

**MEMORANDUM FOR** Macro-Financial Committee  
**FROM** Lamorna Rogers  
**DATE** 13 November 2012  
**SUBJECT** **Loan-to-value restrictions as a macro-prudential tool**  
**FOR YOUR** Discussion

---

## Executive summary

1. Loan-to-value ratio (LVR) restrictions have been identified as a potential tool in the Bank's macro-prudential toolkit. LVR restrictions could be applied in times of excessive housing credit growth, with the primary objective being to increase the buffers available to the financial system, either through raising the amount of collateral held against high-LVR housing lending, or raising capital requirements. An additional benefit is that LVR restrictions could dampen housing market demand at the margin, potentially weighing on housing credit growth and house price appreciation. LVR restrictions might also dampen lending via the signalling effect.
2. This paper reviews three options for restricting the flow of high-LVR lending a) imposing limits on loan-to-value ratios for housing lending b) requiring additional capital on high-LVR lending c) quantitative limits on high-LVR lending.
3. We find that LVR limits and higher capital requirements on high-LVR lending could both be useful additions to the Bank's macro-prudential toolkit.
4. By their nature, LVR limits are likely to be highly distortionary and are an impediment to the efficiency of the financial system. As such, it can be argued that other instruments, such as higher capital requirements, would be a preferable means of intervention during housing credit booms. However, the international evidence suggests that in some circumstances LVR limits are a more effective tool than higher capital requirements. As such, this 'second-best' instrument might sometimes be the 'least worst' choice when confronted with a potentially harmful housing boom. The distortionary nature of LVR limits suggests that their use should be restricted to extreme conditions and for limited periods of time.
5. We note the importance of linking the choice of instrument to the particular economic context, and that LVR restrictions would only be one possible choice in the policy toolkit. At times it might be best to deploy these instruments in combination with other policy tools; at other times it might be better to take a phased approach to restricting high-LVR lending.

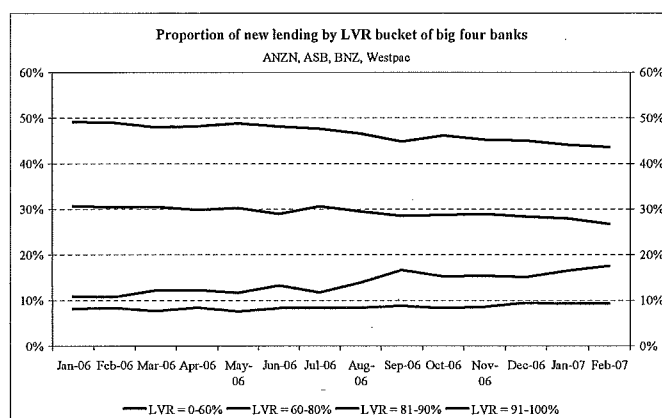
Higher capital requirements (a less distortionary measure) could be implemented initially, to be followed up by outright LVR limits if they are not successful in achieving the desired policy objective.

6. We recommend that the Bank expand its systematic collection of data on high-LVR lending flows, which will be necessary for monitoring emerging risks in the bank's housing loan portfolios, and compliance with LVR-based requirements. We also recommend that the Bank extends its data collection:
  - a. firstly, to capture investor lending, given the close connection between speculative borrowing and cyclical risks in the housing market and the possibility that investor lending might require differentiated LVR restrictions,
  - b. secondly, to capture debt-servicing requirements, which have been shown to be an important indicator of borrower risk.
7. We note the risk of disintermediation when LVR restrictions are imposed via prudential requirements, and would welcome the committee's views on how real this risk is, in the New Zealand context.
8. We note also the political sensitivity of LVR restrictions, and the importance of political buy-in to macro-prudential usage of these types of tools.

## Introduction

9. The financial crisis has increased the Bank's focus on ways to build greater resilience into the financial system, and to dampen extremes in the credit cycle. Resilience is being increased both through stricter 'normal' prudential settings (in the form of changes to capital, lending and liquidity requirements), and time-varying 'macro-prudential' measures, which are aimed at creating additional buffers over the cycle that banks can draw down in times of stress.
10. Housing credit is an area that has seen periods of excessive credit growth in the past, and where it could be useful to have macro-prudential instruments that directly target cyclical excesses in the housing market. For example, prior to the financial crisis, strong housing credit growth and the rising indebtedness of New Zealand households raised concerns that the financial system was on an unsustainable trajectory. Lending standards also appeared to be easing, suggesting that the desire to chase market share was dominating lending strategies. The Bank was sufficiently concerned that it requested additional data on banks' lending by LVR, and warned that it was seriously considering using its prudential powers.<sup>1</sup> The data confirmed that there had been an increase in the share of high-LVR lending (Figure 1), with banks' lending policies also showing a relaxation of LVR and income requirements at the margin.<sup>2</sup>

**Figure 1**



11. Episodes such as this, where high-LVR lending has been associated with a build up of risk in the housing market, have increased interest in tools that directly constrain high-LVR lending during times of increasing systemic risk. Since the financial crisis, LVR restrictions have spread beyond emerging market economies, and are increasingly being adopted in advanced economies. This paper examines the merits of LVR restrictions as a macro-prudential tool to target high-LVR housing lending.<sup>3</sup> The paper draws on cross-country experience and identifies

<sup>1</sup> Refer Board paper "Post-MPS discussion with banks on financial stability", Financial Stability Department, April 2007, #2984380.

<sup>2</sup> Indicative DSR data collected from the major banks suggested that significant numbers of high-LVR loans were being written with little free cash flow. Refer MPC paper "Some material about the risks of the household mortgage portfolios", D. Hargreaves, December 2008, #3504995.

<sup>3</sup> Two notes on scope: a) this paper focuses on the use of *prudential* tools to address risks arising from high-LVR lending. This reflects a view that the risk of disintermediation, while real, is not high, and that

some of the issues that need to be considered in the New Zealand context. We compare and contrast the use of quantitative LVR restrictions with price-based measures.

## Loan-to-value ratios – what do we know?

12. The loan-to-value ratio is typically highest at mortgage origination, when the borrower takes out the loan and has yet to begin paying it off. Amortisation will generally see the LVR diminish over time in line with the amount of the outstanding loan; however, fluctuations in house prices can see substantial volatility in LVRs. When house prices rise, *inter alia*, LVRs on the existing housing stock will fall; when house prices fall, LVRs will rise. For new entrants to the housing market however, LVRs will be higher in a rising market, as their deposit will account for a smaller share of the house price.
13. High-LVR loans tend to be concentrated amongst first-home buyers, and low-income borrowers who find it more challenging to raise a substantial deposit. The lower equity in these loans means that should the borrower get into difficulty – perhaps due to becoming unemployed or some other adverse change in personal circumstances – the borrower has limited room to sell or refinance their way out of distress. Low or negative equity may also reduce the borrower's incentives to repay<sup>4</sup>, although in New Zealand (where borrowers cannot 'walk away' from their mortgage debts), impaired capacity to repay appears to be the key driver of mortgage defaults.<sup>5</sup>
14. Low equity also means that should the borrower default, the margin of collateral above the value of the outstanding loan is lower (or negative if the borrower is in negative equity), increasing the likelihood of losses to the lender. Reflecting this, high-LVR lending tends to be riskier, with a higher probability of default and loss given default than other housing lending. Existing prudential requirements for housing lending require extra capital against high-LVR lending for this reason (refer Appendix 1).
15. An increase in the share of high-LVR lending can reflect structural factors, such as an influx of first-home buyers to the market, perhaps due to increased housing affordability or to government incentives.<sup>6</sup> However,

---

prudential measures should be sufficient. *Non-prudential* avenues are touched on at the end of the paper but are broadly out of scope. b) the macro-prudential use of LVR restrictions for sectors other than housing (such as small business or agriculture) is outside the scope of this paper, notwithstanding that LVR restrictions on business lending to sectors such as commercial property or automobile finance have been used in a small number of countries.

<sup>4</sup> The equity model of default treats the choice to default as a put option. It depicts borrowers as defaulting rationally when they are in negative equity (BIS, 2008).

<sup>5</sup> Harrison & Matthew (2008) argue that New Zealanders' strong commitment to their family home; a psychological unwillingness to acknowledge a loss by crystallising it in a sale; and the fact that debts are not discharged if the lender forecloses on the security, are all factors that suggest New Zealand borrowers would continue to service a loan even when they have negative equity.

<sup>6</sup> In Australia, government grants to first-home buyers from late 2008 saw a pickup in first-home buyer activity, which was associated with an increase in the share of high-LVR lending (refer RBA Financial

less favourably, it can also indicate a relaxation in banks' lending standards associated with excessive risk taking.

16. For example, a housing credit boom will typically be characterised by an abundance of low-cost funding, strong growth in house prices and highly profitable lending. Risk will appear lower, with the collateral available to the banking system swelling in line with house prices, and banks will be competing to expand or maintain their market share. At such times it is not uncommon to see an erosion of lending standards, including an increase in the share of high-LVR lending.
17. For their part, borrowers may be incentivised to enter the market when house prices are rising. This could be for fear of being locked out of the market if house prices continue to appreciate, or for speculative reasons. Speculative entry to the housing market, where the borrower is relying on house price appreciation to service the mortgage (or sell the house on at a profit) was one of the features of the US housing crisis, and can be of concern from a financial stability point of view. Borrowers who are enticed into the market by rising house prices and buy near the peak are more vulnerable to falls in house prices, making it less likely that the lender will be able to recover costs in case of default.<sup>7</sup>

## **How might LVR restrictions increase the resilience of the financial system?**

18. One possible response to a surge in high-LVR lending is to introduce restriction on such lending. Restrictions on high-LVR lending would have two aims. The primary objective would be to increase the buffers available to the financial system, by increasing the average amount of collateral held against housing loans (i.e. reducing leverage). Lower leverage means that in the event of a housing market bust, the drop in house prices required to put the borrower in negative equity would need to be larger. This would potentially mean fewer defaults in the event of a bust, as more borrowers who are unable to service their mortgages would be able to sell their way out of trouble. Borrowers would also have a larger buffer that they could draw down through refinancing, to manage their way through periods of distress. As such, the buffer would extend the amount of time that a borrower could be out of work for example, while still managing to meet their debt repayments.
19. An additional benefit is that it would dampen housing market demand at the margin. LVR restrictions would screen marginal borrowers out of the system, including those that would qualify for a mortgage only on the assumption that the house could be quickly turned around. The pool of

---

Stability Review, March 2010 <http://www.rba.gov.au/publications/fsr/2010/mar/html/house-bus-bal-sheet.html>).

<sup>7</sup> 2010 data from the Household Expenditure Survey showed that new entrants in 2007 typically had a higher loan-to-value ratio than new entrants in 2010, despite the longer amortisation period on their loans. Refer MFC note "Household vulnerability to mortgage debt after the GFC", A. Dunstan, 29 June 2012, #4842649.

borrowers would be fewer, weighing on demand and potentially helping contain the boom. And for those borrowers for whom an LVR limit is a binding constraint, the limit would rein in the amount they would be able to spend, reducing the pressure on real estate prices.

20. LVR restrictions may also dampen lending via the signalling effect. Communication that emphasises the risks attached to high-LVR lending (particularly if house prices were to fall), would send a strong public message about our unease around such lending, the more so if backed up by a credible threat of LVR restrictions. And the process of meeting the supervisory requirement around high-LVR lending could also help sharpen banks' focus on emerging risks around lending standards.

## Options for targeting high-LVR lending

21. Measures for targeting high-LVR lending can be split into two categories: credit-related measures and capital-related measures (to use the IMF terminology). Credit-related measures include outright LVR limits and quantitative restrictions on high-LVR lending. These have typically been favoured by emerging market economies and others with limited capacity to rein in excessive credit growth via monetary policy. However, these measures are also becoming increasingly popular in advanced economies, with Canada, Sweden, Norway (and recently Israel) all introducing LVR caps since the financial crisis (Refer Appendix 2 for a summary of cross-country LVR measures).<sup>8</sup> Capital-related measures require extra capital to be held against high-LVR lending, providing an indirect, price-based control. They have been relatively more common in advanced economies, including Ireland, Israel, Spain and Norway.
22. 'Credit-related' measures have the advantage of directly targeting high-LVR lending, and are simple and transparent. They limit the amount of high-LVR lending flowing into the system, thus increasing equity buffers for borrowers and lenders. However, a hard-edged implementation of LVR limits together with a uni-dimensional assessment of borrower risk – which ignores important dimensions such as capacity to repay, amortisation or tenor – risks screening "good" borrowers out of the market as well as "bad" borrowers. [REDACTED] 9(2)(d) and 9(2)(g)(i).
23. 'Capital-related measures', such as higher risk weights, have the advantage of leaving the lending decision in the hands of the banks. Banks are able to continue high-LVR lending but they have to set extra capital aside, which provides an additional buffer in case of default. Where higher capital requirements result in higher lending costs, they may weigh on credit growth. However, in times of a credit boom, when lending spreads are compressed, this channel may be less effective.
24. Table 1 provides a comparison of the various types of LVR restrictions, by transparency, effectiveness, efficiency and coverage. This is followed by a more detailed overview of the various options.

<sup>8</sup> See also details by country of on LVR restrictions, including background and motivations, actions and other macro-prudential tools used in combination. MFC background paper "Cross-country evidence on the use of LVR restrictions", 13 November 2012, #5022521

**Table 1: Comparison of different types of LVR restrictions**

	Transparency	Effectiveness	Efficiency	Coverage
<b>a. Limit on loan-to-value ratio</b>	Strong signalling advantages and more transparent than capital-based restrictions; likely to be politically controversial	Some evidence that effective in dampening credit growth and house price appreciation; not found to be effective in reducing leverage (building buffers); may need fine-tuning to remain effective over time	Efficiency (and potentially social/equity) costs as impedes flow of funds from borrowers to lenders; trade off between stability and other public policy goals will be difficult to calibrate; costs can be mitigated via targeted implementation, but will increase regulatory and administrative burden and diminish effectiveness	Risk of avoidance and regulatory arbitrage; benefits of avoidance/disintermediation will be lower where implementation is not "hard-edged"
<b>b. Higher capital requirements on high-LVR lending</b>	Limited 'signalling' benefit; may still be controversial given banking sector lobbying	Effective in building capital buffers; not found to be effective in dampening credit growth or house price appreciation	Lower efficiency costs than LVR limits but may displace risk; correct calibration challenging	Lower risk of avoidance and regulatory arbitrage than LVR limits
<b>c. Quantitative restrictions on high-LVR lending</b>	Some signalling advantages; likely to be politically controversial	Unknown quantity; may help dampen credit growth	Lower efficiency costs than LVR limits	Lower risk of avoidance and regulatory arbitrage than LVR limits

### Option A: Limit (cap) on loan-to-value ratio

25. LVR limits are the most popular form of LVR measure, and work by setting an LVR threshold for lending. New loans (and/or refinancing) are prohibited above this threshold, with the threshold typically set in the 80 – 90 per cent zone for advanced economies. Thresholds may be substantially lower in emerging market economies however: in China, LTV limits of 50 per cent are applied for purchases of second homes.

#### *Transparency/accountability*

26. LVR limits are highly visible and easily understandable for the general public, maximising transparency and signalling effects. They would help underline the seriousness of authorities' concerns regarding housing market developments, and the risk of a disorderly correction, which could see borrowers pushed into negative equity.



27. The other side of the coin however is that they may be intensely controversial, given that they directly limit the lending and borrowing decisions of private sector agents, and that LVR limits tend to be more binding for some groups than others e.g. low-income and first-home buyer households. This can be exacerbated in the case where the macro-prudential authority is the central bank, given that credit allocation is generally more the territory of finance ministries than central banks, and that it increase the concentration of powers in the hands of the central bank.
28. As such, imposition of LVR limits (particularly where the mandate of the macro-prudential authority is ambiguous) carries some reputational risk. IMF and BIS studies have underlined the importance of the macro-prudential authorities having a clear mandate, and appropriate governance and accountability frameworks.

### *Effectiveness*

29. An IMF study finds that most countries that use LVR limits do so with the objective of dampening credit growth, with a number of Asian countries also aiming to curb house price inflation and limit the banking system's exposure to real estate (IMF, 2011a). More recently, a number of countries have been motivated by a desire to reduce household indebtedness. In Central and Eastern Europe, reduction of currency risk has also been a common motivator, with LVR measures tailored to target foreign currency housing lending.
30. The same IMF study finds that countries that have implemented LVR limits typically self-assess them as effective. It also found that credit growth and asset price inflation declined following the introduction of LVR limits in more than half of sampled countries, and that LVR limits reduced the procyclicality of credit growth. However, LVR limits were not found to be effective in addressing the risks arising from excessive leverage (increasing financial system buffers), with no statistically significant relationship found between LVR limits and leverage. The IMF has also released a number of papers dealing with real estate booms. Maximum LTV limits are found to be positively associated with house price appreciation, suggesting that a 10 percentage point increase in maximum LTV allowed by regulations is associated with a 13 per cent increase in nominal house prices (IMF, 2011b). Hong Kong and Korea are cited as countries where the introduction of LTV limits saw an immediate reduction in house price appreciation, although this diminished subsequently.<sup>9</sup>

### *Efficiency*

31. LVR limits come with significant efficiency costs, given that they can screen out "good" borrowers as well as "bad". Where LVR limits are implemented in isolation from other aspects of lending standards, they risk screening out borrowers who have little equity but good repayment capacity, and letting through some "bad" borrowers, who have the

---

<sup>9</sup> See also Wong et al, 2011.

required deposit but don't have the capacity to service the loan over its full term.

32. Focus on one aspect of lending standards also risks undermining attention to other important aspects, such as debt-servicing capacity, tenor etc. The Financial Stability Board has called for a holistic approach to lending standards, which recognises the multiple and interrelated dimensions of lending standards, and the need to apply them in a coordinated, balanced fashion (FSB, 2012).
33. Reflecting these types of concerns, LVR limits are typically not implemented in isolation. An IMF study noted that fifteen of the surveyed countries used LVR limits in conjunction with other measures (often some type of debt-servicing limit) compared to five that used them alone. Using macro-prudential instruments in combination provides a greater assurance of effectiveness by tackling risk from various angles, but it also implies a higher regulatory and administrative enforcement burden.
34. A downside of LVR restrictions is that they can have significant equity and social impacts, given that high-LVR buyers tend to be low-income and young (first-home buyers are predominantly under 35). Moreover, LVR restrictions may also disrupt the availability of finance to small business owners who take out high-LVR loans to finance their businesses, potentially undermining economic activity and investment. This has seen a number of countries tailor their LVR measures in an attempt to lessen these costs.
35. For example, in Hong Kong, borrowers are able to borrow above the normal LVR threshold if they take out mortgage insurance, and meet eligibility requirements (i.e. debt-to-income, loan size, tenor), or if they meet stringent net worth requirements. The HKMA argue that the subsequent significant take up of lenders' mortgage insurance (LMI) shows liquidity constraints (locking out otherwise good borrowers) were a real concern. They also note that LMI loans have lower default rates than others, implying that permitting such loans at high LVRs has not compromised banking stability. In Canada, LVR limits are lower for refinancing, cash out and investment property loans, while Israel has a higher LVR cap for first-home buyers, and lower for investment property loans.
36. Targeted LVR measures can also be used to focus on particular sectors where housing credit growth is deemed excessive. Hong Kong, Malaysia and Singapore apply tighter LVR limits for luxury and speculative investments for example, while Korea applies LVR limits based on whether the property is located in a speculative zone.

### *Coverage*

37. Potential issues with LVR limits include avoidance and regulatory arbitrage.

### *Gaming*

- Banks might choose to 'game' the restrictions, by reclassifying loans so that they are not affected. An example could be reclassification of small business lending that is collateralised against residential property from housing lending to business lending. While this could see some leakage, the adverse impact would likely be small given that a) retail borrowers are the primary target b) high-LVR secured lending to small business only makes up a small component of housing lending c) there are reasons why this type of lending should be classified as business lending anyway.

#### *Avoidance through unsecured lending*

- Banks might choose to lend secured up to the LVR threshold, and extend some form of unsecured or subordinated loan to make up the difference above the LVR limit. In Sweden, the implementation of LVR limits has seen an increase in unsecured lending. However, the regulators appear relaxed about this, noting that the share of unsecured loans that are related to loans for housing purposes is very small and that borrowers must meet very high requirements if they are to be granted a loan exceeding 85 per cent of the loan-to-value ratio.<sup>10</sup>
- It may also reflect a view that unsecured lending is more expensive anyway, so the restrictions still achieve the objective of exerting downwards pressure on credit demand and credit growth (Soulтанаeva and Nordberg, 2010). RBNZ analysis of the potential cost of unsecured borrowing above an 80 per cent LVR threshold suggested the additional costs could range between 54 basis points (85% LVR) and 215 basis points (100% LVR) (Ha and Hodgetts, 2011).

#### *Regulatory arbitrage*

- LVR limits that only apply to the banking sector leave the field open for other players such as foreign banks or non-bank deposit takers to offer high-LVR lending. To the extent that these agents are outside the core banking system, the core system would remain protected by lower leverage (the primary objective of LVR limits), but their activities could work against any potential dampening effects on credit growth or household indebtedness (as the pool of borrowers would be higher than in the case of LVR limits that are binding across all lenders). There would also be level playing field considerations, with locally regulated banks unable to compete for high-LVR business.
- These were amongst the key considerations in Ireland's light handed approach to reining in the Irish housing boom prior to the

<sup>10</sup> Report on "The Swedish Mortgage Market", Swedish Finansinspektionen, 13 March 2012, available at [http://www.fi.se/upload/90\\_English/80\\_Press\\_office/2012/bolan2011\\_eng.pdf](http://www.fi.se/upload/90_English/80_Press_office/2012/bolan2011_eng.pdf)

financial crisis.<sup>11</sup> In hindsight, the Irish authorities note that competitiveness risks were “overstated considerably”, with key elements underlying the argument not being addressed systematically. These included: the relative importance and market power of existing Irish-regulated institutions; the ease of entry of other institutions; the potential loss in competitiveness facing “home” institutions; and finally, the possibility of exploring with other national regulators a co-ordinated regulatory response. The authorities further note that “if, as a result of more aggressive intervention, Irish-regulated institutions had ceded some of their property lending activities to others, their own situation today could have been considerably stronger. The possible costs of inappropriate lending by others would have been the responsibility of the regulator of the other jurisdiction rather than of the Irish authorities”. The authorities conclude that the excessive weight given to this concern probably reflected lobbying objections from institutions who feared losing market share (Central Bank of Ireland, 2010).

- Evidence as to whether regulatory arbitrage is a real issue in practice is mixed: in Korea, there was some shift of activities beyond the banking sector, and the authorities extended the regulatory net to capture this. In Canada, LVR limits are applied via lending standards around mortgage insurance, which is compulsory for all high-LVR lending by federally-regulated institutions. Limits have been in place since 2008, suggesting sufficient time for disintermediation to take place, but there is no obvious evidence of such a shift. This may partly reflect the targeted nature of the restrictions, which allow first-home buyers LVRs up to 95 per cent (with mortgage insurance) compared to an 80 per cent limit for refinancing and investor loans.

38. The evidence also suggests that policy measures that are in force over longer periods are likely to diminish in effectiveness as agents work out how to circumvent them. This highlights the importance of ensuring that LVR limits are only used in extreme circumstances, for limited periods.

---

<sup>11</sup> Others included a fear that more robust regulation might make Ireland less attractive for international financial investment, and that some forms of intervention might run counter to the prevailing “principles-based” philosophy of regulation.

### Option B: Higher capital requirements on high-LVR loans

39. Higher capital requirements are applied to loans above a particular LVR threshold, and can take the form of a ratio or risk weights, or a capital overlay. The most common method is higher risk weights.

#### *Transparency/accountability*

40. Capital requirements are less transparent than LVR limits, and thus have lower signalling benefits. They are likely to be less publicly controversial than LVR limits, but could still be controversial where the banking sector actively lobbies against their imposition. Again, it will be important that the authorities have a clear mandate and appropriate governance arrangements.

#### *Effectiveness*

41. IMF data suggest that countries that use capital-related LVR measures do so with the objective of dampening credit growth, with many also having the objective of building financial system buffers. While higher capital requirements will by definition succeed in creating additional buffers, evidence regarding the relationship between higher capital requirements and credit growth is ambiguous. As discussed in Box A, increases in capital requirements will not necessarily raise the price of lending, a key channel for influencing credit growth.

#### **Box A: The link between higher capital requirements and the price/quantity of lending**

A potential advantage of capital-related LVR measures is that the higher cost of capital could result in a higher price for lending, thereby dampening lending demand and excess credit growth. However, as outlined by Harrison & Hoskin (2008), there are a number of reasons why regulatory changes to capital requirements might have little or no impact on the price of lending.

Firstly, where banks hold capital that is already comfortably above regulatory requirements, an increase in regulatory requirements may have little or no impact. In New Zealand, the locally regulated banks already hold aggregate Tier 1 capital of around 11 per cent of risk-weighted assets, compared to a Basel III regulatory requirement of 8.5 per cent. Of course, if the increase in regulatory requirements substantially reduced the banks' regulatory buffer, there could be some impact if this was viewed adversely by credit rating agencies.

Secondly, banks' internal pricing models are primarily driven by their cost of funds, assessment of the riskiness of the loan, and competitive positioning. Where banks utilise their own internal models of economic risk rather than regulatory models of risk, a change in the regulatory risk requirements may not flow through to the pricing model. Even where changes in regulatory risk assessments fully flow through to the bank's

own pricing model, the increased margins are unlikely to greatly impact on lending. If a bank targets 15 per cent return on Tier 1 capital (compared to funding), a 25 percentage point increase in risk weights would increase the spread on that lending by around 32 basis points ( $.15 \cdot .25 \cdot .085$ ). This is a relatively small increase in the scale of a typical OCR cycle.

Finally, any increase in spreads might be outweighed by cost of funds and competitive considerations. This is arguably more likely in times of excessive credit growth – which is one of the criteria for applying LVR restrictions – when funding margins are typically compressed and banks are competing intensely for market share.

It is difficult to identify the impact of historical risk weight changes on lending spreads in New Zealand. In aggregate, easing risk weights via Basel II were coincident with some compression in net interest margin, but it is not clear this is causal. Similarly, while anecdotal evidence suggests that farm lending spreads have increased (and conditions tightened) since 2009 – when banks were informed that risk weights on agricultural lending would be increasing – it seems unlikely that higher risk weights were the driving force behind the tightening in lending standards.

OIA s18(c)(i), refer s105 RBNZ Act

Figure A1 shows contributions to semi-annual agricultural lending growth for the major lenders to the agricultural sector. There is no obvious correlation between the implementation of higher capital requirements for agricultural exposures in mid-2011 and reduced lending growth. At the aggregate level, lending broadly stabilised and then picked up in April 2012, with the individual banks showing very different strategies.

OIA s18(c)(i), refer s105 RBNZ Act

42. Following on from this, the evidence around effectiveness is mixed: Norway used higher risk weights for high-LVR loans in the late 1990s to curb credit growth and rising house prices, but chose the path of LVR caps in 2010, when confronted with rising household debt and lax lending standards.<sup>12</sup> Similarly, Israel is currently implementing differentiated LVR caps, in addition to capital-related LVR measures which it implemented in 2010. Ireland used LVR-based risk weights in 2006 with little effect: implementation of higher risk weights was seen as “too little, too late” (Central Bank of Ireland, 2010). By the time risk weights were applied, the boom was close to its peak and it was too late to build up effective buffers for the banking system. It also reflected calibration problems, with the size of the risk weights imposed only translating to a 2.25 per cent Tier 1 capital requirement for 100 per cent mortgages compared to 2 per cent before. The Irish experience highlights the importance of early intervention, and the difficulties in calibrating the size of the intervention.
43. IMF cross-country findings on the effectiveness of capital-related measures are also mixed, with interpretation complicated by the fact that the studies evaluate the effectiveness of broadly applied countercyclical capital requirements, rather than LVR-based capital measures alone. The evidence on broad countercyclical capital measures suggests that they reduce leverage (creating financial system buffers) but do not dampen credit growth or house price appreciation (IMF 2011a, IMF 2011b).

### *Efficiency*

44. Higher capital requirements are likely to be less costly from an efficiency perspective, as they work through better aligning risk with capital requirements, allowing lending to continue in the high-LVR space.
45. The equity and social costs of capital-related restrictions are likely to be lower than outright LVR limits, given that banks will still be able to lend to low income and first-home buyers. However, where capital requirements result in a higher price of lending, some marginal borrowers will still be priced out of the market.

### *Coverage*

46. Many of the same issues exist regarding avoidance and regulatory arbitrage:
- However the incentive for such measures would be lower, given that lenders would still be able to engage in some high-LVR lending, thus providing competition for unregulated new entrants and reducing the benefits of avoidance. Indeed, as part of New Zealand’s Basel II implementation in 2008, micro-prudential requirements were introduced requiring higher capital on high-LVR lending (refer Appendix 1), with no evidence of consequent disintermediation.

---

<sup>12</sup> LVR caps are treated as guidelines rather than hard limits, with debt-to-income ratios also restricted, and banks able to lend above the ceiling subject to special soundness evaluations.

- Should higher risk weights see a shift in activity outside the regulatory perimeter, it could be more difficult to counteract this, given that extending the regulatory net might also require imposing some new form of capital requirement on these institutions.

47. Capital-based LVR measures are also less likely to be politically controversial than outright LVR limits, given that they target the lender rather than directly hitting particular borrower segments. Notwithstanding this, the imposition of higher capital requirements on the agricultural sector was highly politicised, with the farming lobbying making representations to the Minister of Finance. Further, where use of capital restrictions on high-LVR lending is seen as implementing LVR limits by stealth – a criticism raised in British submissions on such measures – it still carries some political risk.

#### Option C: Quantitative limits on high-LVR lending

48. Another possibility, but not something that has actually been used in practice, would be to set speed limits on high-LVR lending. These could take the form, *inter alia*, of restricting the share of high-LVR lending as a proportion of housing lending (either by stock or flow), placing a ceiling on the growth of high-LVR lending, or restricting high-LVR lending to a certain proportion of capital.

#### *Transparency/accountability*

49. Prudential requirements are less transparent than LVR limits, and thus have lower signalling benefits. They are likely to be less publicly controversial than LVR limits, but could still be controversial where the banking sector actively lobbies against their imposition. Again, it will be important that the authorities have a clear mandate and appropriate governance arrangements.

#### *Effectiveness*

50. Quantitative restrictions on aggregate housing lending have been implemented in some economies. For example, in 2009 Singapore capped banks' loan exposures to the property sector (excluding owner-occupier residential mortgages) at 35% of total non-bank exposures. And Poland introduced a foreign currency mortgage lending ceiling set at 50% of total mortgage lending in 2010. It is difficult to assess the effectiveness of these measures given that they were implemented as part of a suite of policy changes. Ireland used sectoral limits prior to adoption of the euro, but they fell into disuse, reflecting a perception that they were too easily evaded (Central Bank of Ireland, 2010).

#### *Efficiency*

51. High-LVR speed limits have similar efficiency concerns to outright LVR limits, although again they would be muted by the fact that banks would still be able to extend some high-LVR lending. However, lenders with



better risk assessment processes that allow them to undertake a higher share of LVR lending could arguably be penalised by such quantity-based restrictions, to the extent that they are restricted to the same high-LVR lending share/growth as their less efficient competitors.

### *Coverage*

52. Again, avoidance and disintermediation issues would be a concern, but as with option b, would likely to be less of a problem than LVR limits, for similar reasons.

Section 9(2)(g)(i).

## Policy considerations in the New Zealand context

54. The decision as to whether to apply LVR restrictions, and if so which ones, is necessarily context-dependent. The potential economic scenarios are many and varied, making one-size-fit all solutions impossible. However, some relevant considerations can be identified to help guide such decisions. Table 2 provides a summary by type of LVR measure, which is explored in more detail in the following section.

**Table 2: Comparison of LVR options for New Zealand**

	Mandate/ Accountability	Instrument choice	Monitoring	Calibration	Enforcement
<b>a. Limit on loan-to-value ratio</b>	Bank has mandate for financial system soundness, and powers to exercise LVR limits under Section 78(1) of the Reserve Bank Act; politically controversial but MoU will provide political buy-in	A better choice for countercyclical policy, and strong signalling effects; higher efficiency costs than other LVR-based instruments; may need to be implemented in tandem with other prudential restrictions, and/or targeted to mitigate efficiency/distributional effects	Would require regular data collection on housing lending flows by LVR; may be some disaggregated data requirements	Calibration may need to be ongoing to find binding threshold; may need more granular LVR reporting buckets	Application via prudential path could see disintermediation; where disintermediation risk judged to be high, may need to consider broader approaches
<b>b. Higher capital requirements on high-LVR lending</b>	In line with existing prudential powers; likely to provoke strong banking sector lobbying	A better choice for building buffers, but unlikely to be able provide to support to monetary policy, and limited signalling benefits; lower efficiency costs than LVR limits	Would require regular data collection on housing lending flows by LVR	Could be difficult to calibrate correctly; risk of "too little, too late"	Lower disintermediation/avoidance risks than LVR limits but may still see some leakage
<b>c. Quantitative restrictions on high-LVR lending</b>	Similar to option a) but less politically controversial	Potentially helpful in countercyclical policy; some signalling benefits	Would require regular data collection on housing lending flows by LVR	Calibration may be challenging	Risk of disintermediation/avoidance but lower than LVR limits

### *Mandate/accountability*

55.

9(2)(h).

- [REDACTED]
56. Note that imposing LVR restrictions under these provisions would require that the likely benefits for financial system soundness outweigh the efficiency costs.
57. The Bank is also currently negotiating a Memorandum of Understanding with the Minister of Finance that will pre-position the Bank for use of LVR limits, by providing political buy-in on the agreed instruments of macro-prudential policy.
58. Political buy-in is essential, given that LVR limits represent an extension of the Banks' powers that could see Bank taking a direct role in the credit allocation process (if only temporarily). The political sensitivity of LVR limits is obvious in the reaction to date to the Bank's inclusion of LVR limits as a potential tool in its macro-prudential toolkit.<sup>14</sup>
59. Pre-positioning of LVR limits is also necessary for timely imposition of LVR restrictions, and to reduce the risk of political interference at the time of instrument deployment.<sup>15</sup>

#### *Instrument choice*

60. LVR restrictions are an interference in the normal workings of the financial system, and as such should only be applied sparingly (both in terms of frequency and duration). The decision to apply (and remove) LVR limits would require a high degree of judgement, given the lack of data and experience in this area.
61. Necessary requirements would be that there is an excessive share of high-LVR lending (as reflected in above-trend lending and lax lending standards), and that excessive credit risk is judged to be building in the housing sector.
62. These would not be sufficient requirements however, as it may be that a sectoral macro-prudential response is not necessarily the most appropriate one, at least in the first instance:
- where LVR lending is being driven by a minority of financial institutions, a selective response that targets those institutions might be more appropriate,
  - in cases where there is substantial uncertainty around the real nature and size of risks, a better path might be to engage in

[REDACTED]  
9(2)(h).

<sup>14</sup> "Mortgage rule move will force buyers out", Sunday Star Times, 13 May 2012, available at <http://www.stuff.co.nz/sunday-star-times/latest-edition/6911543/Mortgage-rule-move-will-force-buyers-out>

<sup>15</sup> Refer MFC paper "Why might different governance arrangements be helpful for macro-prudential policy compared to micro-prudential policy?", L. Rogers, 19 July 2012, #4856883

intensive consultation with the banks on current lending standards and risk management, perhaps backed by intensified supervisory engagement where particular concerns are identified, and strengthened public communication on the risks attached to the housing market,

- even where there is a strong case for LVR restrictions, the use of moral suasion (either private or public) would normally be recommended as a first step, with the possibility of LVR restrictions providing a credible threat should the banks not modify their behaviour as desired,
- where aggregate credit growth is judged to be excessive and a countercyclical capital buffer likely to be applied, the additional imposition of LVR limits heightens prudential complexity. Complexity as a rule should be kept to a minimum, and might advise against the use of additional LVR restrictions in some circumstances.

63. The decision on the type of LVR restriction – in practice probably higher capital requirements or LVR limits – will need to balance competing considerations. The choice of instrument needs to clearly align objectives with likely effectiveness, and should minimise efficiency costs. Implementation issues will also be key.

64. The broad objective of the Bank's macro-prudential policy is to provide additional buffers to the financial system, with the hope that macro-prudential policy interventions may also help dampen extremes in the credit cycle. The balance between these objectives will depend on the prevailing economic and financial conditions.

65. The international evidence shows that risk weights are more effective at building buffers but tend to have little impact on credit growth. Conversely, there is some evidence that LVR limits help to dampen credit growth, asset price inflation and household indebtedness, but do not reduce leverage (increase buffers). LVR limits are a more popular measure, with twenty countries using them, compared to five countries that have used LVR-related risk weights. This may reflect the fact that surveyed countries that imposed LVR restrictions consistently had the goal of leaning against credit growth (for which LVR caps are more effective), while only some had the additional objective of building financial system buffers.

66. Efficiency, social and equity costs will be lower where intervention is less, as there will be less direct impact on credit allocation decisions. LVR restrictions can be thought of as occupying an intervention spectrum. At the lower end are the more market-based instruments, such as capital-based LVR-restrictions that operate by adjusting incentives; at the high end are blunt LVR limits. In between we find intermediate measures such as LVR speed limits, which impose controls but leave some discretion in the hands of lenders, and constrained versions of LVR limits which apply only to selected groups e.g. uninsured borrowers, refinancers.<sup>16</sup>

---

<sup>16</sup> Mortgage insurance should provide an effective buffer against idiosyncratic shocks; however in the case of a severe systemic shock as occurred in the United States, there is a risk that mortgage insurers

67. As noted earlier, a number of countries have chosen to implement LVR limits in such a way that higher LVRs are available to new entrants to the housing market, either by imposing differentiated limits or allowing high-LVR lending with mortgage insurance. The likely impact on first-home and low-income buyers would need to be evaluated, together with the case for some sort of targeted implementation (while recognising that targeting would likely reduce the effectiveness of the LVR policy).
68. The experience of Norway and Israel suggests that instrument choice may not be an “either/or” choice: in both cases LVR-based risk weights were used at one point, but more recently LVR caps have been used. The door may need to be left open to a phased macro-prudential policy intervention, with the first stage being weaker intervention in the form of higher capital requirements, followed by outright LVR caps in the second stage if the initial intervention is not effective.
69. A further decision around instruments is whether the LVR restriction should be implemented singly or in combination with other macro-prudential policy measures. Debt-servicing requirements are commonly used in combination with LVR limits, and would be an obvious candidate that would provide a broader targeting of risk.<sup>17</sup>

#### *Monitoring/operationalisation of LVR restrictions*

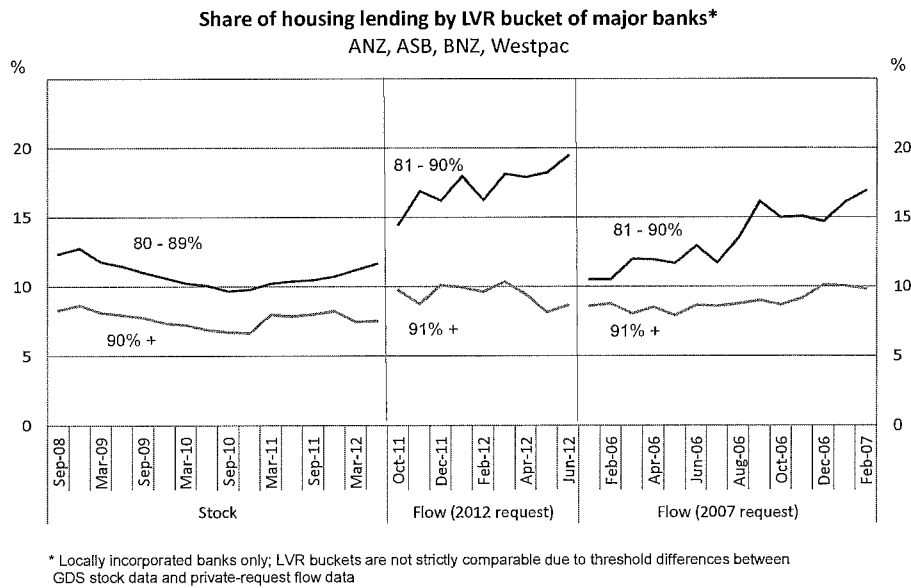
70. Operationalisation of LVR restrictions requires the ability to monitor banks’ high-LVR lending for risk assessment and compliance purposes. LVR restrictions imposed through conditions of registration would fall under the standard compliance framework, although this would likely need to be extended should active monitoring be required (rather than relying on market discipline).
71. Regular data on LVR lending are currently provided by both standardised and advanced approach banks as part of banks’ General Disclosure data on stocks of residential lending by LVR bucket (refer Appendix 1 for details). There have also been two ad hoc requests for flow data from the advanced approach banks (2007 and 2012).

---

do not have adequate capital to meet claims, or that they tighten their claims assessment criteria and refuse to meet claims (the UK experience in the 1990s). Given that macro-prudential policy is designed to increase the resilience of the financial system to systemic shocks, use of mortgage insurance to mitigate the blunt effect of LVR limits could be problematic.

<sup>17</sup> The FSB notes that “One of the most fundamental components of prudent underwriting is an accurate assessment of the borrower’s ability to repay the mortgage. This is important to help ensure prudent mortgage underwriting standards minimise defaults and losses, and thus, promote stability of the financial system. Furthermore, it is an important factor in reducing the likelihood of consumer over-indebtedness and the negative social and economic impact of forced sales.” (FSB, 2012)

Figure 2



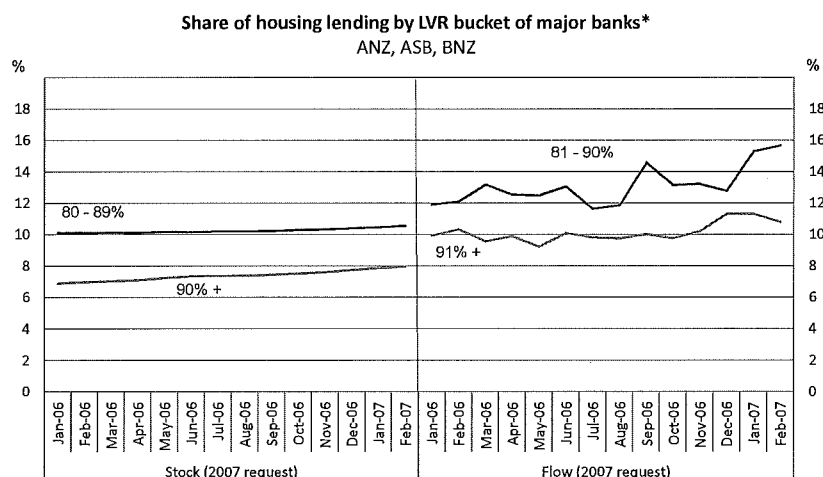
72. As can be seen in Figure 2, marginal changes in high-LVR lending are slow to emerge in the stock data, reflecting that these data incorporate both inflows (new lending and refinancing) and outflows due to pay down of debt plus revaluation effects.<sup>18</sup> In the most recent period, this may partly reflect the impact of household deleveraging.

73. In a period of fast rising house prices, there could also be little visible change in the stock of high-LVR lending, despite accelerated flows into high-LVR lending. This may have been the case leading up to the financial crisis, where an increase in flows of lending in the 81 – 90% LVR bucket saw little effect on (roughly) corresponding stocks in the 80 – 89% LVR bucket (Figure 3).<sup>19</sup>

<sup>18</sup> Note that there are some known issues with this data, particularly when Basel II was first implemented, as some banks had “missing LVR” accounts that they were required to treat as the highest LVR category. As data quality has improved, some of these may have migrated into lower LVR categories.

<sup>19</sup> House prices increased by around 14 per cent between the end of 2005 and March 2007.

Figure 3



\* Locally incorporated banks only; LVR buckets are not strictly comparable due to threshold differences between GDS stocks data and private request flows data

74. Effective monitoring will therefore require flow data on new housing lending by LVR bucket, and stock data to provide an overview of banks' exposures to high-LVR lending. Quarterly data should be sufficient for early identification of risks, intervention decisions and monitoring. Reporting buckets would need to be aligned with potential LVR thresholds, and may require more granularity than the 10 per cent intervals that are currently available.<sup>20</sup> Data would be combined with qualitative information such as the Credit Conditions survey, and liaison discussions, to help form a view on banks' lending practices.

75. Should the bank wish to tailor LVR limits by loan type (e.g. investor, refinancing etc) as has been done abroad, supporting data would also be needed. It would need to be considered whether data should be collected as part of banks' regular reporting, or whether some types of breakdowns might be better collected via dedicated surveys, as has been done in other jurisdictions. There is a strong argument for regular collection of data on investor lending, given the links between speculative housing investment and the housing cycle.

76. It would also be helpful to gather data on other aspects of lending standards such as debt-servicing requirements, although banks have quite different frameworks for assessing debt-servicing capacity, which could complicate standardisation.

### Calibration

77. Detailed work on the calibration of LVR tools is outside the scope of this document; however some broad points can be made.

78. For LVR limits, the appropriate thresholds would need to be identified. For convenience, this paper has focused on high-LVR lending as a group (above 80% LVR) but in practice, the risk attached to a 81% LVR loan

<sup>20</sup> Refer Appendix 1 for buckets.

and a 95% loan is very different, and this would need to be considered in developing the policy response.

79. A decision would also be needed on whether the limit should be broad-based or targeted:

- country experience suggests that the appropriate LVR threshold is typically found through trial and error, with countries often setting LVRs at a starting threshold then adjusting up or down to find the 'correct' setting. It may be necessary to design a framework which allows thresholds to be set at 5 per cent intervals e.g. >90 per cent, > 95 per cent etc.
- targeted limits are typically differentiated on borrower type (owner-occupier, investors, first-home buyer, refinance, equity withdrawal) and property type (location, value). Not all of these will be relevant in the New Zealand context.

80. For capital-related requirements, one approach could be to specify risk weights for high-LVR lending in the conditions of registration of the banks, or in the capital requirements documents (BS2A, BS2B). These would effectively 'carve out' risk weight calculations for loans above the LVR threshold, so that the higher risk weights would override the normal calculations.

81. At present, LVR risk thresholds differ between standardised and advanced approach banks e.g. an 80% LVR loan falls into the lowest risk bucket for standardised banks and into the second-highest risk bucket for internal model banks (Table 3). This complicates comparisons of LVR lending trends and effective capital requirements by LVR bucket across standardised and internal model banks. It could also complicate implementation of a standardised macro-prudential LVR capital requirement.

**Table 3**

<i>LVR</i>	<i>Standardised approach bucket</i>	<i>Advanced approach bucket</i>
80%	Does not exceed 80%	80% -89%

### *Enforcement*

82. Incentives for avoidance or regulatory arbitrage are likely to be lower where restrictions are not totally binding. Avoidance via use of unsecured lending to 'top up' the loan will reduce the impact of LVR restrictions but not negate it, given that the higher cost of this lending will impose some form of risk pricing, and dampen lending demand at the margin.

83. In some jurisdictions, manipulation of valuations has been an issue. This suggests that there would probably need to be some sort of requirement for an updated third-party valuation at the time of approving a housing



loan; the current move towards accredited valuers should be helpful in this regard.

84. Disintermediation will be most costly when the macro-prudential intervention is designed to rein in excessive credit or house price growth, as the shift of activity to non-regulated actors will impede the dampening effect of the restrictions; where the key objective is to build financial system buffers, it will be less costly as the core financial system will still benefit from higher buffers.
85. The risk of disintermediation is likely to be higher where LVR restrictions are in place for extended periods. It also depends on the potential for non-regulated entities to take on the restricted lending. The recent turmoil in the NBDT sector means they are unlikely to be significant players in the near future; possible agents would include foreign bank branches or direct activity in the market by foreign parents. However, the current industry structure and breadth of regional networks would mitigate against unregulated players being able to enter this space. Those foreign bank branches that are targeted to business rather than retail lending are arguably unlikely to be interested.
86. Imposition of restrictions beyond the regulated banking sector could be done conventionally by extending the regulatory net to capture the target entities although this would be no small undertaking. Where the risk of disintermediation is judged to be high, other possibilities (and untested to our knowledge) would be applying LVR limits at the contractual level, or making the portion of loans above a regulatory limit non-enforceable in the case of default.<sup>21</sup>
87. Imposition of LVR limits at the contractual level could be achieved by requiring that anyone registering a mortgage in NZ must be registered in NZ for tax purposes, and that mortgages cannot be registered which exceed the 'in-force' LVR limit.<sup>22</sup> This would require legislative change, as well as significant changes to the mortgage registration process so that information on mortgage debt and property value could be associated with the loan at time of signing. It could also require LINZ to monitor and enforce compliance, so would require a cross-agency approach to LVR restrictions.
88. Making 'above the limit' loans unenforceable would provide a strong incentive to lenders to respect the LVR limit (Weale, 2009).<sup>23</sup> An option could be to prohibit certain LVRs under the Credit Contracts and Consumer Finance Act 2003 (CCCFA), although this would not be particularly straightforward given the CCCFA is a consumer protection

<sup>21</sup> While disintermediation risk is frequently mentioned in the literature, we have been unable to find evidence of countries choosing to address this by imposing LVR restrictions via non-prudential avenues.

<sup>22</sup> Something similar to this was mooted in the SSI Report (RBNZ, 2006).

<sup>23</sup> This follows a similar principle to recent changes to Australian consumer credit regulation, which place an onus on lenders to check that borrowers have the capacity to repay, and could see loans set aside that do not meet these provisions (Ellis, 2012).

statute and the purposes here relate to financial stability.<sup>24</sup> A remedy could be that any “prohibited” loans (on the basis of the LVR) are unenforceable; other remedies are fines etc, or the lender could lose a portion of its interest.

89. Neither of these ‘unconventional’ options is straightforward, and both would likely be time-consuming and complex to develop and implement. Further investigation – potentially cross-agency – would be required to develop these as real policy options.

*Interactions with other policy tools*

90. As noted earlier, LVR restrictions are only one tool in the policy toolkit. In the case of a housing credit boom, a number of different instruments could form the policy response, including, *inter alia*, interest rate tightening, countercyclical capital requirements, sectoral risk weights.

91. Policy instruments might be deployed singly, as part of a suite of measures, or sequentially as part of an intensifying response, depending on the specific and unfolding circumstances.

92. While macro-prudential instruments are not designed to play an active role in monetary policy objectives, there is the hope that they might help reinforce the stance of monetary policy. The evidence suggests that LVR limits might be useful from this perspective, but that capital-based LVR measures are unlikely to be effective in reining in house price appreciation or credit growth.

*Cross-border considerations*

[REDACTED]

9(2)(g)(i); 9(2)(d).

94. [REDACTED]

<sup>24</sup> Consumer credit lending is governed by the Credit Contracts and Consumer Finance Act 2003 (CCCFA), which covers all lending for personal, domestic or household purpose entered into in NZ.

[REDACTED]

9(2)(g)(i); 9(2)(d).

## References

Bank of International Settlements (2008) "The Housing Meltdown: Why did it happen in the United States?", *BIS Working Papers WP/259*, L. Ellis.

Central Bank of Ireland (2010), The Irish Banking Crisis: Regulatory and Financial Stability Policy 2003 - 2008, a report to the Minister of Finance by the Governor of the Central Bank, refer Chapter 7.

Ellis, Luci (2012), "Macroprudential Policy: A Suite of Tools or a State of Mind?" speech by Luci Ellis, Head of Financial Stability Department, RBA, 11 October 2012.

Financial Stability Board (2012) "FSB Principles for Sound Residential Mortgage Underwriting Practices", April.

Ha, Y and B Hodgetts (2011), 'Macro-prudential instruments for New Zealand: A preliminary assessment', paper prepared for Reserve Bank workshop on macro-prudential policy, RBNZ, 21 March 2011.

Harrison I and C Matthew (2008), "Project Tui: A structural approach to the understanding and measurement of residential mortgage lending risk", mimeo, Reserve Bank of New Zealand.

IMF (2011a) "Macroprudential policy: what instruments and how to use them? Lessons from country experience", *IMF Working Paper 11/238*, Lim, C, F. Columba, A. Costa, P. Kongsamut, A. Otani, M. Saiyid, T. Wezel, and X. Wu.

IMF (2011b) "How to deal with real estate booms: lessons from country experiences", *IMF Working Paper WP/11/91*, April. Crowe, C, *et al*

RBNZ (2006), *Supplementary Stabilisation Instruments*, Joint Report of the Reserve Bank of New Zealand and the Treasury, February, available at [www.rbnz.govt.nz](http://www.rbnz.govt.nz)

Soultanaeva, A and A Nordberg (2010), The impact of a maximum loan-to-value ratio on the borrowers' expenditure, Sveriges Riksbank Economic Commentaries No.5.

Weale, Martin (2008) *National Institute of Economic Social Research Commentary: The Banking Crisis and the Economy*, available at <http://www.niesr.ac.uk/pubs/searchdetail.php?PublicationID=1834>

Wong E., T. Fong, K. Li and H. Choi (2011) "Loan-to-Value Ratio as a Macro-Prudential Tool – Hong Kong's Experience and Cross-Country Evidence", *Hong Kong Monetary Authority Working Paper 01/2011*.

## Appendix 1: Prudential requirements for high-LVR residential lending

The introduction of Basel II saw a heightened focus on aligning capital requirements with the risk profile of banks' exposures. In line with this, the regulatory framework in New Zealand was modified to make it more risk-sensitive, with extra capital required on high-LVR lending and less capital on low-LVR lending.

- For standardised banks, higher risk weights are required for uninsured loans with LVRs above 80 per cent, and insured loans with LVRs above 90 per cent (refer Table 4). The appropriate risk weights are then applied to the loan pool for the given LVR bracket to determine risk weighted assets, with capital requirements being determined by multiplying risk-weighted assets by 8 per cent.

**Table 4: 'Standardised approach' banks - risk weights for residential lending**

<i>Loan-to-value ratio</i>	<i>Risk weight (%)</i>	
	<i>Without qualifying lenders' mortgage insurance</i>	<i>With lenders' mortgage insurance</i>
Does not exceed 80%	35	35
Exceeds 80% and less than 90%	50	35
Exceeds 90% and less than 100%	75	50
Exceeds 100%	100	100
<i>Estimated capital requirement on a \$100 mortgage</i>		
75%	\$2.80	\$2.80
85%	\$4.00	\$2.80
95%	\$6.00	\$4.00

- For 'internal model' banks (currently only the large Australian banks), higher minimum loss given default (LGD) requirements apply for residential lending with an LVR of 60 per cent or higher (refer

- Table 5). Downturn LGD is a key input to the Basel II capital equation, with higher LGD numbers resulting in higher capital requirements.<sup>26</sup>

---

<sup>26</sup> For a more detailed explanation of the calculation of capital requirements, refer Box 2 - "Quality of bank capital in New Zealand", Hoskin, K. and S. Irvine, RBNZ Bulletin Article, September 2009.

**Table 5: "Internal model" banks - minimum LGD for residential lending**

<i>Loan-to-value ratio</i>	<i>Loss Given Default (%)</i>	
Less than 60%	10	
60% – 69%	20	
70% -79%	30	
80% -89%	35	
90% -100%	40	
<i>Estimated average capital requirement on a \$100 mortgage</i>		
	<i>PD=1%</i>	<i>PD=2%</i>
75%	\$3.54	\$4.72
85%	\$4.13	\$5.51
95%	\$4.73	\$6.30

As part of their General Disclosure Statements, all locally regulated banks have been required to provide quarterly data on residential lending by LVR bucket since March 2008:

- LVR reporting buckets are the same as the buckets used by internal model banks (

- Table 5).
- The data provide an overview of trends in housing lending by LVR since 2008; however, the limited history makes it difficult to assess whether the share of high-LVR lending is excessive, given that they start in a period of abnormal financial market activity, and do not encompass 2007, a known period of excessive high-LVR lending.

## Appendix 2: Summary of cross-country LVR measures

Country	Intensity*	Type of LTV measure			Objectives													
		Credit-related	Capital related		Risks related to strong credit growth and credit driven asset-price inflation						Risks arising from excessive leverage		Risks related to large and volatile capital flows					
		LTV cap Maximum term	Risk weight	Extra capital	Extra Provision	Build financial system buffers	Improve credit quality	Limit banks' exposure to real estate	Dampen/ support credit growth	Reduce procyclicality	Dampen speculative activity	Curb house price inflation	Housing market stability	Housing affordability	Reduce household indebtedness	Consumer protection	Reduce currency risk	Support monetary policy
<b>Western Hemisphere</b>																		
Canada	5	X											X					
Chile	5	X							X							X		
Colombia	2	X													X			
<b>Asia</b>																		
China	6	X						X	X									
Hong Kong	5	X							X									
India	4	X				X			X									
Korea	6	X							X									
Malaysia	6	X						X	X									
Singapore	6	X						X	X									
Thailand	6	X						X	X								X	
<b>Western Europe</b>																		
Ireland	3					X			X									
Italy	3	X				X			X									
Portugal	3			X		X			X									
Spain	4			X		X			X									
<b>Nordic countries</b>																		
Norway	4	X							X									X
Sweden	2	X							X									
<b>Central and Eastern Europe</b>																		
Bulgaria	4					X			X									
Croatia	3	X					X		X									
Hungary	3	X							X									
Poland	4	X				X			X				X					
Romania	2	X					X		X									
Serbia	4	X					X		X									
Turkey	3	X					X		X									
<b>Middle East</b>																		
Israel	4	X				X			X									X
Lebanon	2	X							X									

\* 0 represents no use of instruments, and 1 denotes the use of a single instrument. For each of the following attributes, i.e., multiple, targeted, time-varying, discretionary and used in coordination with other policies, the value of 1 is added.  
 Source: Macroprudential Policy: What Instruments and How to Use Them? Lessons from Country Experiences (IMF, 2011); national sources