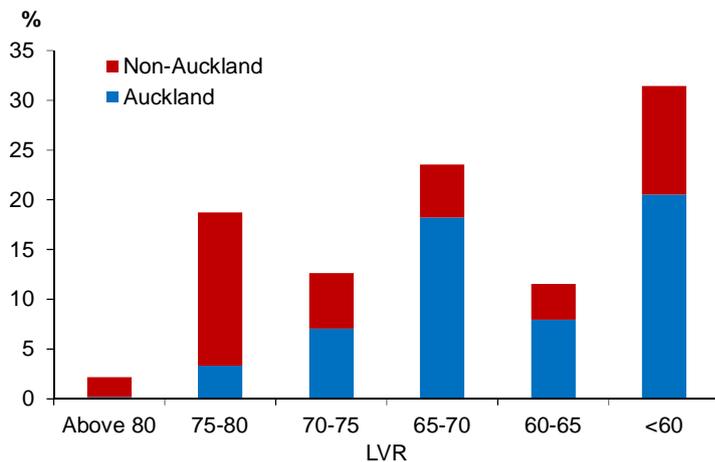
Based on the systemic risk assessment and options analysis discussed above, the Reserve Bank investigated possible calibrations of an amended LVR policy with nationwide speed limits for owner-occupier and investor lending. A range of settings for the nationwide investor speed limit were considered. Ultimately a limit applying at an LVR of 60 was decided upon, and the remainder of this section focusses on a cost benefit analysis of this policy relative to the status quo. This judgement balanced the financial stability benefits from a tighter investor speed limit against the possible unintended consequences and efficiency costs:

- A limit applied at a higher LVR (say 70) would achieve some reduction in risks associated with investor loans, potentially at a lower efficiency cost. However, previous experience suggested that new investor lending was likely to bunch at just below any LVR limit, which suggested that a limit of 70 would still result in substantial defaults during a severe housing downturn (which would likely result in house prices falling by more than 30 percent). In addition to potentially increasing bank loan losses, investor loans with an LVR of between 60 and 70 are more likely to amplify any downturn in the housing market through increased stressed sales (see below).
- A limit applied at a lower LVR (say 50) would bring about additional resilience for the financial system to a severe housing downturn. However, this additional resilience was not judged to be sizable enough to justify the increased risks of unintended consequences and significant efficiency costs. The empirical evidence discussed below suggests it would also be more difficult

to argue that the restricted investor loans posed an equivalent credit risk to an owner-occupier loan with an LVR of just below 80.

The Reserve Bank will implement these changes to its LVR policy on 1 October 2016. Based on the current LVR distribution, the proposed nationwide investor speed limit would potentially affect around 70 percent of investor lending (figure 8). The potentially restricted lending would be split roughly evenly between Auckland investors (primarily currently borrowing at an LVR of 60-70 percent) and non-Auckland investors (primarily currently borrowing at an LVR of 70-80 percent). The changes are also expected to restrict an additional 5 percent of non-Auckland owner-occupier lending (2 percent of overall lending).

Figure 8  
Distribution of investor lending by LVR  
(November 2015- April 2016)



Source: RBNZ *Residential New Mortgage Commitments Survey*.

Table 1 summarises the principal costs and benefits of the LVR policy changes relative to status quo policy settings. The primary benefit of the policy change is to further reduce the risk and severity of a future housing market crisis, in response to signs that systemic housing risks are growing under status quo policy settings. A secondary benefit of the policy is to simplify the existing LVR policy. There are also costs associated with the policy, including systems changes for banks, any costs arising from delayed housing purchases for some buyers, and increased risks of a growing share of high-LVR lending financed by non-banks.

Table 1

Summary of the principal costs and benefits of the proposed LVR policy

Benefits		Comment	Costs		Comment
<b>A) Reduced risk and severity of future housing market crisis</b>			<b>C) Distortionary impacts on housing market</b>		
A1) Reduce bank downturn loss rates over time.	There is evidence that investors have higher default rates than owner-occupiers.		C1) Unintended impacts on rents or supply of housing.	Effect on rents expected to be small, and construction lending is exempt.	
A2) Dampen house price inflation in first year of implementation.	Longevity of this impact could decline if underlying house price inflation remains elevated.		C2) Some buyers may need to delay housing purchases. Any effect concentrated among investors.	Efficiency costs for investors delaying purchases lower than for owner-occupiers.	
A3) Reduce amplification of a housing downturn from distressed investor sales.	Share of investor loans on bank balance sheets is increasing.				
<b>Other benefits</b>			<b>Other costs</b>		
B) Simplify existing LVR policy, removing regional boundary effects.	Higher risks around Auckland housing market, but rest of NZ is expanding fast.		D) Changes required to bank systems and processes.	Expected to be smaller than for previous LVR changes.	
			E) Increased risk that non-regulated institutions engage in a material amount of high-LVR lending.	Little sign of material growth in non-bank lending in response to current LVR policy.	

### **A) Reduced risk and severity of future housing market crisis**

There are a range of possible responses by investors that have their borrowing capacity reduced by the revised LVR limit. Some affected investors may decide to delay purchasing rental property until they are able to accumulate a larger deposit. Other investors may continue transacting at a lower LVR by:

- leveraging owner-occupied properties using the combined collateral exemption
- leveraging property that was previously held outside of the collateral pool
- shifting to purchasing lower value property, e.g. an apartment rather than a standalone house
- more actively revaluing existing properties, especially in an environment of rapid house price increases

The imposition of the Auckland investor limit in 2015 appears to have resulted in a material decline in average LVRs without any significant decline in investor purchases. This suggests that many affected investors were able to continue transacting at a lower LVR, or different investors with more equity replaced those constrained by the LVR rules. The latest policy change is expected to result in a greater proportion of affected investors choosing not to (or being unable to) transact. This reflects the larger increase in required deposit for restricted investors, and that some Auckland investors may have used more of their capacity to make purchases in the last 12 months.

The proposed LVR limit is expected to result in a significant reduction in average LVR and improved servicing ability for investors seeking new lending (table 2). The modelled impacts are as follows:

- The proportion of new investor lending with an LVR of above 60 is expected to fall to around 10-15 percent. The remaining lending at above 60 reflects expected use of the combined collateral exemption to get higher leverage on owner occupied properties that are in a collateral pool alongside investor properties. The use of the combined collateral exemption has been modelled off the experience with the 2015 Auckland investor limit, with an allowance for the fact that non-Auckland investment properties can no longer be leveraged at 80 percent.
- The average LVR for new investor loans in the top half of the LVR distribution (mean above median LVR) would be expected to fall from around 73 percent to just below 60 percent. This estimate has also been informed from the experience with the Auckland investor limit, drawing on the use of the combined collateral exemption and the amount of lending that shifted from an LVR of just below 70.
- The lower LVRs would also generate a significant improvement in servicing ability for investor lending. For example, the rental interest coverage ratio (ratio of rental income to interest payments) would increase from around 90 percent to just above 120 percent. This estimate is based on a rental yield of 6 percent, expenses equal to 25 percent of rental income, and a mortgage rate of 6.5 percent.

Table 2

Distribution of investor lending under proposed policy

	May 2015	Previous regional policy	Adjusted LVR policy
% of loans with LVR > 70	50	33	
% of loans with LVR > 60	73	68	10-15*
Mean above median (MAM) LVR	77	73	58*
Rental interest coverage ratio at MAM LVR	90	95	120*

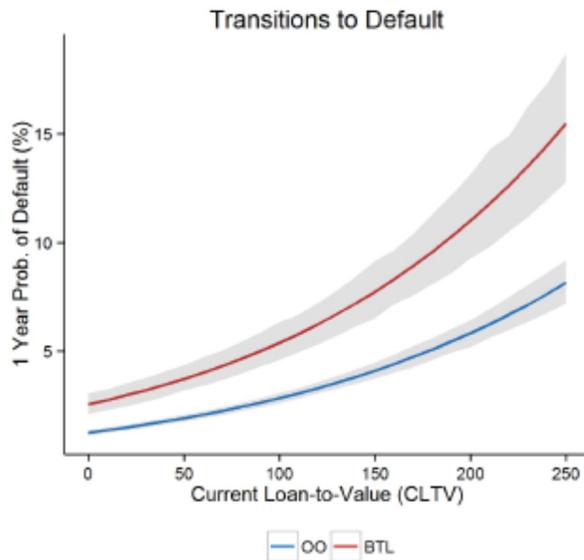
Note: MAM refers to the average value in the top half of the distribution. \* indicates a projection under proposed new limits. Rental interest coverage ratio is the ratio of rental income to total mortgage payment, and assumes a rental yield of 6 percent, expenses equal to 25 percent of rental income, and an interest rate of 6.5 percent.

The proposed policy is expected to materially lower downturn loss rates over time, and reduce the scope for rising defaults or ‘stressed sales’ to exacerbate falling house prices. As noted above, quantifying this effect is difficult given the absence of a severe housing downturn in New Zealand. To gauge the size of these effects, we (i) used the estimates from table 1 of the effect of the policy change on the distribution of investor loans (ii) applied estimates of the marginal effect of LVR on probability of default in Ireland (which were estimated controlling for regional unemployment, loan vintage and interest rate structure) and (iii) estimated the losses associated with defaulted loans using the LVR of the exposure, stressed to account for a 5 percent transaction cost, a 7.5 percent discount for forced sales, and delays of around 18 months in disposing of the property.

Figure 7 shows the estimated empirical relationship between LVR and probability of default (PD) for investors and owner-occupiers during the GFC in Ireland, which is used in our modelling (Kelly (2014)). This relationship is conditional on an elevated rate of unemployment. The relationship implies that an investor starting the crisis with an LVR of 60 would see their probability of default rise by around 55 percent if house prices fall by 50 percent. Probability of default is higher and rises substantially more if LVR at origination is instead 75 percent, which is similar to the current mean above median LVR on new lending to New Zealand investors. Estimated owner occupier default rates are much lower and rise less in absolute terms as LVRs rise.

Figure 7

Impact of current loan-to-value ratio on probability of default in Ireland



Source: Kelly (2014).

Note: Blue: Owner Occupiers. Red: Buy to let (Investors). Unemployment and loan vintage held constant (14 percent and 2006 respectively).

Based on the Irish evidence, the improvement in investor LVRs shown under the policy would significantly lower downturn loss rates. To estimate the effect on the resilience new investor loans, we have calibrated the improvement in PD for two representative investors with the average LVR below and above the median under the LVR policy and status quo policy settings, in line with table 1.<sup>5</sup> During a scenario where house prices fall by 50 percent and unemployment rises sharply, the default rate is estimated to be around 15 percent lower than under status quo policy settings, and the loss rates is estimated to fall by 35 percent. If investor defaults are less sensitive to LVR than in Ireland, this would directly reduce the PD impact, although loss given default would be similar. The resilience impact of the policy would strengthen over time as lending flows originated under the new policy become a progressively larger share of the stock of investor loans. Turnover rates of investor lending suggest that most of the resilience effect would be in place within 3 years.

Bloor and McDonald (2013) set out a framework for analysing the impact of LVR restrictions on the housing credit cycle. The approach first estimates the reduction in number of purchases by restricted borrowers, and then uses an empirical model to relate this to housing prices, sales and credit. Applying the same general framework to the proposed LVR amendments yields an estimated 5-15 percent reduction

<sup>5</sup> We also applied this approach to estimating the resilience benefit of the current Auckland LVR policy. This gave very similar results to a more complex method that estimated the policy impact by applying the Irish PD equation to the lending in each LVR bucket before and after the policy change.

in house sales, and a 2-5 percent reduction in both house prices and mortgage credit. These effects would be somewhat larger outside of Auckland, reflecting the fact that the previous LVR policy had tighter restrictions on Auckland investor lending.

Although the horizon for these effects is approximately one year, this could vary depending on the underlying rate of house price inflation. Faster house price growth tends to reduce the longevity of the impact of LVRs on borrowing capacity and house prices, particularly when limits are applied to investors. This reflects that investor restrictions are likely to apply mainly to existing owners of property, many of whom may be actively seeking to use any extra borrowing capacity to purchase more property.

Finally, the reduction in probability of default amongst investors in the downturn scenario would directly reduce the number of forced sales during a severe housing downturn. In combination with the small reduction in peak house prices described above, this is expected to reduce the size of the peak to trough decline in house prices. This makes it more likely that the housing market will remain orderly, encouraging lenders to remain active, and giving homeowners more confidence about their financial position. The risk of a protracted “downward spiral” where a growing excess supply of properties on the market push prices down further and thus push more borrowers into financial distress (causing more properties to go on the market) is reduced.

#### **B) Nationwide LVR policy is simpler than alternatives**

The revised LVR policy implements nationwide speed limits for investors and owner occupier classes. This simplifies the current policy which differentiates between Auckland and non-Auckland loans. The revised policy is also much simpler than a possible alternative of expanding the non-Auckland limit into investors and owner-occupiers (4 speed limits in total). Having additional speed limits complicates management for the banks, as they have to track the numerator and denominator for multiple smaller classes of lending, and frontline staff must apply more complicated rules to comply with the policy. Thus, the change to two speed limits should simplify management of the LVR policy for the banks.

There is also some evidence that there were regional boundary effects associated with the previous LVR policy, which will not be present under the revised policy. The presence of Auckland investors in nearby housing markets such as Hamilton and Tauranga grew substantially after the regional LVR policy was implemented in 2015. While this is likely to also reflect that rising Auckland prices have increased equity for these investors, tighter LVR constraints for Auckland investor purchases have increased incentives to purchase outside of Auckland. Rising Auckland investor purchases appear to be a significant factor behind very rapid growth in house prices in Hamilton and Tauranga, although associated risks are mitigated as the properties are likely to be purchased at a higher rental yield than in Auckland.

### **C) Restriction of borrowing capacity for some borrowers**

The LVR policy changes transmit to reduced risk and severity of a future housing downturn by affecting the allocation of mortgage credit to riskier investors. We believe that this is likely to enhance the allocative efficiency of the financial system, given that banks are unlikely to take into account the effect of increased investor lending in amplifying downturns. Nevertheless, the LVR policy will not take into account the full range of special borrower circumstances factored in by banks.

The policy will limit the options for some borrowers who wanted larger mortgages in order to achieve larger portfolios of rental properties. As noted above, the policy will potentially restrict around 70 percent of investor lending. Based on the experience with the Auckland investor limit, a significant proportion of these borrowers will be able to continue to transact at a lower LVR. Restricted investors are unable to achieve a lower LVR will need to either buy less rental property or allocate their money to a different investment. While this affects their portfolio allocation, this does not seem like a particularly large efficiency cost for the financial system as:

- The efficiency costs of having to change investment plans seem likely to be smaller than those associated with an owner-occupier needing to delay purchasing, which could entail delays in entering the housing market or being able to shift cities for a new job;
- It seems unlikely the policy will materially increase rents, as the supply and demand of properties should remain broadly unchanged. Some of the houses that would have been sold to high LVR investors will be sold to investors with lower LVRs. The policy will probably also lead to higher rates of purchase by owner occupiers, but that should reduce both demand and supply of rental properties.
- It is common for governments (in NZ and abroad) to provide assistance to people seeking to buy owner occupied property such as the Homestart program in New Zealand. This suggests that distorting market outcomes towards encouraging owner occupation (as above) can be seen as having desirable consequences.
- There are some tax advantages to holding rental property relative to other assets, so to some degree the LVR policy may lean against existing distortions that encourage investment in rental property.

### **D) Administrative costs of changes for banks**

The Reserve Bank has had loan-to-value restrictions on bank lending in place since late 2013, and substantial investments have already been made by the banking system to measure high-LVR lending for key classes of residential mortgages. This is expected to limit the timeframes required to implement proposed changes to the policy.

Banks have agreed that the costs to implement the LVR policy changes are relatively minor, with estimates of implementation costs ranging from \$1.2 to \$5 million for large banks and \$0.25 to \$0.5 million for small banks. Data systems built for regional LVR restrictions would generally be able to deliver compliance data for the new policy, with some limited system modifications to reclassify property investors that have an Auckland owner-occupied property. Another benefit of the LVR policy change is that compliance data can now be harmonised with capital requirements associated with the creation of the new residential mortgage asset class in 2015. Most costs would revolve around process, policy and communication of changes to the lending staff.

### **E) Possibility of disintermediation**

There is a risk that the revised restrictions on high-LVR bank lending result in an increase in high-LVR lending by non-banks. The Reserve Bank believes this would result in a decrease in financial system stability, as growing lending outside of the banking sector would undermine the benefits of the policy in limiting the rise in house prices and household indebtedness. In addition, disintermediation could possibly reduce the dynamic efficiency of the financial system, as any non-bank lenders would likely have more costly and less comprehensive processes for mortgage origination.

To date, there has been very little evidence of growing high-LVR lending outside the banking system. The incentives for non-banks to enter the market are limited by the temporary nature of the LVR policy, and the fact that banks have a speed limit of high-LVR loans available. In addition, non-bank lenders are a very small component of the financial system, with the non-bank deposit taking sector in particular having declined substantially since the Global Financial Crisis. However, the risk of a material increase in non-bank high-LVR lending is likely to increase under the proposed restrictions, which could potentially constrain a large part of the market for bank investor loans.

The Reserve Bank will continue to monitor for any signs that a substantially higher share of properties are being financed outside of the banking system, and this will be a factor when considering whether to maintain the restrictions. The amount of mortgages financed by non-bank institutions will be monitored using data on mortgage registrations sourced from property titles. In line with the spirit clause of BS19, banks should not fund the activities of non-banks that are making loans that would be treated as high-LVR if made by a bank.

## **IMPLEMENTATION, MONITORING AND REVIEW**

The Reserve Bank has consulted the Minister of Finance on our proposed approach, including discussions with the Treasury. We have also consulted the public, and had a series of exchanges with affected banks (including a policy workshop, a number of meetings and conference calls, and an additional exchange of letters). The summary of submissions summarises that feedback and the changes that are being made to our initial proposal based on that feedback, which included a one month delay to the implementation date and a broadening of the existing exemption for construction lending.

Registered banks appear to have acted quickly to comply with the spirit of the revised policy by tightening their origination policies. Registered banks will receive two weeks' formal notice of the decision to introduce revised LVR restrictions, which will be implemented via banks' conditions of registration (with technical aspects set out in the Banking Supervision Handbook document BS19). Banks will have the opportunity to comment on new conditions (and variations to conditions), as required by section 74(3) of the Act. Each bank has to include in every quarterly disclosure statement a statement by its directors on whether or not the bank has complied with its conditions of registration, and this will include the conditions implementing the LVR restrictions.

The adjusted LVR restrictions will continue to be monitored through the Reserve Bank's prudential data collections, and other macroeconomic statistics relating to the housing market and credit. In order to measure the impact of the policy in enhancing financial system resilience, the sort of analysis shown in this RIA will be updated in line with actual lending flows and balance sheet data after the policy is implemented. The Reserve Bank will also monitor any impact of the policy in dampening house price and mortgage credit growth. The impact of the policy will be discussed with other Government agencies with an interest in the housing market (including the Treasury and MBIE).

In line with the MoU on macro-prudential policy, the Reserve Bank will monitor and assess the implications for monetary policy, and explain any implications in its *Monetary Policy Statement*. To the extent that the LVR policy change slows the housing market as modelled, there is likely to be some impact in slowing household consumption. Depending on the durability of any associated reduction in inflation pressures, this might necessitate somewhat lower interest rates than otherwise. Monetary policy is also directed to have regard to financial stability under the latest Policy Targets Agreement. Looser monetary policy settings could increase the potential risk of further fuelling increases in house prices, creating trade-offs between the price stability and financial stability objectives in the current environment. The financial stability risks associated with lower interest rates are partly balanced by the adjustments to the LVR policy (McDermott and Wheeler (2016)).

The LVR policy remains a temporary measure that will be removed at the appropriate time. There is a range of criteria that will guide the removal decision, including that house prices and credit return to a more sustainable path, and that the risk of a resurgence in housing pressures following removal is acceptable. In addition, the Reserve Bank will continue to monitor for signs that the policy is creating significant market distortions, such as a material and growing share of mortgage credit being financed by non-bank institutions that are not subject to the policy.

The Reserve Bank will publically describe its view of the case for maintaining or adjusting LVR restrictions in the *Financial Stability Report* and other periodic communications. Relevant data will also be released periodically in the macro-prudential indicator (MPI) chartpack. The macro-prudential framework will be examined later this year as part of the IMF's Financial System Assessment Programme and, as specified in the MoU, a review of the macro-prudential framework will be undertaken in 2018.

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