



**RESERVE
BANK**

O F N E W Z E A L A N D
T E P Ū T E A M A T U A

Regulatory impact assessment: Restrictions on high-LVR residential mortgage lending

August 2013

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Executive summary

1. The Reserve Bank of New Zealand is concerned that the current escalation of house prices and a rise in residential mortgage lending with high loan-to-value ratios (LVRs), against a backdrop of historically high and rising household indebtedness, are increasing risk in the New Zealand financial system. House prices are currently increasing at a rate of around 9 percent per annum from an historically high base, with the household debt-to-disposable income ratio at 145 percent and rising. These factors increase both the probability and potential impact of a significant downward house price adjustment, which could result from a future economic or financial shock.
2. The Reserve Bank considers that current imbalances in the housing market could increase over time, resulting in a significant, disorderly correction to the financial system in the event of a shock to household incomes or borrowing costs. The recent increase in the share of high-LVR residential mortgage lending is likely to be contributing to house price inflation, and is increasing the potential adverse impact of a fall in house prices on the financial system and the wider economy.
3. The Reserve Bank has been developing a policy approach known internationally as 'macro-prudential policy', which uses prudential instruments, including sectoral capital requirements and restrictions on the LVRs of banks' residential mortgage lending, to dynamically manage financial system risks.¹ In deploying macro-prudential policy instruments, the Reserve Bank's objective would be to promote financial stability by building the resilience of the financial system and dampening excessive growth in credit and asset prices. This helps the Reserve Bank to meet its statutory purpose of promoting the maintenance of a sound and efficient financial system.
4. The Reserve Bank's primary motivation for taking action in the current environment is to dampen house price and credit growth to promote future financial stability. LVR restrictions on residential mortgage lending can help to dampen excessive house price growth arising from growth in bank credit that boosts housing demand beyond housing supply. The application of LVR restrictions is expected to reduce the risk of subsequent economic and financial instability that are often associated with rapid corrections in house prices. The Reserve Bank therefore considers that LVR restrictions would be the most effective way to achieve this dampening of house price inflation.
5. As a result, the Reserve Bank intends to put in place restrictions on banks' high-LVR residential mortgage lending. It intends to take this action at this stage in the housing cycle, to limit the on-going accumulation of this type of lending, and the risks that it creates for future financial stability. Registered banks will be required to temporarily restrict their new residential mortgage lending at LVRs over 80 percent to 10 percent of total new residential mortgage lending.
6. The new requirements will normally apply to all registered banks in New Zealand, and as such they will be subject to upfront implementation and on-going administrative costs. Some low-equity borrowers will be temporarily prevented from residential-mortgage borrowing, although the effect on any one group of high-LVR borrowers will depend on how banks choose to ration their lending to remain within

¹ The Reserve Bank consulted on its macro-prudential framework in March 2013, and released final policy positions in May 2013. See RBNZ (2013a) and RBNZ (2013c).

the restriction. These requirements will not have any direct effect on low-LVR borrowers.

Regulatory impact assessment

7. This document contains a regulatory impact assessment (RIA) of using LVR restrictions to address housing market imbalances. It focusses on the costs and benefits likely to be associated with these restrictions, and with three alternative policy options considered by the Reserve Bank.
8. The macro-prudential policy approach is new for New Zealand, and experience in the use of these policy instruments and the data required to support them are currently limited. This makes the quantification of costs and benefits difficult, and as such there is a strong element of judgement required in assessing costs and benefits. Any quantification is based on data available to the Reserve Bank as at 15 August 2013. The Reserve Bank is working to improve the quantity and quality of this data, and is taking a keen interest in other countries' experiences in the use of macro-prudential tools.
9. This RIA has been prepared by the Reserve Bank in accordance with the requirements of section 162AB of the Reserve Bank of New Zealand Act 1989 (the Act), which requires the assessment of expected regulatory impacts of policies adopted under Part 5 of the Act.

Structure of the RIA

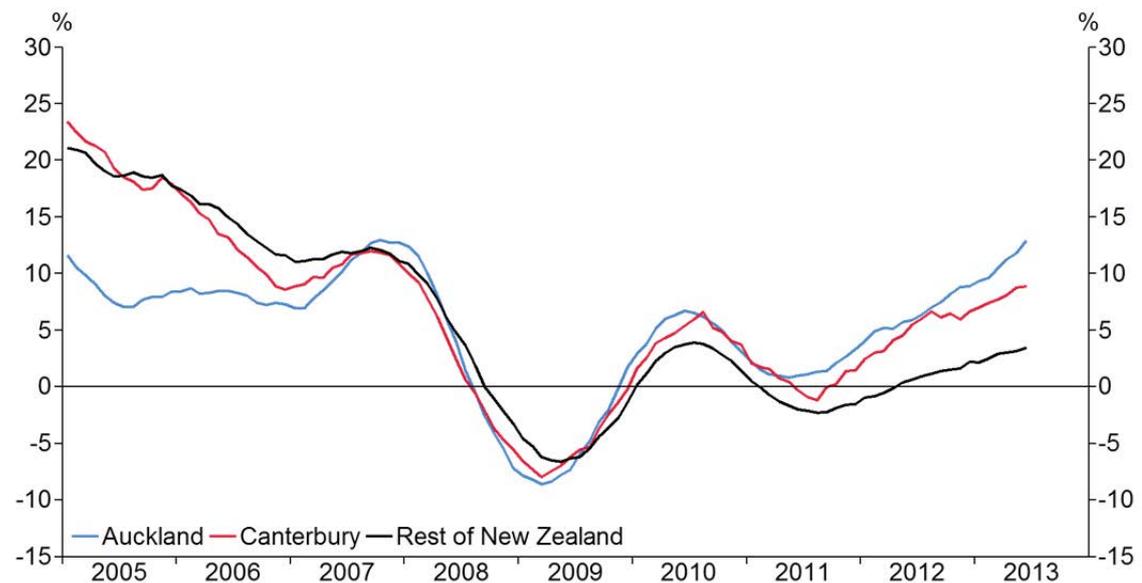
10. This RIA adopts the structure set out in the Treasury's *Regulatory Impact Analysis Handbook*. As such, it contains:
 - i. an identification of the problem, and an overview of the current policy environment;
 - ii. a summary of the objectives and assessment criteria against which the Reserve Bank has assessed various options;
 - iii. a description of the three options considered by the Reserve Bank, and an analysis of the costs and benefits of each option;
 - iv. a summary of the Reserve Bank's macro-prudential decision-making framework, and a conclusion as to the preferred option;
 - v. a summary of the consultation undertaken by the Reserve Bank in respect of the development of a macro-prudential framework, its review of bank capital adequacy requirements for housing loans, and the framework for restricting high-LVR residential mortgage lending;
 - vi. a summary of issues relating to the implementation of the preferred option; and
 - vii. a description of the Reserve Bank's monitoring and evaluation of the implementation of the preferred option.

Problem definition and status quo

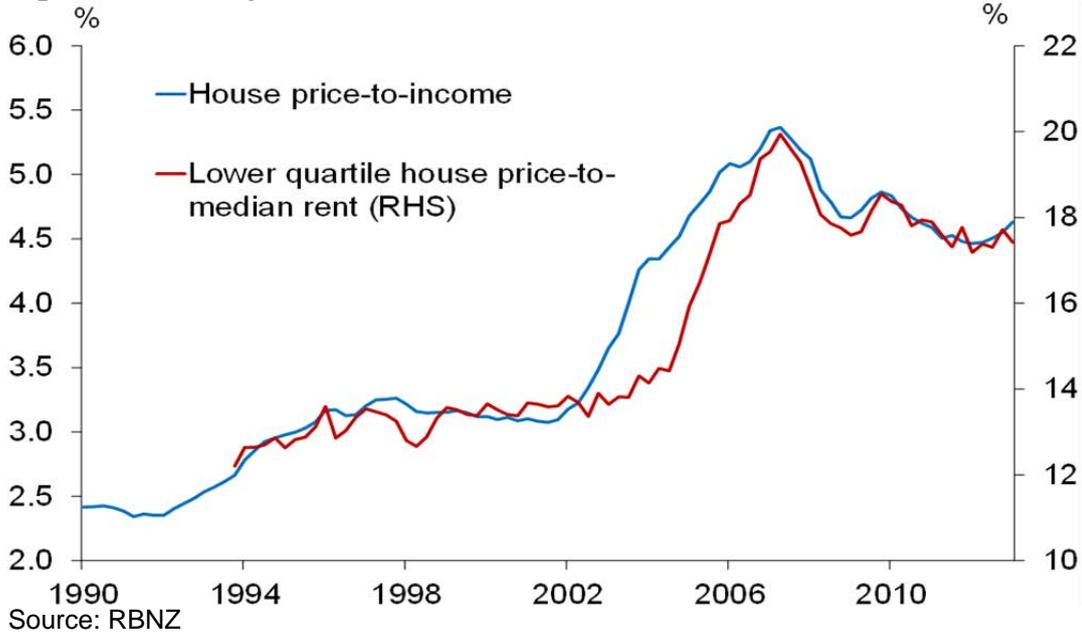
Problem definition

11. House prices, household credit growth, and household debt in New Zealand are increasing. National real house prices have more than doubled over the past two decades, and housing credit has increased from around 0.7 times annual household disposable income to 1.4 times disposable income over the same period.
12. Within these long-term upward trends in house price and credit growth there have been some significant cyclical movements. Household credit growth slowed sharply following the global financial crisis, and house prices fell slightly from the peaks reached in 2007. However, household indebtedness and house prices remain elevated on a number of metrics (both in an historical sense and by international comparison). They have been rising again from these elevated levels over the past 18 months.
13. Nationally, house price inflation has increased to around 9 percent per annum, considerably higher than Consumer Price Index (CPI) inflation at 0.7 percent, with average house prices now around 10 percent above the 2007 peak. Figure 1 shows that this growth is being led by the Auckland and Christchurch housing markets, but house price inflation is also increasing outside these centres, albeit modestly to date.

Figure 1: Regional house price inflation
(Average annual percent change)

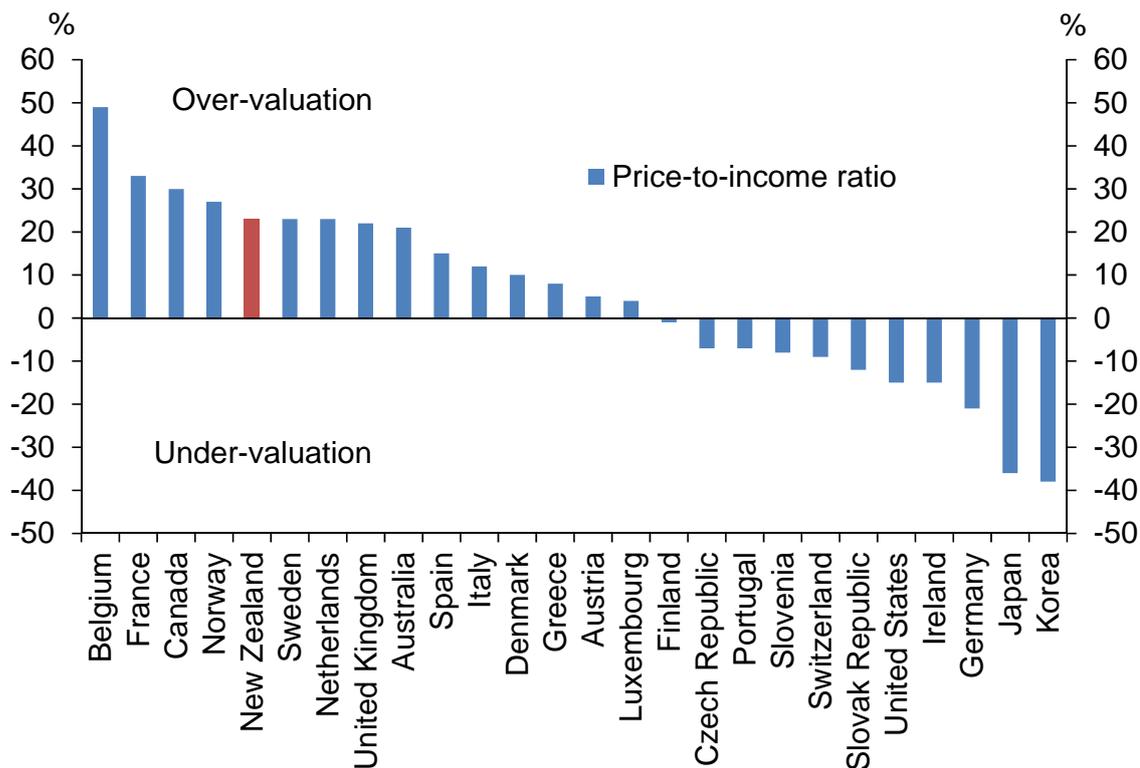


14. As average house prices have increased, measures of housing affordability have deteriorated. Figure 2 shows that house prices are currently significantly higher relative to income and rents than 20 years ago, and are starting to rise again.

Figure 2: House prices relative to measures of fundamentals

15. New Zealand house prices are not just high historically, they also appear high relative to international norms. This finding was noted by the International Monetary Fund (IMF) in its May 2013 “Article IV” assessment of New Zealand. In this report, the IMF indicated that it considered New Zealand house prices to be overvalued by about 25 percent. New Zealand’s median house price-to-income ratio is about 4.5, and approximately 20 percent higher than its average over the last thirty years (IMF, 2013).
16. The OECD has also recently noted New Zealand’s high and rising price-to-rent and price-to-income ratios. It noted that, as a result, the New Zealand economy is vulnerable to the risk of a price correction in the housing market. Figure 3 below compares these measures across countries, and suggests that New Zealand house prices are significantly overvalued compared with those of most other countries.

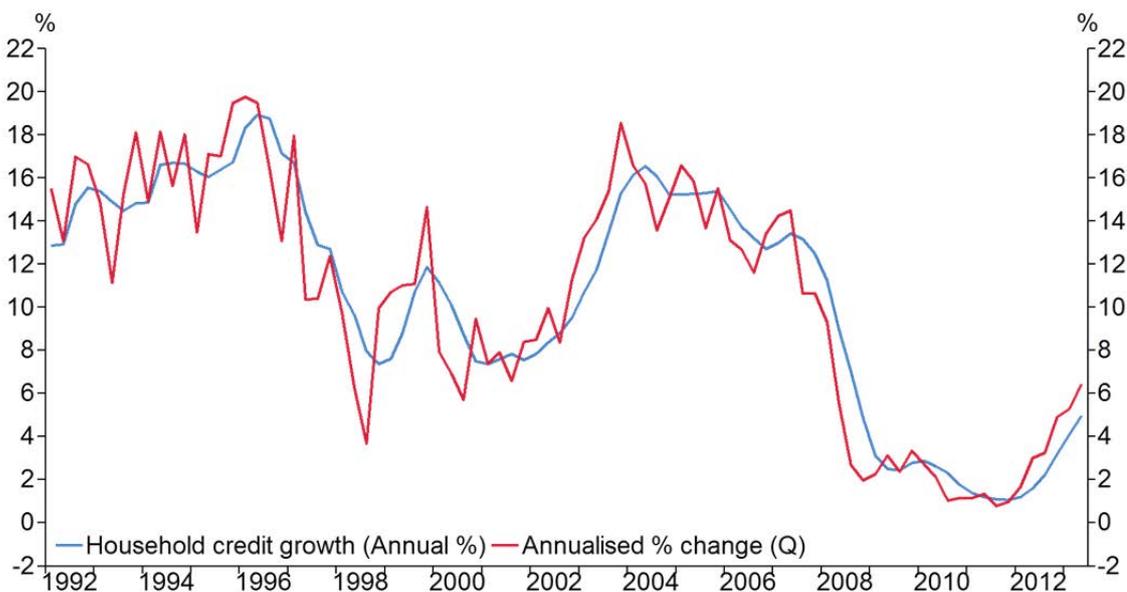
Figure 3: House price to income across OECD countries
(deviations from historical average)



Source: OECD (2013)

17. Rapidly rising house prices over the last two decades have coincided with an expansion in household debt. Household credit growth was very high (16 percent per annum) at the peak of the housing cycle in 2007 (see figure 4), and the household debt-to-disposable income ratio climbed from around 60 percent in 1993 to around 150 percent by the peak.

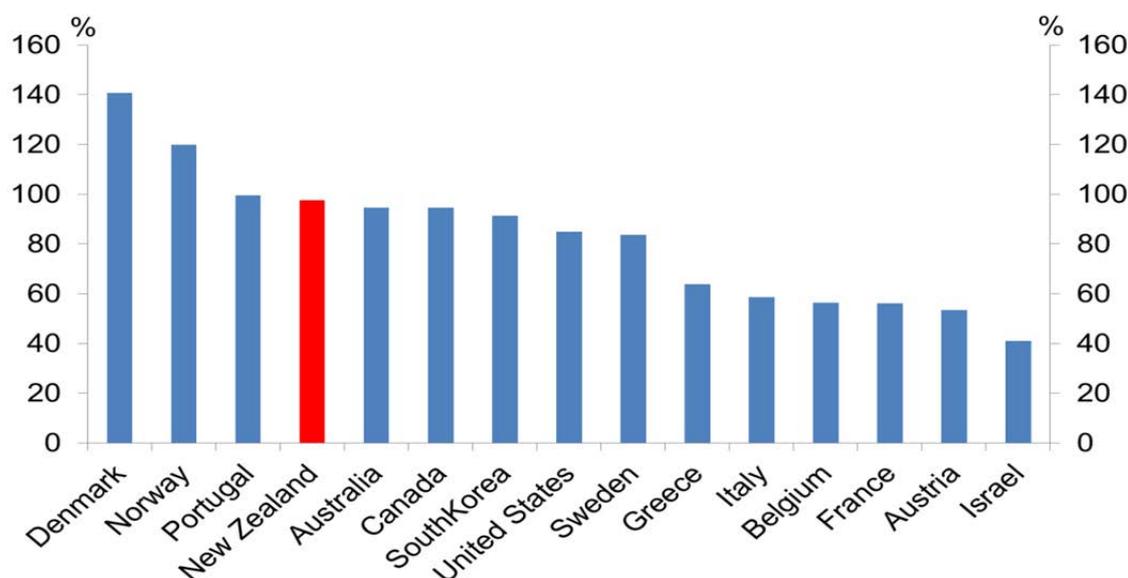
Figure 4: Household credit growth



Source: RBNZ

18. Although in the current housing cycle household credit growth has not yet reached the pace seen during the last cycle, it is on an upward trajectory. Household credit growth has increased to 5.8 percent per annum from around 1 percent throughout 2011, exceeding household income growth.² A number of studies suggest that the probability of a banking crisis increases if fast house price growth is coupled with high credit growth (see, for example, Borio and Drehmann (2009) and Arregui (2013)).
19. Increasing household credit growth has seen an upturn in the household debt-to-disposable income ratio. It is currently at around 145 percent, increasing from 142 percent in mid-2012 despite historically low interest rates. This level of indebtedness is also high internationally. Figure 5 compares the level of household debt to gross domestic product (GDP) between New Zealand and other advanced economies.

Figure 5: Household debt-to-GDP in advanced countries 2012



Source: IMF Financial Soundness Indicator (FSI) database and RBNZ

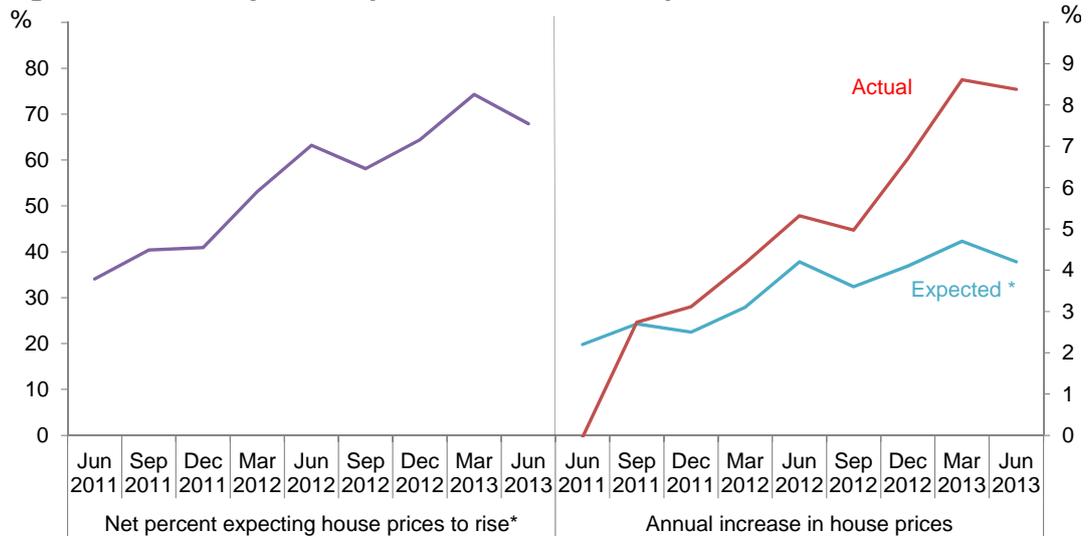
Note: Country selection based on data available from IMF.

20. Overall, the indicators show house prices and household indebtedness are high by both historical and international standards, and are on a renewed upward trend. The Reserve Bank is concerned about this upward trend, and considers that on-going housing market pressures will see prices continue to rise, for a number of reasons:
- i. There is tight housing supply, particularly in the Auckland and Christchurch markets. Rising house prices should encourage an increase in supply, but increasing supply takes time, and is unlikely to have a significant impact on price in the near term.
 - ii. The current low interest rate environment in New Zealand has reduced the cost of servicing household debt. This has increased households' total borrowing capacity and is likely to be providing a further boost to demand for housing, increasing the prices that prospective buyers are willing to pay.

² Credit growth rates are also net of debt repayments, which have been significantly higher in the years since the GFC. The Reserve Bank therefore considers that the strength of housing and credit demand is not fully reflected in the aggregate data. New mortgage approvals and loans have been growing at a faster rate and are now comparable with the pre-GFC peak levels.

- iii. A recent lift in net immigration (with a net inflow of 7,900 permanent long-term migrants over the year to June 2013) is expected to add to housing demand.
- iv. Expectations of better returns to housing are likely to encourage additional households to buy houses, and also attract speculators into the market, further pushing up prices and expectations. Since 2011, the Reserve Bank has collected data on households' house price expectations. Over this period, the net share of households expecting house prices to rise has almost doubled, with around two-thirds of households expecting house prices to rise over the next year (see figure 6 below).

Figure 6: Quarterly house price inflation and expectations 2011-2013



Source: RBNZ

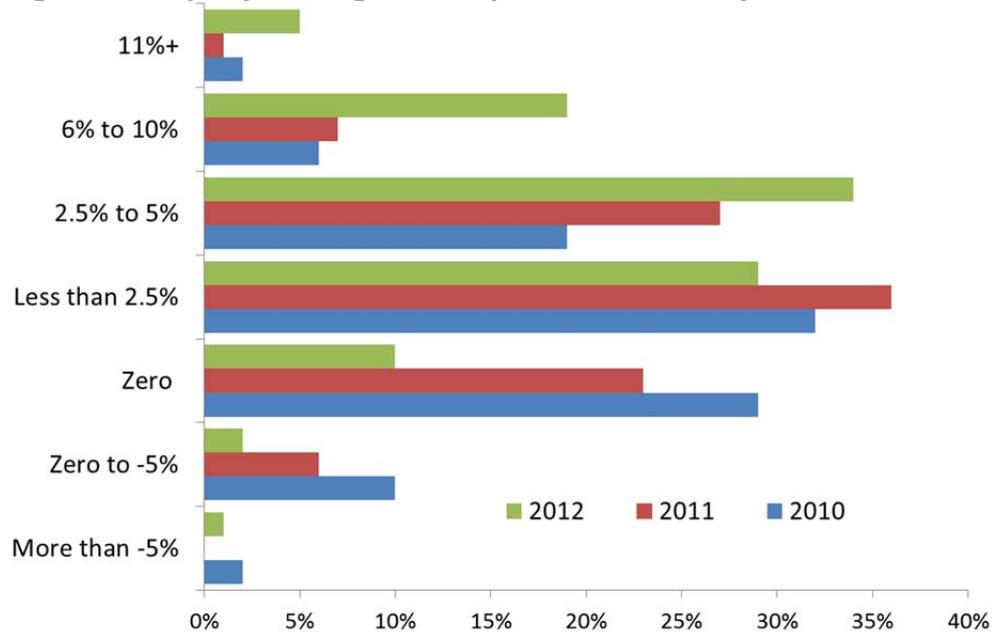
Note: *Expected increase over next 12 months.

Likewise, expected house price inflation has also increased, although not as markedly as actual house price inflation over the same period. Inflated expectations of property price increases can exacerbate house price and credit cycles, by drawing property investors into the market, and setting off a self-fulfilling cycle of house price appreciation leading to further housing demand.

The long-running ASB housing confidence survey, dating back to 1996, shows a similar trend over the past two years. In the three months to July 2013, 62 percent of respondents expected house prices to increase in the next twelve months, with 17 percent expecting the same, and 6 percent expecting prices to fall. As such, expectations of house price increases are above the levels seen prior to the global financial crisis (GFC).

Strengthening house price expectations also appear to be flowing through to investor sentiment. The 2012 ANZ Property Investors Survey found a significant gain in those that expect a capital gain of 6 to 10 percent over the next year - 19 percent of respondents, up from only 7 percent of respondents in 2011 (figure 7). Similarly, an investor confidence survey conducted by ASB reportedly found that 17 percent of respondents viewed rental property as being the asset most likely to provide the best returns.³

³ Although it is early in the cycle, there are indications investors may be responding to these price signals. In the August 2013 BNZ-REINZ Residential Market Survey, a net 21 percent of responding agents reported seeing more investors in the market, above the two year average of a net 16 percent.

Figure 7: Property value growth expectations – next year

Source: ANZ Property Investors Survey 2012

Risk outlook

21. Unchecked, the Reserve Bank expects the factors noted above to lead to further house price increases. This is a cause for concern on both financial stability and macro-economic grounds.
22. From a financial stability perspective, large asset price cycles, and especially real estate price cycles, have the potential to have system-wide impacts when they correct. The more that house prices overshoot their long-run sustainable levels, and fail to represent fundamentals, the greater the likelihood of a significant downward correction endangering systemic stability at some point. Such a correction would be most likely to occur in the context of deterioration in economic conditions involving a marked increase in unemployment and/or a reduction in household incomes. Falling house prices in these circumstances would be likely to lead to an increase in loan default rates. As residential mortgage lending is the largest single exposure of the banking system, increasing loan default rates could be expected to have a large negative impact on banks' willingness to lend.
23. On the macro-economic front, a sustained rise in household borrowing, and rapid increases in house prices, have the potential to fuel growth in domestic demand, with expectations of a tightening in monetary policy putting upward pressure on the exchange rate. Conversely, if house prices fall sharply, particularly in the context of adverse economic conditions, they are likely to have a major dampening effect on economic activity as loan defaults rise and household wealth falls. Economic disruption is likely even in circumstances where the financial system has the capacity to absorb loan losses, due to the damaging effect on household balance sheets.
24. Such economic disruption has been evident in other economies where inflated house prices have corrected abruptly and damagingly. Spain, the United Kingdom, Ireland, and the United States all experienced significant house price appreciation in the decade leading up to the GFC, with house prices rising by more than 50 percent (IMF, 2004). Much of this appreciation, particularly in the United States and Ireland, was due to competition between lenders, and falling lending standards, and by 2006 more than 40 percent of new mortgage lending in the United States had high LVRs.

In Ireland, lending was occurring at LVRs over 100 percent, and house prices had reached levels 20 to 30 percent higher than could be attributed to fundamentals (IMF, 2008).

25. House price appreciation in these countries increased the value of collateral for borrowing, fuelling consumption booms and a further easing of credit conditions. Investment in the housing market became more attractive, leading to an increase in construction activity, particularly in Spain, the United States, and Ireland. When real estate prices began to decline, the over-investment in housing put further downward pressure on house prices; house prices fell by over 40 percent in Ireland (Lydon and McCarthy, 2012).
26. The fall in real estate prices led to heavy losses for lenders, financial distress, tightening credit conditions and the on-going recession. IMF research indicates that recessions that are associated with house price busts tend to be longer and deeper than other recessions, with a greater negative impact on output, investment, and employment (IMF, 2008).
27. Overseas experience has shown that those borrowers with high-LVR residential mortgage loans tend to be more exposed to the risks of a sharp decline in house prices and adverse economic conditions. Lamont and Stein (1999) analyse the housing markets of US cities, and find that cities with a higher share of high-LVR borrowers are more sensitive to city-specific changes in incomes. Almeida et al (2006) show that house prices and new household borrowing are more sensitive to income shocks in countries with higher LVRs. The lower equity in these loans means that, should the borrower get into difficulty, they are likely to have limited ability to sell or refinance their way out of distress.
28. For the lender, low equity means that, should the borrower default, the margin of collateral above the value of the outstanding loan becomes very small or negative. This increases the likelihood of losses to the lender. Reflecting this, high-LVR lending tends to be riskier, with a higher probability of default, higher loss given default and a higher exposure to systemic risk (risk associated with general economic conditions), than other residential mortgage lending.
29. The Reserve Bank's micro-prudential settings address this increased risk by requiring banks to hold more capital against this lending. These requirements are based on a 'through-the-cycle' calibration approach that requires banks to carry broadly the same amount of capital through the economic cycle and ensure capital held is calibrated to normal as well as downturn market conditions.
30. However, there can be circumstances (as happened in many countries before the GFC) in which increasing optimism on the part of lenders, borrowers and financial market participants leads to an under-pricing of risk, an excess of risk taking, and increasingly leveraged household, business and financial sector balance sheets. Existing micro-prudential regulations are limited in their ability to deal with an abrupt change of sentiment as the financial cycle turns, which can see lenders and borrowers become overly cautious, choking off the flow of credit to the economy, and exacerbating the economic downturn.
31. Although there are other factors that can increase systemic risk, such as low debt servicing ability, high-LVR lending can be a significant source of systemic risk, particularly when house prices become increasingly stretched relative to their fundamental economic drivers. The Reserve Bank draws some comfort from its research that suggests that banks' lending to high-LVR borrowers has also tended to be directed towards higher income borrowers (RBNZ, 2011). Nevertheless, this research also indicates that debt servicing ratios are still higher on average amongst

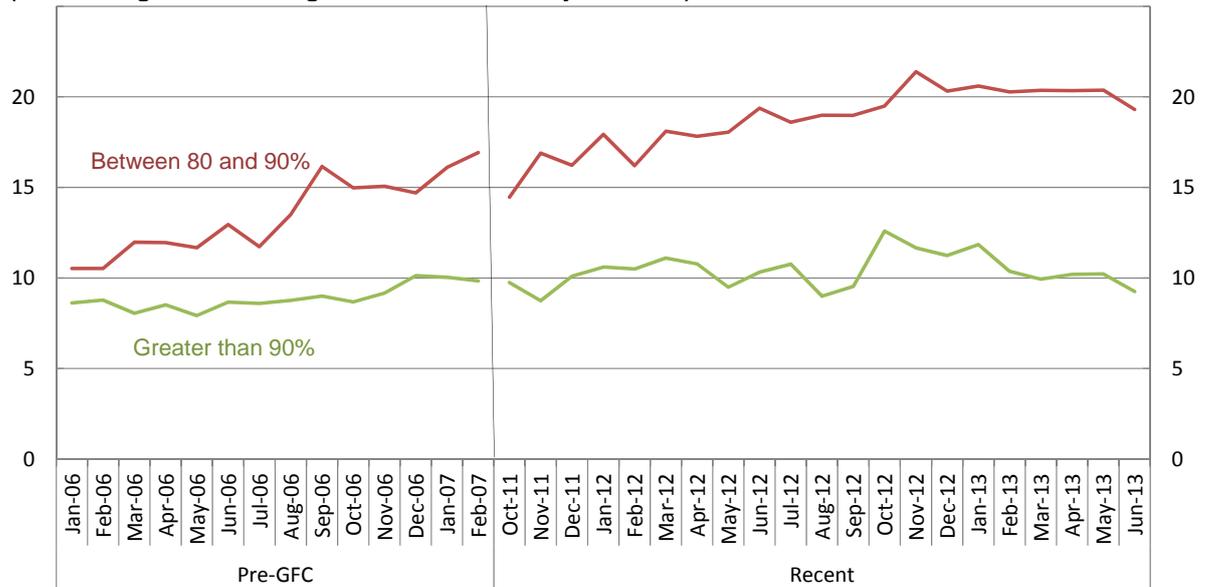
high-LVR borrowers. Indicative data supplied to the Reserve Bank by one of the major banks is consistent with this result.

32. The Reserve Bank's recent analysis of data on banks' loss rates by LVR category, from about 2008 to 2012, showed that loss rates rose following a 10 percent fall in nominal house prices from their 2007 peak. The data showed that loss rates on high-LVR loans generally increased more (in several cases substantially more) during the recent economic downturn than loss rates on lower-LVR loans.⁴ This is consistent with losses on high-LVR loans being more highly correlated, and suggests that high-LVR loans have more systemic risk than lower LVR loans. The view that high-LVR loans contribute more to systemic risk led the Reserve Bank to make changes to banks' capital adequacy requirements for high-LVR loans, as described in the section on micro-prudential policy settings, below.
33. The literature tends to support this proposition, indicating that high-LVR loans are more prone to default in a scenario where house prices fall sharply. Lydon and McCarthy (2012) investigate the relationship between current LVRs and the likelihood of default in Ireland over 2009-2011, when house prices fell by more than 40 percent. They find a strong relationship between current LVR (updated to account for falls in house prices) and those loans that defaulted – loans with a current LVR of 110-120 percent had an 8 percentage point higher default rate than loans with LVRs of below 50 percent. Using the same data, Kelly (2012) finds a strong non-linear relationship between probability of default and current LVR.
34. A large United States literature provides further evidence that high-LVR lending is more prone to default. For example, Herkenhoff (2012) finds that an unemployed person is significantly more likely to default if they also have negative equity. Elul et al (2010) finds that illiquidity, as measured by high credit card utilisation rates, and negative equity have a similarly sized and significant effect on mortgage default, and the effect of illiquidity increases when the borrower is in negative equity.⁵
35. Private reporting data from the major New Zealand banks show that high-LVR lending forms a significantly larger share of new mortgage lending in New Zealand than prior to the GFC (see figure 8 below). In recent months, high-LVR lending (over 80 percent LVR) has accounted for approximately 30 percent of new residential mortgage lending by banks in New Zealand. This has increased from approximately 23 percent in late 2011.

⁴ While the fall in house prices and the deterioration in the labour market accompanying the downturn in 2008-2012 were significant, they were less marked than observed in many other countries over the same period. Consequently, the loss rates observed during this period are unlikely to be representative of those that would be experienced during a more severe economic downturn.

⁵ When interpreting these results, it is important to note that mortgages in many states in the United States are 'non-recourse' (meaning that lenders cannot capture income or other assets of a defaulting borrower). This increases the incentives on borrowers to strategically default, but there is evidence that the significant costs of defaulting limit this behaviour. Foote et al (2012) show that negative equity is a necessary, but not sufficient condition, for mortgage default by United States borrowers. This suggests that the United States' evidence is still of some relevance for markets like New Zealand where lenders have recourse to the borrowers, so borrowers cannot easily walk away from their mortgage.

Figure 8: Residential mortgage lending by loan-to-value ratio
(Percentage of new origination flows of major banks)



Source: Based on private reporting by ANZ, ASB, BNZ, Westpac; data not standardised and definitions may vary across banks.

36. Figure 8 also shows similar data collected from the major banks over 2006 and 2007, a time when the Reserve Bank was also concerned about signs of increasing risk appetite on the part of banks. The share of high-LVR lending by the major banks was 27 percent at that time; it is currently 29 percent. The Reserve Bank believes the rising share of high-LVR lending to be a factor contributing to house price inflation, increasing the likelihood and magnitude of a correction at some point in the future.

Policy settings

Micro-prudential policy

37. Residential mortgage lending is the single biggest exposure of New Zealand's banking system. Therefore the housing sector is a key area for the Reserve Bank's assessment of financial stability when setting its micro-prudential requirements.
38. The Reserve Bank imposes risk-weighted capital requirements on banks, calibrated so that capital covers normal and downturn risk. Banks are required to hold enough capital to meet unexpected losses (with a probability of 0.999 over one year), and all banks hold buffers in excess of the minimum. Model risk and 'fat tails' may mean that, in practice, the probability may be somewhat lower than that. These requirements can be expressed in the form of a risk-weight as a percentage of the bank's exposure or as a percentage of the balance of the loan. Higher risk-weights mean more capital must be held per dollar of lending for the type of exposure in question. High-LVR lending is therefore subject to higher risk weights.
39. Since 2008, the Reserve Bank's capital adequacy requirements have been based on the global regulatory standard known as Basel II.⁶ The precise calculation of risk-

⁶ The Basel III requirements that took effect for New Zealand banks from 1 January 2013 complement, rather than replace the Basel II regime. Ultimately, banks' capital requirements are expressed in the form of a capital ratio (capital divided by risk-weighted assets). Basel II is primarily about how to measure the denominator (risk-weighted assets). Basel III is primarily about the ratio itself (increasing it) and the numerator of the ratio (what counts as capital).

weights for a bank depends on which one of two broad approaches to calculating capital it uses. The default or 'standardised' approach prescribes a set of risk-weights corresponding to broad categories of loan (corporate, housing and so on). The 'internal models' approach uses banks' own models – which must be approved for use by the Reserve Bank – to estimate the value of certain risk parameters that feed into an equation that generates the appropriate risk-weight.⁷ Currently, the four largest locally-incorporated New Zealand banks use the internal models approach.

40. The Reserve Bank has recently reviewed the scale of housing risk weights in relation to residential LVRs. The outcome of this review is an increase in the required levels of regulatory capital for high-LVR lending by internal models banks, and amount to an average increase in capital for residential mortgage loans for internal models banks of about 12 percent. These requirements come into effect from 30 September 2013. The Reserve Bank is also currently reviewing the overall calibration of banks' capital for residential mortgage lending, and the relativity between the capital requirements for standardised and internal models banks.
41. The Reserve Bank's steady-state micro-prudential settings are designed to protect banks' balance sheets even in quite extreme scenarios. It considers that New Zealand's banks are currently well capitalised, providing them with significant resilience to house price shocks. It expects this resilience will be further improved as a consequence of the changes arising from the review.
42. However, steady state micro-prudential settings may be limited in their ability to deal with cyclical extremes driven by irrational expectations. If house price appreciation and increasing household indebtedness are sustained and become excessive, this has the potential to exacerbate the risks of a credit crunch at the point when the financial cycle eventually turns. Although the micro-prudential settings mean the resilience of individual banks will be maintained, even in a severe downturn scenario, these settings cannot protect the financial system from the overly-cautious sentiment and deleveraging resulting from the downturn, which would restrict credit and intensify the downturn. Macro-prudential policy offers scope to take actions to support the availability of credit to creditworthy borrowers in a downturn.

Monetary policy

43. Monetary policy responds to house prices via their effect on broader inflation pressures. House prices themselves do not enter the CPI inflation measure directly, but housing construction costs enter the CPI directly, and also indirectly through resource costs. These pressures can occur when wealth effects push consumption ahead of income growth, and households borrow against housing capital gains.
44. The effect of current strong housing demand on CPI inflation is being offset by other influences such as the strong New Zealand dollar, and CPI inflation remains slightly below the Reserve Bank's target of 1 to 3 percent. While tightening monetary policy by increasing the Official Cash Rate would help constrain demand for mortgage finance, by increasing mortgage rates, it would risk CPI inflation remaining below the target range.

⁷ Hoskin and Irvine (2009) provides more detail about the Basel II regime, the Basel equation, the Reserve Bank's modelling of housing risk and its views on the parameters of the Basel equation.

Objectives and assessment criteria

45. Under section 1A of the Act, the Reserve Bank is responsible for, *inter alia*, promoting the maintenance of a sound and efficient financial system. The framework for the Reserve Bank's regulation and supervision of registered banks in New Zealand is governed by Part 5 of the Act. Section 68 requires the Reserve Bank to exercise the powers conferred on it for the purposes of:
- a promoting the maintenance of a sound and efficient financial system; or
 - b avoiding significant damage to the financial system that could result from the failure of a registered bank.
46. As part of its regulation and supervision of registered banks, the Reserve Bank has developed a framework for macro-prudential policy (RBNZ, 2013c). The macro-prudential policy objectives are set out in the Memorandum of Understanding between the Reserve Bank and the Minister of Finance (MOU)⁸, and are to:
- a build additional resilience in the financial system during periods of rapid credit growth and rising leverage or abundant liquidity; and
 - b dampen excessive growth in credit and asset prices.
47. These objectives link back to the purposes in sections 1A and 68(a) of the Act, namely promoting the maintenance of a sound and efficient financial system, in that:
- i. macro-prudential policy can complement micro-prudential policy in maintaining the soundness of the financial system by creating additional resilience when it appears credit and asset price developments have become or are becoming unsustainable.
 - ii. excessive growth in credit and unsustainable asset price developments are likely to impinge adversely on financial system efficiency due to allocative inefficiency arising from asset prices diverting significantly from their fundamentals, and the tendency for the flow of credit to tighten sharply and disruptively in a downturn.
48. These two objectives also have the positive externality of promoting the purposes in section 68(b) as well, as they will help to avoid the significant damage to the financial system that could result from the failure of a registered bank.
49. The Reserve Bank's intention in responding to the current housing credit and house price developments is primarily to help dampen the threat of excessive housing credit growth and house price inflation, to counter future instability in the financial system that could arise from unsustainable increases in housing credit and house prices. The Reserve Bank does not perceive a material issue with bank resilience currently or in the short term: building resilience would be a useful side benefit of any macro-prudential intervention at this time.
50. The options discussed below have been assessed in terms of their effectiveness at achieving these objectives. The Reserve Bank has also had regard to the efficiency of each of the options; the regulatory burden imposed on the registered banks and other parties; and international best practice.

⁸ The MOU was signed on 13 May 2013, and is available from:
http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/5266657.html

Regulatory impact analysis

Section One: Options

51. The Reserve Bank has considered three regulatory options for dealing with the issues outlined in the problem definition:
 - i. maintain existing micro-prudential policy settings for high-LVR residential mortgage lending (including the changes outlined above);
 - ii. imposing temporary additional capital requirements for residential mortgage lending; and
 - iii. imposing temporary restrictions on high-LVR residential mortgage lending.
52. The first option best reflects the status quo, as it involves current micro-prudential policy settings, and changes to these settings that have already been announced. The second two options involve the use of new macro-prudential instruments, designed to temporarily supplement micro-prudential settings in times of excessive house price and credit growth.
53. Each of these options can be introduced under existing legislation, via banks' conditions of registration. Section 74 of the Act gives the Reserve Bank power to impose conditions of registrations on banks. These may relate to matters including capital (section 78(1)(c)) and risk management systems and policies (section 78(1)(fa)). This power must be exercised for the purposes in section 68 of the Act, as outlined in the 'Objectives and assessment criteria' section.

Option One: Existing micro-prudential policy settings

54. The micro-prudential capital framework recognises the increased risk associated with high-LVR residential mortgage lending. Banks are able to undertake high-LVR residential mortgage lending without restriction, but this lending is subject to higher capital requirements.
55. Option one is to maintain the existing micro-prudential policy. As noted above, these requirements have recently been reviewed, and will shortly include increased capital requirements as a result of the Housing Review.

How capital requirements work

56. The new capital requirements will increase internal models banks' regulatory capital for residential mortgage lending by an average of around 12 percent. This makes such lending less attractive for banks, as it becomes comparatively more expensive. The actual cost to banks of holding this extra regulatory capital will depend on the extent to which banks increase their overall holdings of capital, rather than absorbing the increase by reducing their voluntary buffers. By making this lending less attractive for banks, the supply of high-LVR loans would be expected to reduce.
57. Increasing the capital requirements could also flow through to lending rates. From its modelling of the announced increase in capital requirements, the Reserve Bank expects that lending rates could increase by approximately 4-6 basis points in the short-term to the extent banks allocate additional capital across the entire housing portfolio. If the additional capital is allocated only to high-LVR loans, then it is expected that lending rates for these loans could increase by approximately 20-30 basis points (RBNZ, 2013b).

Benefits

Effect on house price and credit growth

58. *Ceteris paribus*, the increase in lending costs from increased capital requirements could be expected to flow through to lending rates and increase the cost of purchasing a house. Some marginal borrowers could be priced out of the market, or face reduced borrowing capacity. Over the medium term this could reduce demand for housing and place some downward pressure on house prices.
59. However, in practice, other factors influence banks' cost of lending, which may dampen this effect. The pricing of a loan facility is affected by other non-capital related factors such as a bank's own cost of funds (debt and equity), its assessment of the riskiness of the loan/sector, and its competitive positioning. For example, the Reserve Bank does not believe there is strong evidence that the imposition of higher capital requirements for agricultural exposures in mid-2011 significantly reduced the supply of agricultural lending.⁹
60. International evidence also suggests only a modest effect on house price and credit growth, with a number of countries finding it necessary to supplement increased capital requirements with other measures to help manage the risks associated with rapid growth in housing credit and house prices.¹⁰
61. Therefore, while the Reserve Bank recognises that these new requirements are yet to come into force and that their full effects are yet to be seen, it considers that this option is unlikely to adequately provide any substantive assistance in achieving the objective of supporting financial system efficiency through dampening the pace of future housing credit and house price growth.

Effect on resilience

62. The changes to the capital requirements are expected to strengthen the resilience of the financial system. Banks may try to partially meet the increased capital requirement by reducing the supply of credit so as to limit the additional capital required to be held, indirectly enhancing bank resilience through tighter risk management.
63. However, as this option (once the changes are in place) reflects the status quo, it will not provide further resilience to any future excessive house price and credit growth. The Reserve Bank's steady state capital settings are calibrated to a conservative level, on a 'through-the-cycle' basis. This includes severe downturns under normal market behaviour conditions but, as noted, would not fully address any future irrational behaviour or asset price bubbles if the market became detached from fundamentals.

⁹ While agricultural lending growth slowed dramatically from 2009 onwards, this appears to have been a reflection of more difficult economic conditions and a revision to lending policies by the banks themselves.

¹⁰ For example, the Bank of Israel increased capital requirements on residential mortgage lending above 60 percent LVRs in 2010, and subsequently also introduced a cap on high-LVR lending in 2012.

Costs

64. The initial cost will be to the banks in meeting the increased capital requirements. As noted above the changes to the capital requirements will increase internal models banks' regulatory capital by an average of around 12 percent. This may have a short term impact on profitability rates, although this could be offset by the higher level of capitalisation reducing the required return on equity.
65. After the changes have been made, then any resulting increase in lending rates that persists could have the effect of pricing some marginal borrowers out of the market. However, given the number of factors that influence whether increased capital requirements flow through to increased lending rates, we do not expect that many borrowers would be affected.

Option Two: Temporary additional sectoral capital requirements

66. A second option is to introduce temporary additional sectoral capital requirements (SCRs) for residential mortgage loans. They would be implemented through a capital add-on that is calibrated as a proportion of the bank's risk-weighted exposures to the housing sector. This would be applied over and above the micro-prudential capital requirement.
67. As the SCR is a temporary measure, it would be released once pressure on house prices and credit growth had dissipated sufficiently. Identifying the appropriate timing for imposition and release of an SCR would be important for the successful use of the instrument.
68. Many countries, including advanced economies and emerging market economies, have used SCRs to address various risks in their economies. Some examples are set out in Appendix A. Although some of the SCRs cannot be interpreted as dynamic, 'macro-prudential' SCRs – some are simply recalibrations of prudential settings associated with the country's capital adequacy framework (i.e. option one) – they are generally put in place to build buffers or reduce overheating in specific sectors. To the extent that a country has reversed or loosened a recalibration once the risk has reduced, it has essentially been used as a macro-prudential tool.

How SCRs work

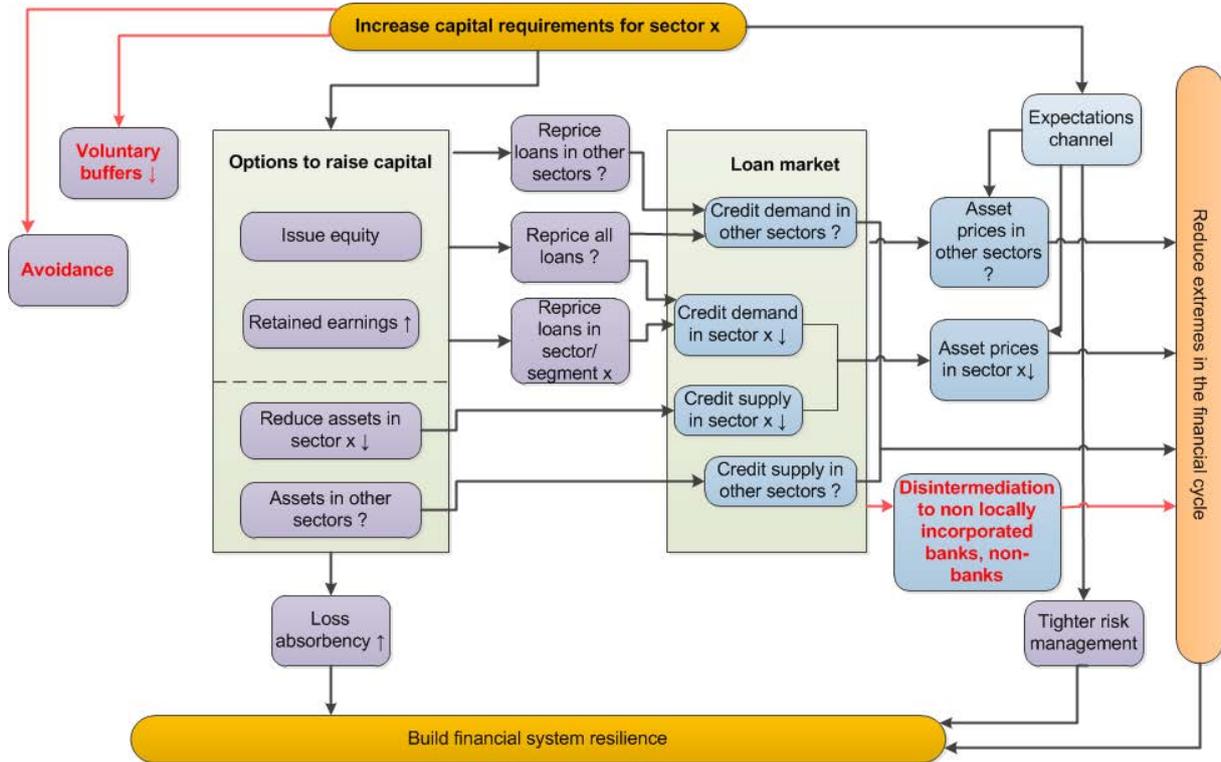
69. The SCR would assist the micro-prudential capital in absorbing loan losses and, as with option one, would help to alter the relative attractiveness of lending to the sector or sub-sector.
70. Under this option, the Reserve Bank would require locally-incorporated banks¹¹ to temporarily hold an additional 2.5 percent of Common Equity Tier 1 (CET1) capital

¹¹ Reciprocity arrangements for foreign bank branches that are operating in New Zealand, or an offshore bank lending directly to New Zealand borrowers, would be determined in discussion with the home supervisors. We do not expect branches to be quantitatively important, given the current structure of the New Zealand banking system, and the Reserve Bank's local incorporation policy, which restricts the scale of branches' retail business in New Zealand. Applying this requirement to locally-incorporated banks only will still capture nearly 91 percent of credit intermediated in New Zealand.

on all their residential mortgage lending.¹² This would be imposed as an overlay, so each bank would be required to increase their CET1 capital ratios by 2.5 percent, or face restrictions on profit distribution. Banks would have three months notice of the imposition of an SCR.

71. Part of the effective transmission of the policy is the market's expectations. Figure 9 illustrates the major transmission channels through which the SCR overlay could help meet the policy objectives.

Figure 9: Transmission map of sectoral capital requirements



Key: purple background – bank reactions; blue background – market reactions; red text – policy leakages.

72. The transparency of the policy signal is key to the development of expectations. As regulatory capital requirements are not particularly transparent to the public, the signal that this would send generally about the Reserve Bank's view of high-LVR lending could be weak. On the other hand, such measures would be likely to send a reasonably powerful signal to banks of the Reserve Bank's discomfort with housing credit developments.

¹² The SCR could be targeted to a particular sub-sector, such as high-LVR or investment residential mortgage lending. However, in their submissions to the consultation on macro-prudential policy, banks noted that this would increase complexity and implementation costs. Further, as noted above under option one, although banks would incur the additional capital requirement on this lending, they can choose to allocate the additional capital across all lending. Therefore, as targeting the SCR would be costly and would not necessarily flow through to the cost of lending for that sub-sector, the proposed calibration is at the sectoral level.

Benefits

Effect on house price and credit growth

73. Any impact on house prices and credit growth would be indirect via pricing, credit supply or expectations. SCRs have the potential to increase banks' funding costs¹³ which would likely increase housing borrowing costs. The Reserve Bank estimates that the proposed calibration would have a 5 -10 basis point effect on mortgage interest rates, should banks choose to re-price lending to the housing sector.
74. However, the effect of any increase in funding costs on the demand for housing credit, and on house price growth, is unclear. As noted in the discussion of option one, there is no direct relationship between regulatory capital requirements and the price of lending. In their responses to the macro-prudential policy consultation (RBNZ, 2013a), banks noted that they might choose to allocate increased costs in a number of ways. As reflected in figure 9, banks could increase pricing across all their lending, or lending to other sectors, or they could increase pricing on lending to the housing sector or just on high-LVR housing loans. How they chose to allocate lending costs would depend on factors such as competitive positioning.
75. SCRs may also affect house prices through the expectations channel; expectations of slower housing credit growth due to the higher cost of lending may lead to a downward revision of house price expectations.
76. International evidence on the effect of SCR on housing credit demand is reasonably limited, and rather mixed. Crowe et al (2011) indicates that attempts by Bulgaria, Croatia, Estonia, and Ukraine to use SCRs to halt real estate booms were unsuccessful. However, India increased risk weights on commercial real estate in July 2005 and May 2006, and credit growth in that sector fell from annual growth rates of 150 percent in 2005 to 50 percent in 2008. Interpretation of this evidence is complicated by the fact that it is difficult to isolate the effect of the SCR from other financial stability initiatives India was undertaking at the time. In terms of the effect on prices, Crowe et al (2011) shows that, in countries where increasing SCRs affected sectoral credit growth, it didn't seem to affect real estate price appreciation, or overall credit growth.

Effect on resilience

77. The SCR would help banks to build a buffer against a downturn in the housing market, helping them to weather greater losses before their solvency was affected. An SCR of 2.5 percent is estimated to increase average bank capital requirements by about 1 percentage point. Banks may try to partially meet this by reducing the supply of credit so as to limit the additional capital required to be held, indirectly enhancing bank resilience through tighter risk management. This buffer could then be used by banks to continue lending in a downturn, helping to ensure credit remains available during this time, improving financial system resilience.
78. However, unlike option one, the SCR is a *temporary* increase in the capital requirement. The majority of banks voluntarily hold large capital buffers over the minimum regulatory capital requirements, so the success of an SCR at building resilience would likely be affected by the extent to which the banks simply absorb the temporary increase in the requirement in this buffer. If banks chose to temporarily

¹³ Funding costs should increase in the short term, at least. Over the longer term, a higher level of capitalisation would be expected to reduce the risk of bank default, potentially reducing the cost of debt funding (GCFS, 2012).

reduce their buffer, rather than increasing capital, there would be no impact on resilience. However, banks' submissions to the consultation on macro-prudential policy did not suggest that this would be a typical response, with some banks noting that internal policies on minimum capital ratio settings would rule out such a response.

Potential policy leakages

79. Figure 9 shows three potential channels (in red) that could reduce the effectiveness of SCRs: avoidance, disintermediation, and a reduction in voluntary buffers. Overall, the impact of the SCR would depend on the extent to which it actually resulted in an increase in capital held.
80. If there was an increase in the capital held, which increased the cost of borrowing significantly, then this would encourage disintermediation. Should lenders that are not subject to the SCR expand their activity to fill any unmet demand, this would reduce the impact of SCRs on the financial cycle and any efficiency gains. The impact of disintermediation on financial system resilience/soundness is likely to be smaller, given that these lenders fall outside the core banking system.
81. The use of an SCR for housing lending could potentially create incentives for banks to reclassify their housing exposures to other sectors to reduce the overall capital required. Housing capital requirements are often lower than those for other sectors, reducing the capacity for such actions, but the Reserve Bank would also closely monitor for signs that such activity was occurring.
82. Finally, it would also reduce the effectiveness of the policy if the banks simply reduced the buffers they voluntarily hold, and did not increase their holdings of capital in response to the SCR.

Costs

83. The initial cost of an SCR would be to the banks, which would have a three month timeframe in which to increase their capital. Most banks would be well placed to meet the increase in capital required by the proposed calibration, absorbing it in their voluntary buffers. Having to hold this additional capital would limit the amount of credit the banks could provide, which would temporarily restrict their profit opportunities.
84. Aside from the costs related to raising the additional capital, the costs to banks of an SCR would be minimal. The proposed calibration represents an overlay on a pre-existing requirement, and it does not require distinguishing between high-LVR and other residential mortgage lending.
85. Likewise, additional compliance monitoring and enforcement costs for the Reserve Bank would be low, as it would be monitored as part of the Reserve Bank's current supervision. The Reserve Bank would have to closely monitor the effect of the SCR on the financial system, to whether/when it should be released, but much of this monitoring is already undertaken, so the additional cost would be minimal.
86. An SCR which increased lending rates could mean some borrowers were priced out of the market, preventing them from purchasing a house, or some small-and-medium enterprises (SMEs) from borrowing against residential property. It could also mean a loss of profit for some residential property investors. This could have a flow-on effect for other sectors that service these borrowers, such as the building and construction sector, or on the demand for legal services.

87. It is unclear what proportion of borrowers would be affected by an SCR. However, given the estimated impact on mortgage interest rates is 5-10 basis points, the effect would be expected to be minimal. Further, as the proposal is for a time-varying SCR, these effects would only be temporary.

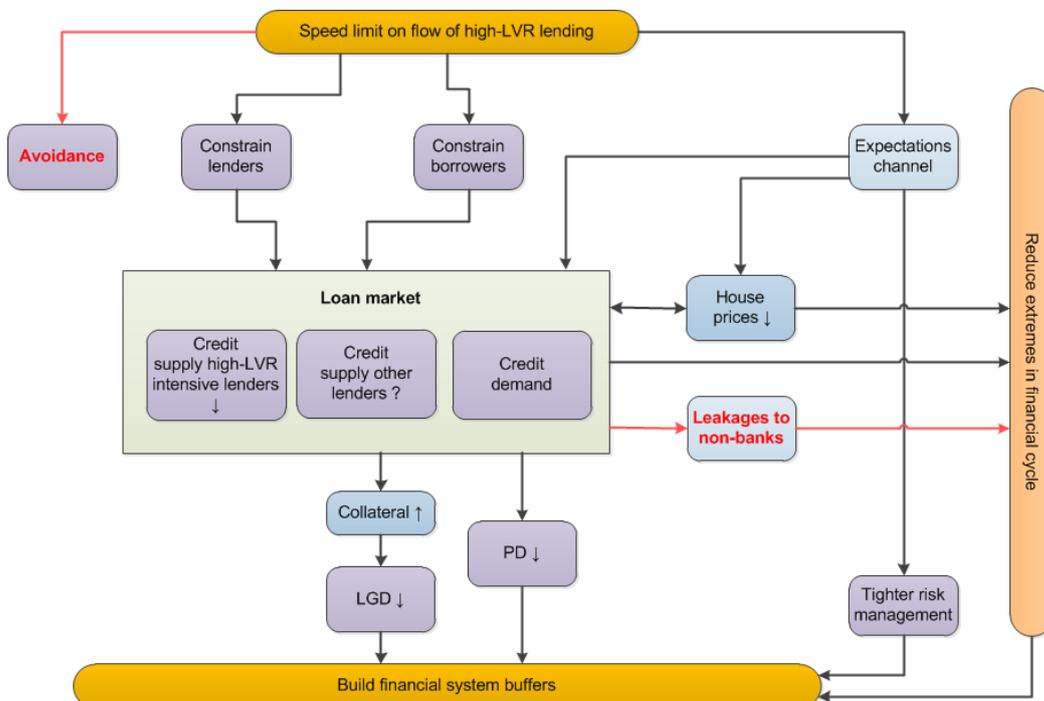
Option Three: Temporary restrictions on high-LVR lending

88. Under this option, the Reserve Bank would set temporary quantitative restrictions on the residential mortgage lending that banks could undertake at certain LVRs. As with SCRs, LVR restrictions would be temporary, and would be removed when the housing market had returned to a better balance of supply and demand.
89. Several countries utilise LVR limits, with some Asian countries having actively used them since the 1990s to respond to developments in the real estate market. They have increasingly been adopted during the post-crisis period. Some examples of the use of LVRs are set out in Appendix B.

How LVR restrictions work

90. LVR restrictions would directly affect the supply of credit. Unlike SCRs and micro-prudential capital requirements, they would constrain both lenders and borrowers. LVR restrictions are also very transparent, and would be likely to have a bigger impact on the market's expectations of house prices and credit growth than the other options.
91. Figure 10 illustrates the major transmission channels through which a 'speed limit' could help meet the policy objectives. Again, a key aspect is the expectations channel, whereby expectations regarding the effect of the LVR restriction help to increase its effectiveness.

Figure 10: Transmission map of speed limits on high-LVR lending



Key: purple background – bank reactions; blue background – market reactions; red text – policy leakages.

Note: LGD is loss given default; PD is probability of default.

Proposed calibration

92. At its most basic, an LVR restriction could involve an LVR threshold for lending, typically somewhere in the range of 80-90 percent, with all new loans/refinancing above this threshold temporarily prohibited. However, the Reserve Bank's preferred approach is a 'speed limit', restricting the proportion of new lending above a certain LVR as a share of total new lending.
93. Using the speed limit approach under consideration, the Reserve Bank would restrict residential mortgage lending at LVRs of over 80 percent to no more than 10 percent of a bank's *new* residential mortgage lending. This would be measured on a rolling six-month basis for banks with average residential mortgage lending below \$100 million per month (on a three-month moving average basis), and on a rolling three-month basis for all other banks. The restriction would apply to all new lending secured over residential property, irrespective of the purpose of that lending.
94. Some lending would be exempt from this restriction, including:
 - i. loans made under Housing New Zealand's Welcome Home Loans scheme;
 - ii. bridging loans;
 - iii. the refinancing of existing high-LVR residential mortgage lending; and
 - iv. the transfer of an existing high-LVR residential mortgage loan to another residential property.
95. The first exemption covers lending where there is a clear government housing policy objective and the credit risk is borne by the government. The latter exemptions are intended to reduce the efficiency costs of imposing LVR restrictions without unduly undermining their effectiveness. To limit disintermediation, the Reserve Bank would restrict the provision of second mortgages by banks, and prevent banks from agreeing to second mortgages by third parties if doing so would take the borrower's total LVR beyond the maximum permitted.
96. The Reserve Bank has given considerable attention to the merits of exempting some types of housing loans from LVR restrictions, including those provided to first home buyers (FHBs), in order to reduce the potential negative welfare effects of restricting lending. However, it considers that exempting FHBs would significantly undermine the restriction as FHBs are a significant proportion of new high-LVR residential mortgage lending.
97. In principle, LVR restrictions could be targeted to particular geographic regions. However, the use of targeted restrictions is not contemplated at this point. Geographic targeting would be administratively complex, and would require difficult decisions to be made defining 'problem' areas.
98. Furthermore, feedback to the Reserve Bank's March 2013 macro-prudential consultation was that exemptions of large categories of borrowers, such as FHBs, or more targeted restrictions, such as lending to 'Auckland', would be more complex and costly for banks to implement, and difficult for the Reserve Bank to monitor and enforce. Likewise, distinctions based on the purpose for the lending would be similarly complex.

Benefits

Effect on house price and credit growth

99. LVR restrictions would be likely to be more effective than the other two options at reducing house price growth, because LVR restrictions would directly affect the supply of housing credit. LVR restrictions would also limit the funding available to certain borrowers, reducing housing demand. These combined effects on the supply of and demand for housing credit would dampen credit growth. This would help to reduce households' ability to borrow against existing equity in their house (i.e. refinancing or equity withdrawal), and ease house price inflation. Further, such restrictions could be expected to help curb expectations and speculative incentives.
100. The effect a restriction had on house price and credit growth could be diluted by banks seeking to maintain their high-LVR lending, for example by offering preferences to, or reducing the price of lending for, low-LVR borrowers so as to increase their total residential mortgage lending (the denominator in the restriction). The effect could also be diluted to the extent that the restriction limited the financing of construction and potential increases in housing supply.
101. The available international evidence suggests that imposing LVR limits during booms slows down real credit growth and house price appreciation. However, these estimates need to be interpreted with caution as they mostly rely on the experience of a small number of Asian and Eastern European economies that have very different financial systems to New Zealand. LVR limits have also typically been used in conjunction with other tools, further complicating the estimation of their effects. The Reserve Bank's proposal is also for a restriction rather than a total ban on high-LVR lending.
102. LVR limits are typically imposed during periods where house price and credit growth have significant momentum. Despite this, a simple calculation by the IMF (2011b), using cross-country data since 2000, finds that credit growth and house price inflation slowed following the implementation of LVR limits in more than half of cases where the tool was used. A more sophisticated estimation approach found that the introduction of LVR limits reduced the pro-cyclicality of credit growth (as measured by the correlation between credit growth and GDP). Studies estimating the effects of LVR caps in Hong Kong (Craig and Hua (2011), Wong et al (2011)), Korea (Igan and Kang, 2011), and most recently in Canada (IMF, 2012), have found that restrictions had a significant impact on housing transactions, house prices, house price expectations and/or housing credit growth.
103. A recent study by Kuttner and Shim (2012) uses a large cross-country dataset, including both emerging and advanced economies, to estimate the effects of macro-prudential interventions on house prices and credit growth. They confirm the finding noted above that changes in the maximum LVR and/or restrictions on debt servicing ratios have significant effects, and estimate that a reduction in maximum LVR of around 10 percentage points slows real house price growth by around 4 percent, estimated to be equivalent to a 200 basis point increase in short-term interest rates. IMF (2012) performs a similar exercise focussing on the impact on credit growth, finding that a 10 percentage point tightening was associated with a reduction in total credit of around 1.3 percent – equivalent to approximately a 3-5 percent reduction in mortgage credit.
104. A lack of data and previous experience with LVR restrictions in New Zealand makes it difficult to estimate the effect on credit growth and house prices of the proposed calibration. However, the Reserve Bank's modelling, based on current high-LVR

mortgage flows suggests that the proposed calibration could result in 1-3 percentage points lower credit growth for the first year that the restriction was in place, *ceteris paribus*. This reduction is likely to come about through a combination of slower housing market turnover, reduced house prices and higher average deposits for house purchases.

105. The Reserve Bank's modelling also suggests that house price inflation could be 1-4 percentage points lower over the first year. This reduction is expected to arise from reduced competition for houses, a direct lowering of the price that some purchasers are able to pay, and reduced house price expectations as a result of the restriction.
106. As noted, it is difficult to compare these results with the international literature on LVR effectiveness, due to differences in the calibration of LVR restrictions and different institutional frameworks operating in those countries. However, for the most part, the international literature tends to suggest that the effect of LVR restrictions could be at the upper end of these indicative ranges.

Effect on resilience

107. Unlike the other options, LVR restrictions would not directly increase resilience by building capital buffers. Rather, LVR restrictions would limit the risks to which banks were exposed. Probability of default (PD) would be reduced as a greater proportion of new borrowers would have higher equity buffers to withstand negative shocks, such as rising interest rates or a shift to unemployment. Loss given default (LGD) would also be reduced, as the LVR restriction would reduce the amount that could be borrowed against the value of a property, limiting leverage.
108. The evidence of the impact of LVR restrictions on financial system resilience is mixed. An IMF study (2011b) found that LVR limits did not have the same impact as capital requirements at reducing the procyclicality of leverage of the financial system (as measured by the ratio of assets to equity).
109. However, there is some evidence supporting the proposition that LVR restrictions indirectly increase the resilience of banks by increasing the resilience of borrowers. Specifically, several studies find that tighter LVR limits reduce the sensitivity of households to income and property price shocks (CGFS, 2012). Hong Kong provides an example of an economy that imposed LVR caps and was able to withstand substantial falls in housing prices with only modest loan losses for banks (Wong et al, 2011). In Sweden, guidelines limiting LVRs in excess of 85 percent led to a reduction in households' debt-to-disposable income, indicating improved repayment ability, reduced sensitivity of debt servicing burdens to a change in interest rates, and reduced PD.
110. In addition, should LVR restrictions mitigate future house price corrections, the impact on banks' balance sheets would also be lessened. IMF (2011a) reviewed house price corrections in OECD economies since 1980. It concluded that falls in house prices were significantly more severe for economies that engaged in high-LVR lending. International evidence also suggests that lower LVRs reduce the sensitivity of house prices to income, indicating that an LVR restriction could reduce the decline in house prices accompanying any future decline in household incomes.
111. In most OECD economies that have LVR restrictions, the maximum LVR ratio is a structural feature of their financial system and is not adapted over time in response to house price cycles. However, Hong Kong, Korea and Singapore have all used LVR restrictions in a time-varying fashion, and there is some evidence that these economies have experienced a reduced sensitivity of mortgage default to house price falls (Wong et al, 2011).

112. In New Zealand, applying LVR restrictions to the flow of new mortgage lending would take a period of time to materially change bank balance sheets. Therefore, the impact of LVR restrictions on banks' resilience in a housing downturn would depend crucially on how long restrictions had been in place prior to the downturn. The Reserve Bank's analysis, based on internal stress testing models, suggests if the proposed LVR restriction was in place for two years prior to a severe housing market downturn, it would reduce losses on residential mortgage loans by 10-15 percent.

Potential policy leakages

113. Figure 10 shows two potential channels (in red) that could reduce the effectiveness of LVR restrictions: avoidance and disintermediation. Leakages represent direct efficiency costs, due to the allocation of resources to avoidance activity, and the deterrence of such activity. As lenders and borrowers discover ways to circumvent the restriction, its effectiveness would diminish, reducing the efficiency that could be gained from leaning against the credit cycle.
114. Banks could avoid the restriction by offering unsecured lending, top-ups or second mortgages, or by reclassifying high-LVR housing exposures as exposures to other sectors. The Reserve Bank would monitor the extent to which these types of lending increased, and would frame the LVR restriction so as to reduce and discourage avoidance by banks as much as possible, for example, by limiting the use of top-ups and second mortgages. The additional cost of unsecured lending would be expected to dampen demand for this credit.
115. The Reserve Bank would expect banks to not enter into or promote arrangements to avoid the restrictions, and would provide guidance as to what it would consider to be avoidance activity. If concerns arose, the Reserve Bank would look closely at the extent to which a bank was increasing its use of or marketing such arrangements, and would respond to such activity.
116. Borrowers could avoid the restriction via disintermediation through various channels, such as being given the deposit, borrowing from family members or borrowing from non-regulated lenders. Given that LVR restrictions would apply to all registered banks, and not just internal models banks (as for option one) or locally-incorporated banks (as for option two), avenues for disintermediation are fewer. However, the Reserve Bank believes that a proportion of affected borrowers would find a way of avoiding the restriction.
117. While the LVR restrictions would not prevent borrowers from obtaining high-LVR loans through non-banks, the ability of non-bank deposit takers to fund these loans in high volume (rather than simply top up first mortgages) is likely to be limited. The Reserve Bank would monitor the extent to which lending by non-bank lenders increases. To the extent such lending impacts upon the restriction's effectiveness, the Reserve Bank would consider applying LVR restrictions to non-bank lenders. Borrowers could also look to friends and family members for housing finance; this is not something that the Reserve Bank could or should do anything about, but this funding is limited, and is unlikely to contribute significantly to disintermediation.

Costs

118. Banks would bear the initial costs of implementing an LVR restriction. A number of banks already have internal lending targets based on LVR, which would be likely to assist them in implementing the policy. Submissions to the consultation on macro-prudential policy outlined the various changes that would be associated with implementation of an LVR restriction, but did not provide estimates of the costs associated with these changes.

119. After the initial cost, the restriction would also result in lost profit opportunities for the banks, as housing credit growth diminishes. However, as higher LVR lending tends to have lower return-on-equity, due to higher capital requirements and larger loan losses, the effect on profits is not expected to be significant. Reduced high-LVR lending flows would also likely be offset by an increase in low-LVR lending, as reduced competition in the housing market would encourage buyers with larger deposits into the market.
120. As with SCRs, the Reserve Bank would incur costs of monitoring compliance with the LVR restriction and its effect on the financial system. These costs are expected to be immaterial.
121. The impact of an LVR restriction would be most keenly felt by high-LVR borrowers.¹⁴ A number of high-LVR borrowers would be able to avoid the restriction but some would be temporarily shut out of the market while the restriction was in place, or until they raised a sufficient deposit. The effect on any one group of high-LVR borrowers would depend on how banks rationed their lending to remain within the restriction.
122. Some of these borrowers would be FHBs. Approximately 12 percent of banks' new lending is to high-LVR FHBs. The use of a speed limit approach, rather than an outright ban on high-LVR lending, would help to ensure FHBs continued to have some access to high-LVR lending from banks. Exempting lending under Housing New Zealand's Welcome Home Loan scheme would also allow some FHBs to continue to access finance through this source.
123. FHBs who are unable to borrow would remain in the rental property market. This could result in financial costs to these FHBs if house prices continued to increase while the restriction was in place. They would also lose any welfare gain due to any non-pecuniary benefits that accrue from home ownership.¹⁵ Alternatively, it is possible that FHBs may gain from being temporarily shut out of the market, for example if house prices fall in the future, or if future mortgage rates placed them under financial stress. Costs to FHBs would also be offset to some extent by the opportunity the purchasing delay would provide FHBs to increase savings and reduce the amount ultimately borrowed.
124. Some of these borrowers would be property investors, who represent a smaller share of banks' high-LVR lending. Given investors do not have the same incentives as FHBs, it is expected that most of these borrowers would wait for the restriction to be removed, or purchase at a lower LVR. The LVR restriction would therefore result in delayed or lost profit opportunities for these borrowers.
125. Some of these borrowers would be existing home owners, who may want to top-up their existing mortgage or take out a new mortgage. It is expected that these borrowers would delay their borrowing until the restriction is removed. However, this means that bank lending to SMEs secured on residential property could be affected, which could lead to lost profit opportunities for these borrowers. The Reserve Bank understands that this lending accounts for up to around 30 percent of some banks' new residential mortgage lending, although it is unclear how much is at high LVRs.

¹⁴ It is possible that low-LVR borrowers would experience some benefit from the restriction, as banks would compete for low-LVR lending, particularly as this would allow them to do more high-LVR lending without exceeding the restriction.

¹⁵ The LVR restriction would not be expected to result in an increase in rents. If an FHB is prevented from entering the property market, the property that they would have bought would remain vacant, or it would be bought by an investor who would rent it out. For the most part, an increase in demand for rental properties would be matched by a corresponding increase in supply.

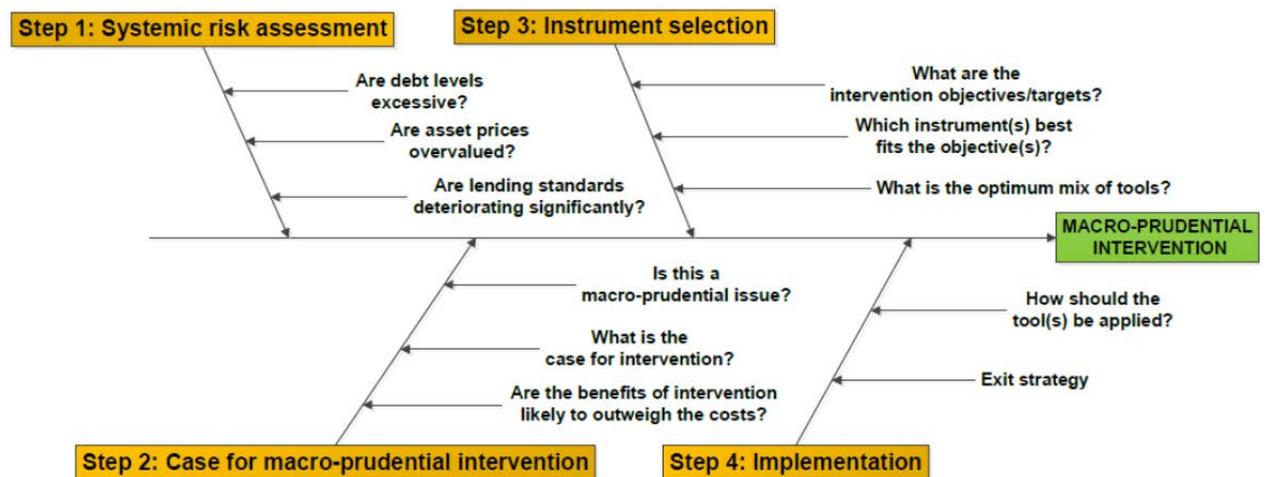
The use of a speed limit approach would help to ensure that SMEs continue to have some access to this finance.

126. As with SCRs, LVR restrictions would have flow-on effects to those sectors that service borrowers, such as the legal services and the building and construction sectors. There is not expected to be a significant negative effect on construction activity, given property developers would be unlikely to be captured by LVR restrictions, and the fact that uncertainties over costs and valuation mean banks are generally cautious when providing high-LVR residential mortgage lending for new construction.
127. There will also be efficiency costs associated with disintermediation and avoidance activity, to the extent that borrowers use less efficient intermediation channels, and expend time and resources seeking to avoid the restriction.
128. As with SCRs, it is uncertain how many and what type of borrowers will be impacted by an LVR restriction, and what that impact would be, so a total 'cost' of imposing an LVR restriction cannot be established. However, it is expected that the temporary nature of the restriction, and calibration as a 'speed limit' rather than an outright ban, would limit the costs associated with an LVR restriction.

Conclusions and recommendations

129. As set out in section 1A(1)(b) of the Act, the Reserve Bank is responsible for promoting the maintenance of a sound and efficient financial system. Macro-prudential tools can be used by the Reserve Bank to manage risk in the financial system arising from transient but pervasive macro-financial developments, such as credit and asset price cycles or major international financial shocks. These tools can help to achieve the Reserve Bank's objectives by:
- i. increasing the resilience of bank balance sheets to a potential shock (which also gives them a greater capacity to keep lending in the downturn) (the soundness objective); and
 - ii. seeking to dampen a credit and asset price cycle on the upswing in order to reduce the likelihood and severity of the eventual downturn (the efficiency objective).
130. The Reserve Bank has developed a four step framework for decisions relating to macro-prudential tools, as depicted in figure 11.¹⁶

Figure 11. Macro-prudential decision making framework



131. Step one involves a systemic risk assessment, focussing on whether debt levels and asset price imbalances are, or are likely to become, excessive, and whether lending standards are deteriorating.
132. As set out in the problem definition, household credit growth and house prices have been increasing from levels that are already elevated, with the willingness of banks to approve high-LVR loans also having increased. The Reserve Bank believes these developments make the financial system less efficient, and pose a threat to future financial stability. They may also increase the severity of an eventual downturn by undermining the capacity and willingness of banks to continue to lend to creditworthy borrowers.
133. Step two considers whether a macro-prudential intervention is warranted or whether other economic policy responses might be appropriate. The other policy options available to the Reserve Bank are adjustments to monetary policy and/or micro-

¹⁶ RBNZ (2013c) provides more information about each of these steps.

prudential policy settings. Both of these are discussed in the “Problem definition” section.

134. Growth in credit and asset prices could be managed by a tightening in monetary policy. However, house price increases are not currently feeding into inflation and current monetary policy settings are thus broadly appropriate. Therefore, the Reserve Bank considers macro-prudential intervention is warranted.
135. The Reserve Bank has reviewed its micro-prudential capital requirements on residential mortgage lending and is increasing these capital requirements (refer to option one), which will increase the resilience of internal models banks in respect of high-LVR residential mortgage lending. While these adjustments will help to address bank resilience, they are not expected to have a significant braking effect on growth in credit and house prices. They will also not support the banks’ capacity to continue to lend through a downturn. The Reserve Bank does not consider that option one provides material benefits in terms of increasing the soundness and efficiency of the financial system, beyond that which comes from ensuring the calibration of the capital requirements is appropriate.
136. Given that the Reserve Bank considers that current monetary and micro-prudential policy settings are appropriate, it believes that macro-prudential intervention is warranted in the interests of reducing the risks of a more severe economic and financial downturn in the future that could arise due to further increases in household debt and house prices. There will also be efficiency gains from leaning against the housing cycle. Although house price growth and credit demand are not at the levels seen during the last housing cycle, macro-prudential instruments need to be employed pre-emptively, *before* system-wide risks develop. House prices and debt are rising from elevated levels, and it is expected that they will continue to rise.
137. Had macro-prudential tools been available during the last housing cycle, the Reserve Bank considers, with the benefit of hindsight, that many of the measures of systemic risk now employed as part of the macro-prudential framework would have signalled growing system imbalances and vulnerabilities at that time. Indeed, Hunt (2013) indicates that there was a case for macro-prudential intervention from 2005 onwards.
138. Step three involves selecting an appropriate macro-prudential instrument.
139. As noted in the ‘Objectives and assessment criteria’ section of this RIA, the Reserve Bank’s primary goal from taking action at this time is to help dampen the threat of excessive housing credit growth and house price inflation, to counter future instability in the financial system that could arise from unsustainable increases in housing credit and house prices. The recent increase in the share of high-LVR lending is likely to be contributing to house price inflation, and is increasing the potential adverse impact of a fall in house prices on the financial system and the wider economy. Moreover, unlike alternative macro-prudential tools, such as SCRs, restrictions on high-LVR residential mortgage lending have scope to both materially dampen excessive house price growth and, to a lesser extent, improve resilience. Therefore, the Reserve Bank has concluded that option three – restrictions on high-LVR lending – is the preferred option.
140. The Reserve Bank recognises that restrictions on high-LVR lending will impose costs in the short run, which include implementation costs and on-going compliance costs on banks, wider economic costs from reduced credit growth and potential welfare costs for those who are temporarily prevented from borrowing for a house purchase. These costs cannot be accurately quantified.

141. The Reserve Bank also acknowledges that experience with LVR restrictions in developed countries is relatively limited. However, there is evidence from the international literature that LVR restrictions can be effective at reducing house price and credit growth.
142. Overall, the Reserve Bank considers that individual short term welfare costs of excluding some borrowers are outweighed by an aggregate long term welfare gain from curbing excessive house price appreciation. There are also significant long-run benefits to the wider economy of minimising the impact on the financial system, and on financial stability, of a house-price correction.

Implications for monetary policy

143. Clause 1 of the MOU with the Minister of Finance requires the Reserve Bank to consider the implications for monetary policy of the implementation of any macro-prudential policy.
144. LVR restrictions will have implications for monetary policy. The Reserve Bank is concerned that, unabated, the housing market could also become an issue for price stability through the broader effect of rising house prices on aggregate demand. In the last housing cycle, the OCR was raised by 325 basis points, largely reflecting the inflation pressure generated from momentum in the housing sector. This rise in interest rates contributed to substantial upward pressure on the New Zealand dollar. To the extent the use of LVR restrictions assists in dampening momentum in the housing market, it may reduce the need for a monetary policy response thereby helping to mitigate the likely economic effects of a higher exchange rate.

Consultation

145. In March 2013, the Reserve Bank consulted on the first phase of its review of bank capital adequacy requirements for housing loans. This led to the decision, outlined in option one, to increase the risk weights on high LVR housing lending by internal models banks. Further consultation will be undertaken later in 2013 on phase two of this review, which will include consideration of the overall calibration of banks' capital for housing loans, and the relativity between the capital requirements for standardised and internal models banks.
146. The Reserve Bank publicly consulted on its macro-prudential policy framework, including options two and three in this RIA, in March and April 2013. The consultation paper was released on the Reserve Bank website, accompanied by a press release. At the same time, the Reserve Bank also released a background paper setting out the likely impact of the proposed instruments on the proposed objectives of building financial system resilience and reducing extremes in the financial cycle.
147. The submissions received in response to the consultation paper were considered when developing the proposals set out in this RIA. Twenty-seven responses were received, including responses from the public, registered banks, and other interested parties.¹⁷

¹⁷ A summary of submissions to the macro-prudential consultation, and the Reserve Bank's response, is available on the Reserve Bank's website: http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/5270348.pdf

148. The Reserve Bank also consulted on a technical framework for imposing restrictions on high-LVR residential mortgage lending (option three) in June and July 2013. The consultation paper, a draft Banking Supervision Handbook document “Framework for restrictions on high-LVR residential mortgage lending” (BS19), and draft changes to the “Statement of Principles” (BS1), were released on the Reserve Bank website.
149. The Reserve Bank received 20 submissions to this consultation. In response to a number of issues raised by submitters, the Reserve Bank sought further information from banks, which it used when calibrating its proposals. This consultation resulted in some changes relating to pre-approvals, small lenders, avoidance, and the scope of the application of the policy to overseas incorporated banks. A summary of the submissions received, and the Reserve Bank’s response, is available on the Reserve Bank’s website.¹⁸
150. As required by the Memorandum of Understanding between the Minister of Finance and the Governor of the Reserve Bank, the Reserve Bank has also consulted with the Minister and the Treasury on the use of macro-prudential tools to address emerging risks in the financial system.

Implementation

151. Registered banks will receive two weeks’ notice of a decision to introduce new LVR restrictions or, in the future, to vary (including remove) pre-existing restrictions. This notice period is limited in order to limit the ability of lenders and borrowers to avoid the restrictions.
152. LVR restrictions will be introduced 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.
153. Implementation of this restriction requires some pre-positioning by the banks, so that they are able to adjust their lending practices in accordance with the restriction at short notice. For this reason, the Reserve Bank has already consulted on a framework, including conditions of registration and a draft Banking Supervision Handbook document, for imposing restrictions on high-LVR residential mortgage lending (see the ‘Consultation’ section above).
154. This consultation highlighted the extent to which banks pre-approve their residential mortgage lending, and the difficulties that will create for some banks in meeting the restriction from the outset. When the restriction is first introduced, the initial period over which compliance is measured will be lengthened to six months to allow banks to manage their existing pre-approvals.
155. The restriction will apply for a limited period of time. Banks will be given at least two weeks’ notice of the Reserve Bank’s decision to remove the restriction.

¹⁸ A summary of submissions to the LVR consultation, and the Reserve Bank’s response, is available on the Reserve Bank’s website:
http://www.rbnz.govt.nz/regulation_and_supervision/banks/banking_supervision_handbook/5397073.pdf

156. The Reserve Bank's costs in performing its functions in relation to this policy will be met through its Funding Agreement under the Act.

Monitoring, evaluation and review

157. The Reserve Bank currently monitors macro-prudential indicators, including household indebtedness and debt servicing burdens, the level of banks' high-LVR lending, and a range of metrics on house prices, sales, and other housing market activity. It is currently working with banks to increase the quality and quantity of data to assist in the monitoring of these indicators.
158. Following implementation of an LVR restriction, the Reserve Bank will monitor both compliance with the restriction and the effect of the restriction. As the restriction will be imposed as a condition of banks' registration, compliance monitoring will fall under the Reserve Bank's prudential supervision framework.
159. To monitor the effect of the restriction, the Reserve Bank will assess the flow of residential mortgage lending by banks, and changes to aggregate household credit growth and house price growth.
160. Disintermediation and avoidance will also be monitored. The Reserve Bank compiles and monitors statistics on lending by non-bank lenders, which it could use to measure disintermediation through most domestic intermediaries. Informal channels of disintermediation will be more difficult to formally observe. Therefore the Reserve Bank will also need to use anecdotal sources, such as feedback from banks, mortgage brokers, and real estate agents, to detect lending not elsewhere captured by formal statistics. The Reserve Bank will also be monitoring lending flows for signs of avoidance by banks.
161. If disintermediation or avoidance activity undermines the effectiveness of the policy, then the Reserve Bank will consider whether the calibration or scope of the policy needs adjustment, which could include, in the case where efficiency costs were outweighing the benefits of the policy, removing the restriction, or applying it more broadly or rigorously.
162. The Reserve Bank will continue to advance its work on the other macro-prudential instruments. At some point the Reserve Bank may conclude that an alternative approach, or an approach that combines LVR restrictions with other tools, is appropriate.

Release of restriction

163. As noted above, LVR restrictions are intended to be a *temporary* measure used in response to rising financial system risks. Therefore the Reserve Bank will also assess when it is appropriate to remove a restriction. This will involve on-going monitoring of the indicators noted above for signs that systemic risks have dissipated sufficiently.
164. One scenario that could trigger the removal of LVR restrictions is a 'soft landing' in the housing market, where house price growth moderates without resulting in a sharp correction. In this situation, the Reserve Bank would need to carefully weigh the efficiency benefits of removing the restriction against the possible risk that this might stimulate an overly aggressive return of risk appetite to the market. A persistent moderation in household credit growth or improved mortgage lending standards would argue in favour of removal.

165. Alternatively, the removal of LVR restrictions could be triggered by a sharp correction in house prices. Here there is a clearer case for promptly removing any restrictions, given that there is little risk that any removal would result in overly buoyant risk appetite, assuming lending would tighten in a downturn. There is strong evidence that having an LVR restriction in place during the boom period strengthens the resilience of the financial system, but it is unlikely that the removal of LVR restrictions would have a significant impact in the midst of a correction in house prices.

Appendix A

International experience with SCRs

Table A1: SCRs – selected country experiences

Country	Year	Description
Australia	2004	Risk weights on low-doc housing loans were tightened.
Brazil	2010	Higher capital requirements for some consumer lending with long maturities and high-LVR.
Bulgaria	2010	Risk weights on housing loans reduced to address stagnant growth.
Croatia	2005	Risk weight on loans to debtors with currency mismatch increased by 25%.
Estonia	2006	Risk weight on housing loans increased from 50% to 100%
India	2004-2010	Risk weights on housing loans increased from 75% to a 50-125% range.
Ireland	2006	Risk weights on housing loans increased for the portion of loan exceeding 80% LVR, from 50% to 100%.
Malaysia	2005	Risk weights on non-performing housing loans increased from 50% to 100%.
Norway	1998-2001	Risk weights on housing loans above 60% LVR increased from 50% to 100%.
Poland	2008-2012	Differentiated risk weights for FX mortgage lending (75% versus 35% for zloty lending) in 2008, reduced in 2010. Risk weights on all FX loans increased June 2012 from 75% to 100%.
Spain	2008	Risk weights on housing loans increased for loans over 95% LVR.
Thailand	2009-2011	Risk weight for high-value housing loans (above 10 million baht) with LVR above 80% increased in 2009. Risk weights on housing loans less than 10 million baht with LVR above 90% increased in 2011.
Uruguay	2005	Risk weights for FX loans increased.

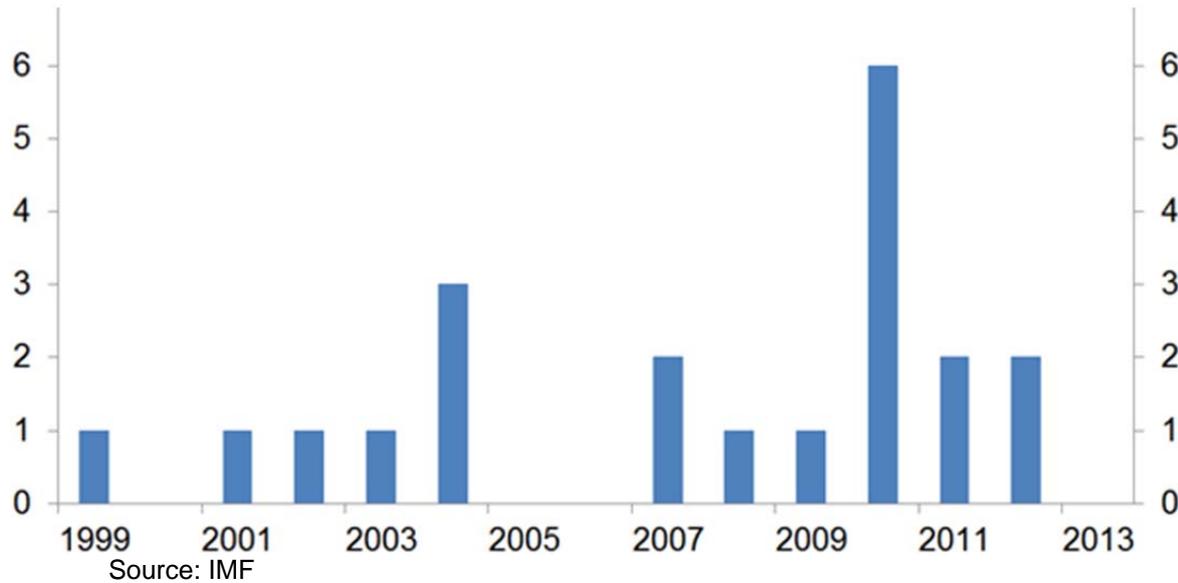
Source: Crowe *et al* (2011), Andersen, Johansen and Kolvig (2012), Lim *et al* (2011).

Appendix B

International experience with LVRs

Several countries utilise LVR limits, with some Asian countries having actively used them since the 1990s to respond to developments in the real estate market. They have increasingly been adopted during the post-crisis period. Figure B1 shows adoption of LVR restrictions since 1999.

Figure B1: Countries adopting LVR restrictions



The type of LVR varies considerably by country. Some examples of LVR restrictions are set out in table B1.

Table B1: LVR restrictions – selected country experiences

Country	Year	Description
Canada	2008	Max LVR of 80% for non-insured mortgage lending. Govt mortgage insurance not available above 80% for investors or refinancing, and 65% for revolving mortgages.
Hong Kong SAR	1995	Introduced 70% cap as regulation in 1995, and higher cap for insured FHBs in 2001. From 2009, tightened the cap for high-value and non-owner occupied housing.
India	2010	80% LVR limit.
Israel	2012	70% LVR limit for owner-occupiers; 75% LVR limit for FHBs; 50% LVR limit for investors.
Malaysia	1995, 2010	60% LVR limit from 1995-1998; 70% LVR limit lending for third homes introduced in 2010.
Netherlands	2011	Maximum LVR of 112%, with the portion exceeding 100% being redeemed in 7 years.

Singapore	1996	90% LVR limit, reduced to 80% in 2010; in 2010 also introduced a limit of 70% LVR for borrowers with multiple homes, reduced to 60% in 2011.
South Korea	2002	60% LVR limit; this has since been tightened four times, and loosened twice. Restrictions are very targeted. Eg according to the district, price of the property and financial institution.
Thailand	2003	LVR cap of 95% for low-rise residential properties and 90% for condominium units below THB 10 million; 70% over THB 10 million.
Sweden	2010	85% LVR limit

Source: Lim, et al (2011)

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