



## **Unpacking the toolkit: the transmission channels of macro-prudential policy in New Zealand**

**Lamorna Rogers**  
**Macro-Financial Stability, Reserve Bank of New Zealand**

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## Introduction

The Global Financial Crisis (GFC) highlighted again the consequences of financial system instability and its potential to cause significant economic damage. This instability may take the form of a boom-bust cycle whereby excessive credit and asset price growth during the upswing is followed by abrupt contractions in lending and falling asset prices in the downswing. These excesses can reflect pro-cyclical lending behaviour, with lenders and borrowers tending to become over-leveraged as asset prices rise (easing collateral constraints), and excessively cautious during the subsequent downturn (Spencer, 2010).

The speculative response to rising asset prices can exacerbate these cyclical extremes, as investor demand helps to drive asset prices up further, creating a self-propelling nexus between asset price growth and credit growth. In turn, boom-bust financial cycles risk setting off a destabilising feedback loop between the real economy and the financial system that can have significant and lasting economic costs. Research shows that banking crises are associated with substantial costs in the form of foregone output, higher unemployment and significant falls in net worth.<sup>1</sup>

The Reserve Bank is currently evaluating the use of macro-prudential policy to reduce risks to the stability of the financial system and the broader economy. This involves the use of various prudential instruments in the face of rapid credit growth, rising leverage or abundant liquidity – factors that were prevalent in the lead up to the GFC. These instruments are intended to help increase the resilience of the financial system and to dampen excessive swings in the financial cycle – as reflected in credit and asset price growth – in order to promote financial system stability. The financial cycle is a necessary phenomenon and macro-prudential intervention would not try to prevent its normal ups and downs; rather, it would be targeted at periods of excessive growth in credit and

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<sup>1</sup> The economic cost of crisis can be permanent or temporary, depending on whether the economy is subsequently able to return to its pre-crisis output path. A review of studies on the costs of banking crises found a median cumulative loss of output of 63 per cent of pre-crisis GDP, with significantly higher losses where the effect was assumed to be permanent (BCBS, 2010).

asset prices, or when international financial market developments are creating serious pressures for the New Zealand financial system.

Macro-prudential regulation is not intended to replace existing (micro)-prudential regulation. In the New Zealand context, micro-prudential regulation aims to promote the stability of the financial system, largely by helping to ensure the prudential soundness of individual financial institutions. However, as the GFC illustrated, existing micro-prudential policy measures can still prove inadequate in circumstances 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. Moreover, existing prudential regulations are limited in their ability to deal with the situation in which an abrupt change of sentiment occurs as the financial cycle turns. This can see lenders and borrowers become overly cautious, choking off the flow of credit to the economy, and exacerbating the economic downturn. Macro-prudential policy offers scope to take actions to help ensure credit remains available to creditworthy borrowers in a downturn.

Macro-prudential policy thus aims to address the limitations of the existing approach. Rather than replacing traditional micro-prudential policy, it adds to and complements it. The macro-prudential authority deploys many of the same prudential instruments, but it explicitly and specifically targets *systemic* risks that *build up over time*.

The four macro-prudential instruments under consideration are:

- adjustments to the minimum core funding ratio (CFR)
- the counter-cyclical capital buffer (CCB)
- sectoral capital requirements
- restrictions on high loan-to-value ratio (LVR) residential mortgage lending.

A key consideration in evaluating the proposed instruments is their likely effectiveness in meeting the Reserve Bank's statutory objectives for prudential policy, and any potential costs associated with their implementation. To assist in this evaluation, we have prepared a series of transmission maps that provide stylised representations of how changes in individual instruments, as part of a time-varying macro-prudential approach, are expected to contribute to the Reserve Bank's prudential policy objectives.<sup>2</sup>

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<sup>2</sup> This analysis builds on recent work by the Committee on the Global Financial System (CGFS, 2012).

The time-varying aspect of macro-prudential policy distinguishes it from micro-prudential policy. It is important that any intervention be sufficiently early to build buffers and gain traction in leaning against the credit cycle; too late an intervention could even risk precipitating a disorderly unwinding of imbalances. Research also suggests that the costs of delayed action (financial crises) are typically higher than a premature intervention (CGFS, 2012).

This paper does not explore the potential for macro-prudential instruments to assist in meeting the Reserve Bank's other statutory objective, price stability. However, it is expected that, in most circumstances, measures undertaken to meet macro-prudential objectives will provide support for monetary policy. For example, a macro-prudential tightening that results in slower credit and asset price growth would also allow a lower Official Cash Rate setting, given the inflation target. For the purposes of this paper, however, monetary policy settings are assumed as given, as are micro-prudential settings.

It should be noted that the design and implementation of macro-prudential instruments and frameworks is a work in progress in most countries, and experience with many of the instruments is limited. Questions remain to be answered concerning the appropriate timing and calibration of the instruments, and the extent to which behavioural responses will differ in the face of a macro-prudential (temporary) intervention compared to a permanent change in micro-prudential settings. All of these create uncertainty around the likely impact of macro-prudential policy measures and the strength of the various transmission channels, which needs to be borne in mind when reading the transmission maps. The Reserve Bank expects to learn more about the instruments over time, both from our own experiences and from other jurisdictions.

## **Understanding the transmission mechanisms of the macro-prudential instrument set**

The following maps describe the major transmission channels through which tightening or easing of a macro-prudential instrument (MPI) can *build the resilience of the financial system* or *reduce extremes in the financial cycle*. For most instruments, the impact will be directly reflected in financial system resilience (due to higher funding or capital buffers), with the credit/asset price cycle indirectly affected via banks' subsequent decisions regarding the price and quantity of credit. Restrictions on high-LVR lending work differently, as they directly affect the flow of credit, but may indirectly result in greater resilience of the financial system due to stronger household balance sheets and tighter risk management.

The maps also incorporate the effect of reduced extremes in the financial cycle on financial system resilience. Slower credit and asset price growth makes borrowers as a group more resilient as they are less likely to be over-leveraged and more able to withstand income or asset price shocks. In turn, this has a positive effect on financial system resilience, as more resilient borrowers are less likely to default, and reduced risk of falling asset prices helps protect the value of banks' collateral.

*Expectations*-based implications for bank and market participant behaviour are also shown. The focus on expectations reflects the key role that these play in banks' capital and liquidity planning, risk management and lending decisions as well as to those of other market participants. As in the case of the monetary policy transmission mechanism, expectations are therefore likely to be a key part of the transmission mechanism for MPIs.

One factor that is likely to influence expectations is the strength of the policy signal. As part of its normal communication process, the Reserve Bank already provides assessment of emerging systemic risk, and where appropriate, may publicly call for changes in lender behaviour (often known as 'moral suasion'). This moral suasion effect may be enhanced by the presence of credible macro-prudential tools that could be employed if banks are judged not to be responding in a timely or sufficient manner. In turn, deploying a macro-prudential tool is likely to send a much stronger policy signal than public statements by the central bank that are not accompanied by policy

measures. Macro-prudential intervention is therefore likely to have a stronger impact on lending standards and risk management (although how strong that impact proves to be is something that only experience with the instruments will demonstrate).

The transmission maps also consider potential *policy leakages and unintended consequences*. For example, where banks are already carrying voluntary buffers, in the form of capital or core funding that materially exceeds regulatory requirements, imposition of an additional macro-prudential overlay may not be binding. Instead, its impact will depend on whether banks and markets view the macro-prudential requirement as something to be met over and above existing buffers.

Macro-prudential regulation covers much but not all of the financial system. Capital-based instruments and adjustments to the minimum CFR would directly apply to locally incorporated banks (around 90 percent of the total assets of the New Zealand banking system), while loan-to-value restrictions would apply to all registered banks.<sup>3</sup> As such, it is possible that financial disintermediation could have the effect of displacing credit growth to foreign bank branches or the non-bank lending sector (including possibly to lenders based offshore). Should there be a substantial risk of financial sector disintermediation, the Bank would investigate the possibility of extending the perimeter of macro-prudential regulation. Macro-prudential regulations could potentially be extended to the non-bank deposit taking sector given the Reserve Bank's role as regulator of the sector. It should be noted, however, that the bank has no regulatory authority for non-deposit-taking lenders.

A necessary by-product of effective macro-prudential intervention is that it will constrain financial sector intermediation activity, potentially resulting in short-term output losses and some credit-worthy borrowers not being able to access finance. The more far-reaching the tool and the tighter the setting, the greater these efficiency costs will be. However, the Basel Committee on Banking Supervision (BCBS) note that the costs of some system-wide tools such as capital requirements may not be substantial when compared with their likely benefits (BCBS, 2010). An important part of the policy making process will be an assessment of the likely costs as well as benefits (and leakages)

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<sup>3</sup> When the CCB is imposed, Basel III reciprocity arrangements would also see foreign bank branches required to hold extra capital against their New Zealand exposures.

associated with using any of the instruments. As with any macroeconomic policies, judgement will be key. To the extent that the Reserve Bank will be making judgements about the current and future state of the financial cycle when using instruments, there will always be some risk of misreading conditions.

Where available, the transmission maps are complemented by some evidence on the *effectiveness* of the instruments in achieving the macro-prudential policy objectives. Empirical evidence on the channels will remain limited until countries gain greater experience in using the instruments. In the meantime, international evidence on some instruments can help to shed light on effectiveness but it should be remembered that it may not always transfer to our own circumstances.

The macro-prudential instruments being considered by the Bank can be classified into three groups: liquidity-based instruments, capital-based instruments and asset-side instruments. The presentation of the transmission maps is grouped along these lines.

## **Understanding the transmission mechanisms of a Macro-prudential tightening**

### **Liquidity-based macro-prudential instruments (CFR)**

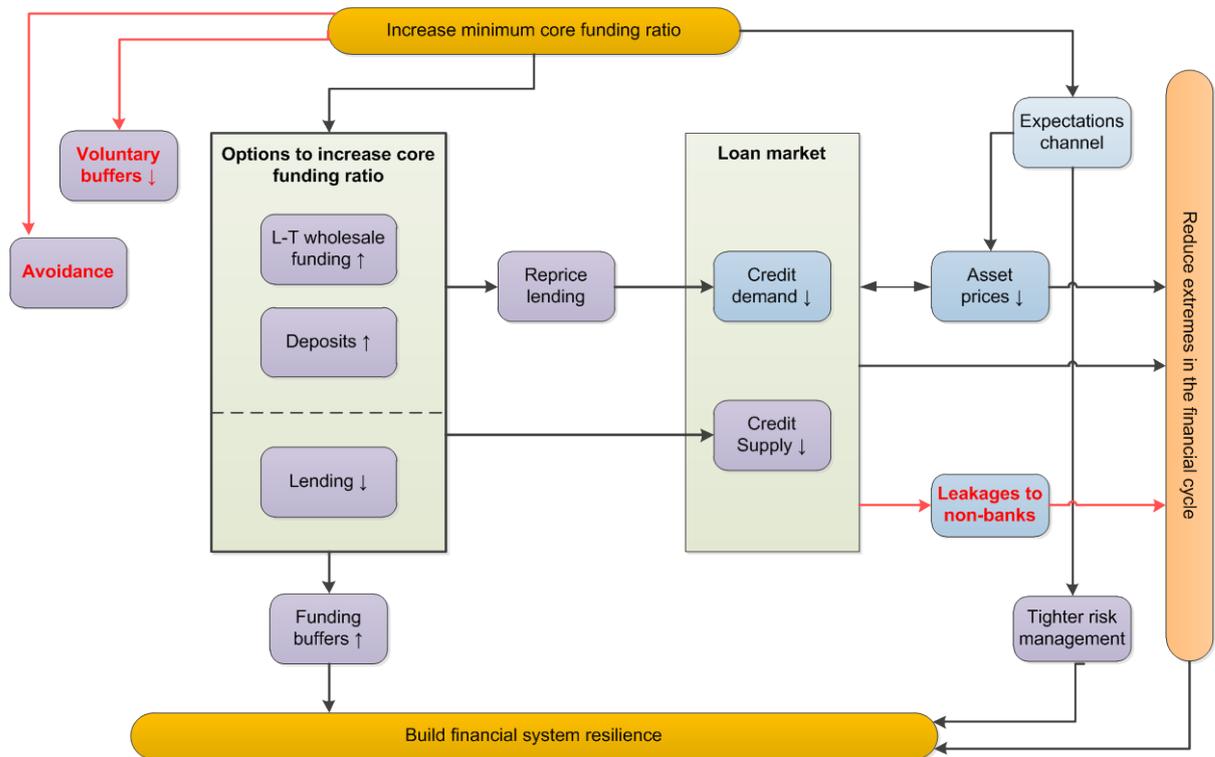
The prudential policy of the Reserve Bank was substantially altered in 2010, in order to reduce the vulnerability of the New Zealand banking system to the types of funding and liquidity shocks that were seen during the GFC. The introduction of the mismatch ratio and the minimum core funding ratio tightened the regulation around banks' liquidity and funding. These underlying 'micro-prudential' regulatory settings are designed to ensure that banks, in their normal day-to-day operations, take out appropriate self-insurance against shocks to liquidity or funding markets. However, these settings might not always be appropriate to contain risks to the financial system during periods of excessive optimism in financial markets or in the face of material changes to the price and availability of funding. They address normal 'through-the-cycle' risk but do not cater for systemic risk that may accumulate during periods of over-exuberance in financial markets and result in under-insurance against systemic shocks.

The minimum CFR requirement currently requires banks to fund at least 75 percent of their lending from 'core' sources, broadly defined as retail deposits, wholesale funding with a maturity of 1 year or more, and capital. The CFR requirement was phased in progressively, starting at 65 percent in April 2010 and ending at 75 percent in January 2013. Given the newness of this tool and the large shifts in funding markets in recent years, it is expected that the appropriate permanent (micro-prudential) level of calibration will be reviewed as experience is gained.

A macro-prudential adjustment to the CFR can be thought of as an overlay, to be applied in times of excessive liquidity and credit growth, and removed during times of sustained market pressure. Figure 1 maps the impact of an increase in the CFR.

Figure 1

Transmission map of raising minimum CFR



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

- **Impact on resilience.**

- Funding buffers will be directly affected if banks choose to increase their core funding ratio, either by using a greater share of stable funding or by reducing lending. Reduced reliance on short-term funding increases the 'stickiness' of funding and extends rollover periods, making banks better able to withstand periods of funding market stress. This will limit contagion effects across the banks, and negative feedback to the real economy.
- Resilience could also be increased indirectly. Should the higher CFR result in a slowdown in credit growth, this will reduce the risk of households and businesses becoming over-leveraged and asset prices becoming excessively inflated. This will make borrowers more resilient to stress, and thus less likely to default, and will reduce the impact of any falls in asset prices on bank collateral. Resilience could also be enhanced by the effect on expectations, which may lead to tighter risk management standards (see below).

- **Impact on financial cycle.**
  - A reduction in lending will help mitigate extremes in the financial cycle.
  - Alternatively, banks may increase their CFR by using a greater volume of stable funding. This would likely be achieved either by increasing long-term wholesale funding or by increasing deposit funding (which would depend, *inter alia*, on deposit supply constraints and the elasticity of deposits to interest rates).
  - It is possible that the higher cost of stable funding would be passed through to borrowers in the form of increased lending costs, dampening credit demand. However, in a credit boom, credit spreads on long-term funding relative to short-term funding typically become compressed, and the marginal increase in the cost of funding may be small, reducing this effect.
  
- **Expectations-based effects.** Announcement of an increase in the CFR may help to condition the behaviour of both banks and market participants, with the potential to bring forward increases in funding buffers ahead of regulatory deadlines. Expectations of higher funding costs and consequently slower credit growth could also weigh on expectations of asset price growth, helping to contain the credit boom. The impact on expectations of banks and market participants could see banks tighten funding policies.
  
- **Leakages and potential unintended consequences.** A CFR increase may not be effective if it is absorbed by a reduction of pre-existing voluntary buffers or circumvented.
  - New Zealand banks typically have large voluntary funding buffers, with the system CFR sitting at 85 percent as at December 2012 compared to a regulatory requirement of 75 percent. Banks could choose to reduce internal buffers relative to the regulatory requirement, attenuating the impact of the CFR increase.
  - It is also possible that lenders that are not subject to the CFR requirement might opportunistically expand their lending share. Should dis-intermediation become an issue, the Bank could consider expanding the regulatory perimeter for those institutions over which has jurisdiction.
  - Careful monitoring of the banks' CFR positions will be necessary to ensure full compliance with any changes in the minimum CFR.

- **Effectiveness.** The introduction of the minimum CFR requirement in New Zealand saw the system-wide CFR rise from a little under 70 percent in October 2008, when the Bank first consulted on the CFR policy, to 85 percent at end 2012. This reflected both an increased volume of stable funding and relatively low rates of lending growth over the period. While the introduction of the CFR is likely to have underpinned increased use of stable funding (against a backdrop of market pressure for greater stable funding generally), the slowdown in lending was attributable to broader economic and financial conditions, including weak growth and deleveraging on the part of borrowers and tighter credit supply conditions.

A macro-prudential increase in the CFR might play out a little differently, given the temporary nature of the increase. As part of the international Basel III regulatory reforms, a Net Stable Funding Ratio (NSFR) is being introduced in many countries, which is broadly akin to the CFR, in that it seeks to increase the use of stable funding sources. With regards to *resilience*, a study of the long-term economic impact of stronger capital and liquidity requirements estimates that the introduction of the NSFR decreases the likelihood of systemic crises by 10–20 percent (BCBS, 2010). Simulation-based studies also show that cyclical adjustment of liquidity requirements can mitigate negative feedback spirals. The evidence further suggests that liquidity-based MPIs could be effective in curbing the *credit cycle*, although the uncertainty is large given the scarcity of information. For example, studies assessing the impact of Basel III suggest that the introduction of the NSFR could trigger a 14–25 basis point increase in lending spreads (CGFS, 2012). These studies largely relate to adjustment of micro-prudential settings so the effect of a (temporary) macro-prudential tightening might be smaller. Notwithstanding, had a CFR in place and/or tightened prior to the GFC, it may have helped stem the rise in lending fuelled by cheap offshore funding.

**Capital-based macro-prudential instruments (CCB, sectoral capital requirements including increased capital requirements on high-LVR housing lending)**

A countercyclical capital buffer framework will be implemented on 1 January 2014 alongside other aspects of the Basel III regime in New Zealand. The CCB framework aims, during the credit cycle upswing, to provide the banking system with an additional cushion against subsequent losses or sharp increases in risk-weighted assets that may be associated with periods of credit downturn.

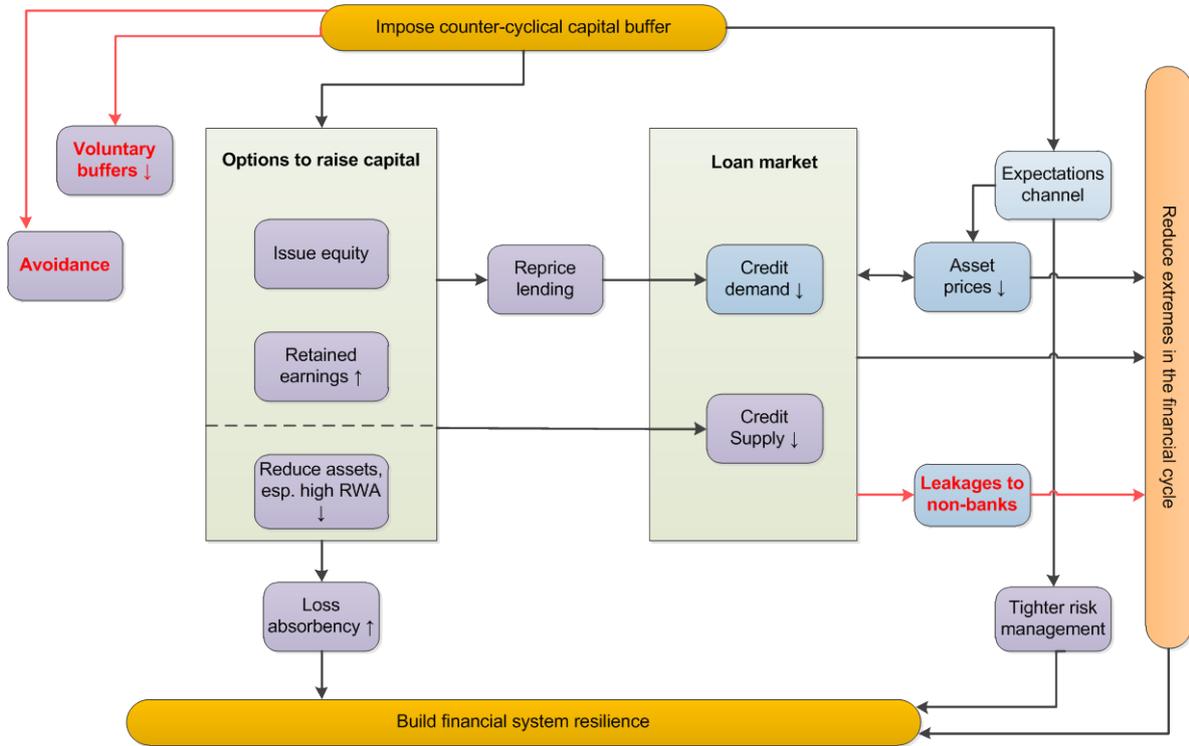
When risks to the New Zealand financial system are judged to be low, the CCB will be set to zero. However, where private sector credit growth is judged to be becoming excessive, banks may be required to hold a CCB, which will provide the banking system with an extra layer of high quality capital (common equity). The CCB rate is typically expected to range up to the equivalent of 2.5 percent of risk-weighted assets; however, there is always the possibility that it may need to be higher.

The Reserve Bank is also considering use of macro-prudential sectoral capital requirements, which would single out specific sectors where excessive risk was being taken on, such as households, commercial property or the farm sector. Sectoral capital requirements (SCR) could also be more narrowly imposed at the subsector level, on high-LVR residential mortgage lending for example. The requirements would typically be applied through overlays to sectoral risk weights, say for housing lending or agricultural lending, but could also be applied through a capital add-on that is calibrated as a proportion of banks' risk-weighted exposures to the sector. When sectoral risks are judged to be low, there will be no macro-prudential SCR in effect. Sectoral capital requirements applied via risk-weights would be part of the minimum regulatory capital requirement, whereas a capital add-on would be treated in the same way as the CCB.

Figure 2 maps the impact of imposing a CCB so as to ensure the banking system as a whole is appropriately capitalised from a macro-prudential perspective; Figure 3 maps the effect of sectoral capital requirements, which target the relative price – and risks arising from – lending to a particular sector (or subsector) of the economy.

**Figure 2**

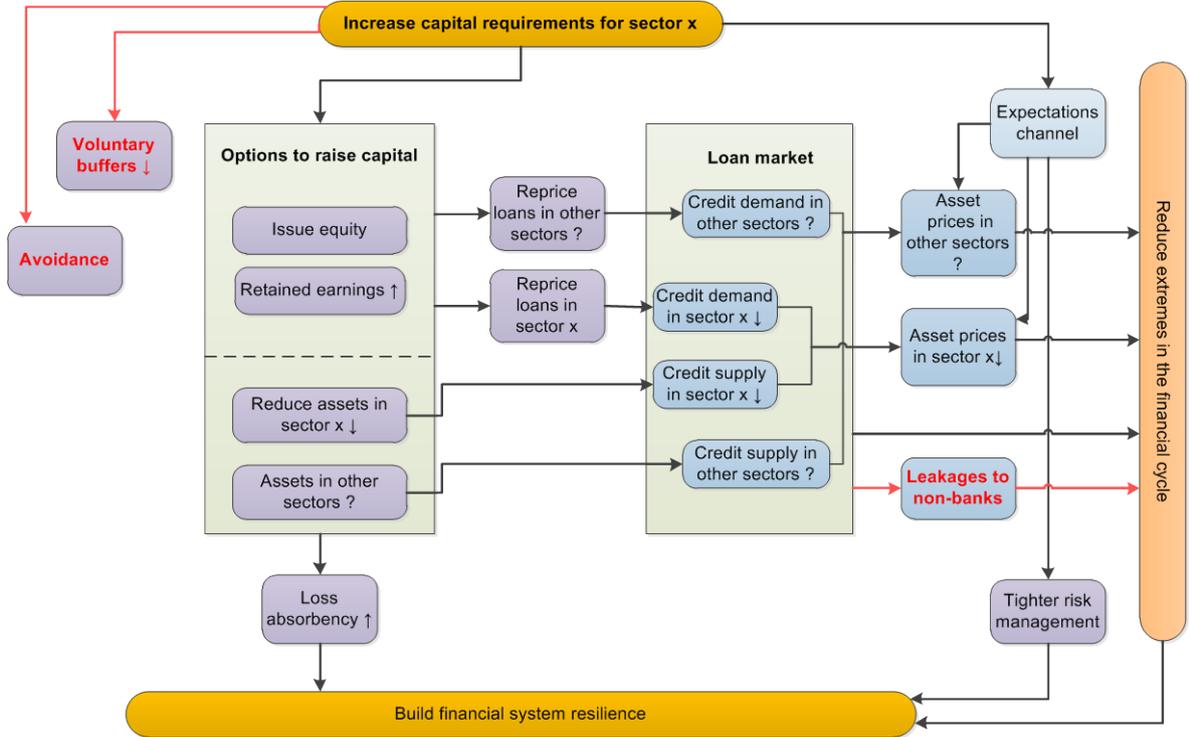
**Transmission map of raising capital requirements**



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

**Figure 3**

**Transmission map of sectoral capital requirements**



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

- **Impact on resilience.**

- Resilience will be directly affected if banks choose to increase their loss absorbency capacity, either by increasing capital or by reducing lending. Higher capital ratios provide the banking system with an extra cushion to absorb losses or sharp increases in risk-weighted assets that are associated with periods of financial distress. This means that banks are able to weather losses of a greater magnitude before their solvency is called into question, or they face having to raise additional capital in a period of stress, thus reducing the likelihood of a costly disruption to the supply of credit and other financial intermediation services.
- As with the CFR, a slowdown in credit growth could indirectly enhance resilience, via the impact on the credit cycle and/or expectations.

- **Impact on financial cycle.**

- Banks could meet the increased capital requirement by raising capital, either through issuing equity or increasing retained earnings, with capital typically easier to raise during a credit boom. An increase in retained earnings could be achieved either by reducing the share of distributions or increasing profits. However, in a competitive environment (as is typical during a credit boom), banks may be constrained in their ability to increase profits through higher lending charges.
- Banks could also meet the capital requirement by reducing asset holdings, particularly for asset classes with higher risk weightings. The reduction could either be across the board or targeted to higher risk weighted asset classes.
- Where banks raise more capital, this could increase their cost of funding, at least in the short term. Over the longer haul, however, a higher level of capitalisation would be expected to lower the risks of bank default potentially reducing the cost of debt (GCFS, 2012). Consequently, it remains unclear how capital requirements introduced for macro-prudential purposes will affect the market pricing of debt.
- Should funding costs increase and banks re-price lending to reflect this, the higher price of lending will weigh on credit demand. The strength of the effect on the price of lending will depend on banks' internal pricing models, which take into account a number of factors, including the cost of funds, assessment of the riskiness of the loan, and competitive positioning. As well, where banks

utilise their own internal models of economic risk rather than regulatory models of risk, a change in the regulatory risk requirements will not necessarily flow through to the pricing model.

- The impact on credit conditions of a sectoral capital requirement (or subsectoral) is broadly similar to the CCB. However, the potential responses are more complex, reflecting the wedge in incentives between the targeted sector (where the cost of lending becomes relatively more expensive) and other sectors. Compared to the CCB, banks may be less able to raise external equity, given that it would be funding lending to a sector that has been singled out as risky by the regulator.
- **Expectations-based effects.** Given that the macro-prudential capital requirement would not take effect until the end of the notice period, the first impact could be realised through the effect on expectations.
  - Where the macro-prudential intervention has a strong effect on expectations of banks and markets participants, banks might tighten lending standards (unwinding some of the customary easing seen in a credit boom), and market pressure could see banks meeting the new capital requirements sooner rather than later.
  - Expectations of slower credit growth could see asset price expectations revised, helping to contain the credit boom.
  - Capital requirements that single out particularly sectors or subsectors as risky could have a stronger signalling impact than broader measures such as the CCB.
- **Leakages and potential unintended consequences.** Additional capital requirements may not be effective if they are absorbed by a reduction of voluntary buffers or circumvented:
  - New Zealand banks typically have large voluntary capital buffers, with the system-wide Tier 1 capital ratio sitting at around 11 percent of risk-weighted assets at December 2012, as against a Basel III regulatory requirement of 8.5 percent (including the conservation buffer).
  - The effectiveness of additional capital requirements will depend on the calibration of the underlying micro-prudential risk weights – if these were too loose, then a very large increase in the capital requirement would be needed to bring capital into line with actual risk.

- The more effective the capital requirement in altering bank behaviour, the greater the potential efficiency costs, in terms of banks holding more capital than they would judge commercially necessary, and some borrowers not being able to access/afford credit. However, compared to blunter instruments such as LVR restrictions, credit rationing as a result of additional capital requirements is likely to occur predominantly through pricing effects rather than quantitative restrictions.
- Financial disintermediation is a risk, as the Reserve Bank's powers with regard to capital management only apply to locally incorporated banks. Once Basel III is in force, reciprocity arrangements mean that a locally applied CCB would also be applicable to foreign bank branches' operations in New Zealand, but Basel III reciprocity does not cover sectoral capital requirements.<sup>4</sup> Should lenders that are not subject to the macro-prudential capital requirement expand lending to fill any gaps left by domestic lenders, this would reduce the impact on the financial cycle, but might have less effect on financial system resilience, given that these lenders fall outside the core banking system. Again, the Reserve Bank could investigate expanding the regulatory net should this be deemed necessary.
- **Effectiveness.** International studies find that higher levels of capital increase the *resilience* of the financial system. For example, based on a range of models, the BCBS Long-term Economic Impact Assessment estimates that a 1 percentage point rise in capital requirements leads to a 20–50 per cent reduction in the likelihood of systemic crises. In absolute terms, however, marginal benefits of higher capital ratios decrease with higher initial capital levels (BCBS, 2010).

Evidence on the impact of capital-based MPIs on the *credit cycle* is mixed. The CGFS (2012) finds that capital-based MPIs are effective in affecting (i) the price and (ii) the

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<sup>4</sup> The Basel III global standard envisages reciprocity arrangements to help maintain a level playing field between banks that are regulated locally (including the subsidiaries of the Australian parent banks) and foreign banks that are not regulated by the local supervisor (such as the branches of foreign banks operating in New Zealand). Under reciprocity, the CCB that would apply to each bank at a consolidated level would reflect the geographic composition of its portfolio, i.e. a weighted average of buffers across the group's regional operations.

quantity of credit, even though the uncertainty about precise magnitudes is relatively large:

- First, several studies suggest that lending spreads could increase between 2 and 20 basis points in response to a 1 percentage point increase in capital ratios, depending on whether funding costs change in response to greater equity cushions due to their effect on the likelihood of failure.
- Second, tightening capital-based MPAs seems to decrease the volume of credit in the economy. There is evidence that, in the short run, banks seem to respond to an increase in target capital ratios by making about a half to three quarters of the required change through an increase in capital and the remainder through a reduction of risk-weighted assets, of which in turn only half is in the form of reduced lending.

However, IMF cross-country studies are less positive, finding little relationship between capital-based measures and slower credit growth or house price appreciation (IMF, 2011a; IMF 2011b).

Again, the studies often cover quite different institutional contexts to New Zealand, and are based on changes to underlying prudential settings rather than macro-prudential interventions, all of which may limit their relevance to New Zealand.

**Asset-side macro-prudential instruments (quantitative restrictions on high-LVR residential mortgage lending, including outright LVR limits)**

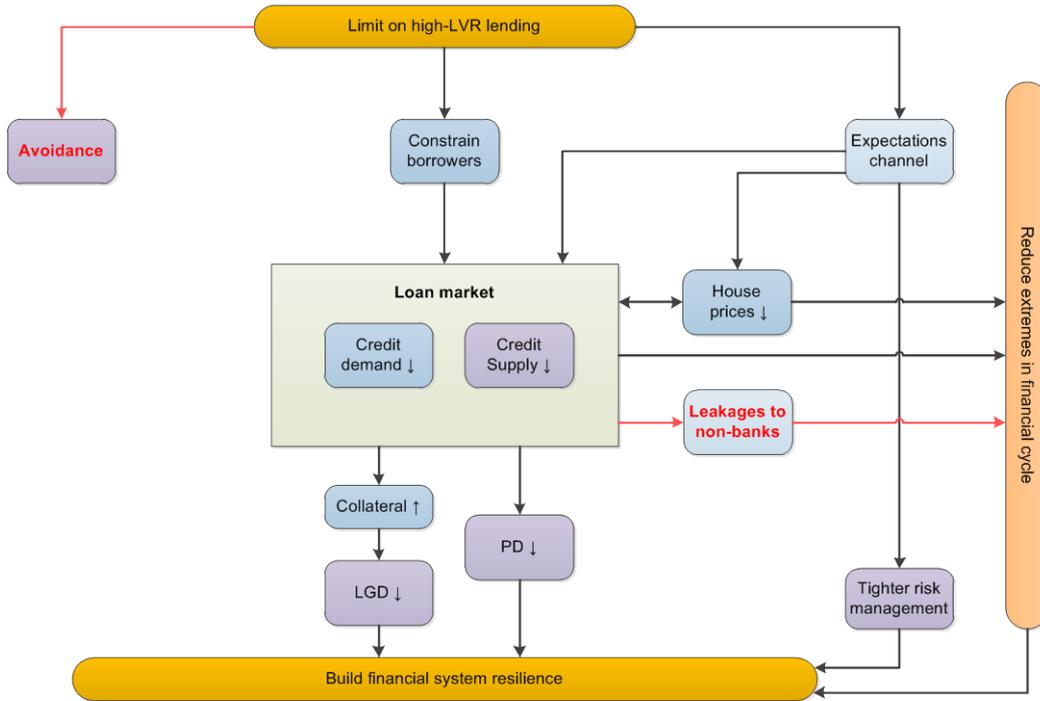
Restrictions on high-LVR housing lending provide a supplementary tool for addressing the financial stability risks that could emerge from imbalances in the housing sector. They would typically be applied when growth in high-LVR housing lending and house prices is judged to be excessive, with the objective of dampening the housing cycle and strengthening the resilience of banks and households.

The micro-prudential framework already requires banks to hold more capital against high-LVR lending, reflecting the higher risk of this lending. LVR restrictions go beyond this by placing restrictions on the quantity of high-LVR lending. Restrictions could take the form of an outright prohibition on mortgages that exceed a specified proportion of the property value (the loan-to-value ratio), or quantitative restrictions on the share of high-LVR lending, either as a proportion of the lender's housing loan book or of new housing lending. For example, when writing new loans, banks might be restricted to writing no more than 10 percent of residential mortgages with a LVR above 90 percent.

Figure 4 maps the impact of outright LVR limits, which directly constrain borrowers' lending capacity as they block all access to high-LVR lending. Figure 5 maps the effect of quantitative restrictions; the impact will vary by bank, according to whether the restriction proves binding given their existing share/flow of high-LVR lending.

**Figure 4**

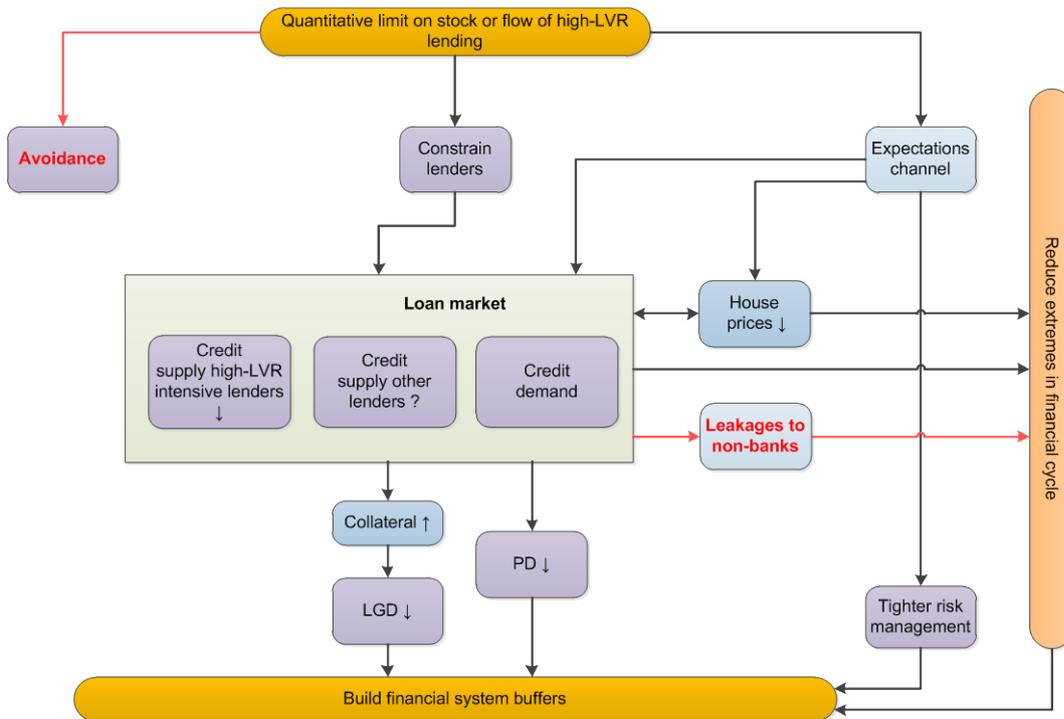
**Transmission map of housing LVR limits**



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

**Figure 5**

**Transmission map of quantitative restrictions on high-LVR lending**



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

- **Impact on resilience.**

- LVR limits can increase the resilience of the banking system directly through decreasing both the probability of default (PD) and loss-given-default (LGD) of loans. First, LVR limits reduce PDs, as borrowers have higher buffers to withstand negative shocks. Second, by restricting the amount that can be borrowed against the given value of a property, limits on LVR ratios restrict leverage and, in doing so, decrease LGD. These effects will need to be balanced against the fact that the banking system will be holding less capital, as there will be less high-LVR lending. Where micro-prudential capital requirements are appropriately calibrated for the extra risk in the high-LVR lending book, the increase in resilience due to LVR restrictions would be cancelled out by the decrease in capital. However, it should be emphasised that LVR restrictions are likely to be imposed at times when risks associated with such lending appear excessive (and hence potentially not adequately reflected in micro-prudential settings).
- Resilience is also increased indirectly via the impact on the credit cycle or expectations, which in turn, may lead to a tightening of banks' risk management standards.
- Where quantitative limits are applied, the impact on individual banks' resilience will depend on whether the limit is binding. If the overall share of high-LVR lending falls, this will increase the resilience at a system level also. A system-wide fall in the share of high-LVR lending will depend on whether other banks step in to take up the high-LVR lending vacated by the former group

- **Impact on the credit cycle.** Tighter LVR caps restrict the quantity of credit by limiting the funding available for marginal borrowers, reducing effective housing demand and increasing savings. In principle, house prices will tend to ease, reducing households' ability to obtain credit and withdraw equity more generally. The effective demand for credit is therefore likely to fall more broadly.

The strength of these transmission channels may be moderated by the fact that LVR limits do not directly affect the cost of borrowing – they simply restrict the ability of a specific group to borrow. While this may constrain some households, it is also possible that the demand from others with sufficient wealth might continue to drive house price growth.

The ultimate impact (including second-round effects) of any change in LVR caps may be quite sensitive to its initial impact on house prices, in particular when house price growth is disconnected from fundamentals. If LVR tightening is followed by an initial house price decline, LVRs of existing borrowers will increase, reducing the scope for equity withdrawals and GDP growth, which may trigger further declines in house prices. If, by contrast, house prices continue to rise after the LVR cap is tightened, aggregate demand may continue to be supported by equity withdrawals as LVR ratios fall. Both amplification channels might be stronger when house price changes are due to speculative demand.

The effect of imposing a quantitative restriction rather than outright limit will depend on whether banks that are not bound by the restriction increase their share of high-LVR lending. If these lenders soak up the marginal borrowers, the restrictions may be less effective in containing aggregate housing lending.

- **Expectations-based effects.** LVR limits provide a highly visible signal of the central bank's discomfort with developments in the housing market, which is likely to increase its impact on expectations. However, there is a risk of expectations playing a destabilising role under some circumstances. If caps are expected to be tightened, households might respond by bringing forward borrowing. House price growth might then accelerate, at least temporarily. These effects may be avoided by implementing limits over relatively short periods of time. Accordingly, the notice period could be as short as two weeks for LVR restrictions.

Quantitative restrictions are likely to provide a weaker signal than outright LVR limits, but could still help alter market expectations and risk management practices, thereby increasing resilience. The risk of households bringing forward borrowing is still present, but likely to be less than in the case of outright limits given the likely lower profile of this measure.

- **Leakages and potential unintended consequences.** There are likely to be three distinct channels for leakages to occur:
  - First, there may be leakages to the unregulated sector and foreign banks. Note that in the case of quantitative restrictions, the incentives for third parties

to enter the market will be lower, given that there will still be some high-LVR lending happening in the core banking system.

- Second, arbitrage through non-mortgage (unsecured) top-up loans is a possibility.
- Third, if households are constrained by LVR limits over an extended period, the structure of the housing market could evolve in ways countering the intended effect (e.g. via the emergence of part-purchase, part-rent models of home ownership). In such a scenario, underlying demand for housing would remain unaffected and, hence, house prices would be unlikely to react to changes in LVR limits. This suggests that the use of LVR limits would have to be accompanied by tight market surveillance; these risks are expected to be mitigated by the temporary nature of such restrictions which are not intended to be in place for protracted periods.

An unintended consequence of LVR limits is that they will tend to directly impede some viable borrowers' access to home ownership, or to use their equity for other purposes. The concentration of high-LVR lending amongst groups such as first-home buyers may also have broader distributional effects, which might have to be managed via mitigating policy measures. In addition, changing LVR limits may affect the number of housing transactions. While this may be helpful when turnover is high and the market shows signs of overheating, the decline in the number of transactions may have unintended effects in the form of increased price volatility.

It is also acknowledged that loan-to-value ratios do not capture all forms of risk affecting housing loans. In particular, debt-servicing ability also has an important bearing on the default risk of mortgage lending and some countries have applied restrictions on debt servicing ratios as part of their macro-prudential frameworks. While the Reserve Bank is not contemplating such measures at this time, our regular assessments of financial conditions take into account trends in the household sector's debt servicing burden as well as bank standards applying in this area

**Effectiveness.** There is evidence that asset-side MPIs increase the resilience of banks by increasing the *resilience* of borrowers. Specifically, several studies find that tighter LVR caps 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).

The impact on the *credit cycle* is less well documented, as relatively few countries have instituted LVR caps in a macro-prudential fashion. The available evidence suggests that imposing LVR caps during booms slows down real credit growth and house price appreciation. One recent study finds, for instance, that tightening LVRs tends to reduce real credit growth by 1–2 percentage points and real house price appreciation by 2–5 percentage points. The latter effect on property prices is, however, not as clear-cut in other studies (CGFS, 2012). While the evidence is generally supportive of the effectiveness of LVR restrictions, it should be noted that LVR restrictions have often been deployed in countries with fixed exchange rate regimes with little discretionary monetary policy capacity, and as part of the micro-prudential framework rather than as macro-prudential interventions.

## **Understanding the transmission mechanisms when macro-prudential instruments are released**

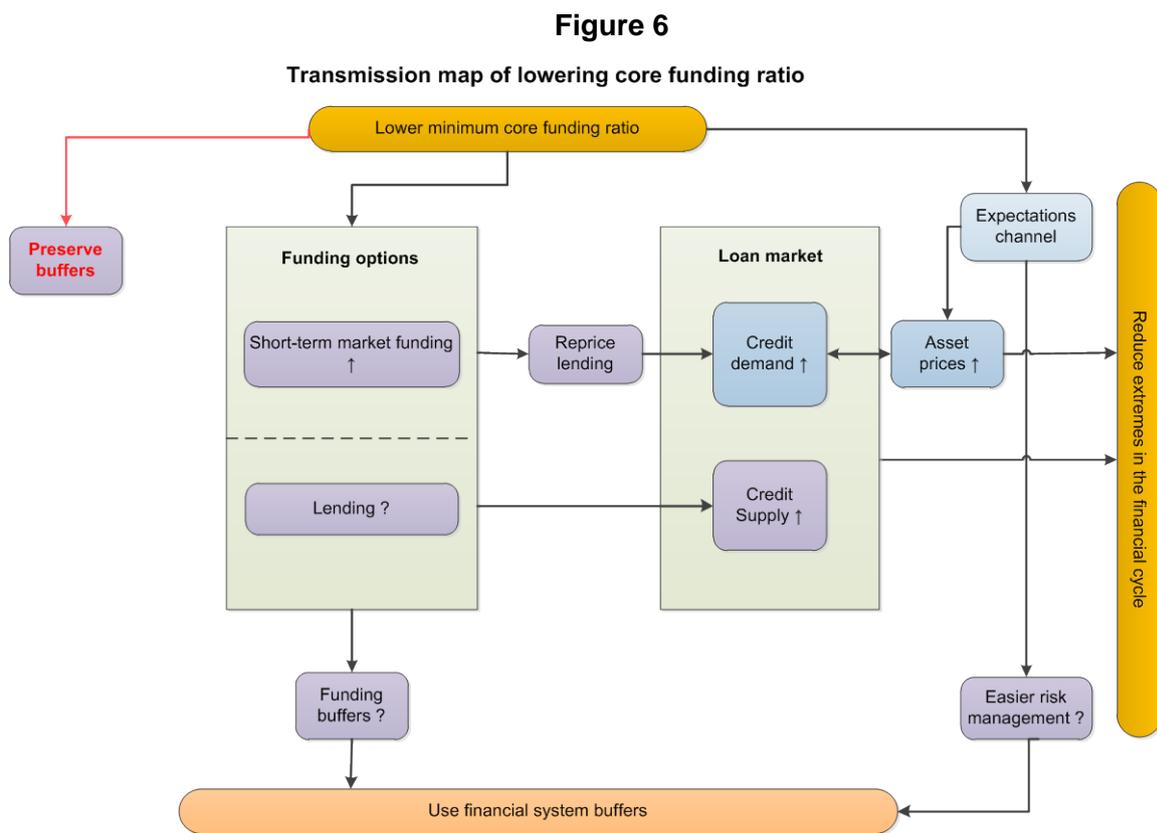
In the release phase, there will typically be a shift in policy objectives. Whereas the focus in the upswing of the financial cycle is on building extra resilience into the financial system and reducing excessive growth in credit and asset prices, in the downswing buffers are expected to be made available to support the flow of lending to the system and/or to absorb actual losses. The goal of mitigating extremes in the credit cycle takes precedence over that of maintaining financial system buffers.

The role of expectations also gains in prominence, reflecting the crucial role of trust and confidence in recovering from crisis events. Release of buffers could have a calming effect if market participants see it as signalling that there will be lower pressure for asset fire sales and deleveraging, and banks are prepared to use the extra loss absorbency. However, there is always the potential for a release to exacerbate the crisis if market participants were to see it as confirming the severity of the situation. Further insight into market behaviour around the release of buffers will only be gleaned as international experience in the use of macro-prudential buffers increases.

As a general principle, macro-prudential requirements should be relaxed in a downswing of the financial cycle to prevent prudential regulation from being procyclical. By removing the need for banks to deleverage for regulatory reasons, macro-prudential easing may help banks to weather losses while maintaining the flow of new lending.

## Lowering the minimum CFR

The objective would typically be to allow banks to use a greater share of short-term wholesale funding, at a time when funding conditions in long-term wholesale markets are judged to be onerous and/or spreads at excessively high levels. Assuring access to funding on reasonable terms would help support the flow of lending to the economy. Figure 6 maps the potential impact of a lower core funding ratio.



- Impact on resilience.** Relaxing the minimum CFR could allow banks to continue lending by running down funding buffers. Funding buffers will fall if banks chose to lower their core funding ratio, either by using a lower share of stable funding or by increasing lending. A CFR release could also help mitigate funding pressures on the banking system, reducing the need for government or central bank support in the form of wholesale debt guarantees or liquidity facilities.

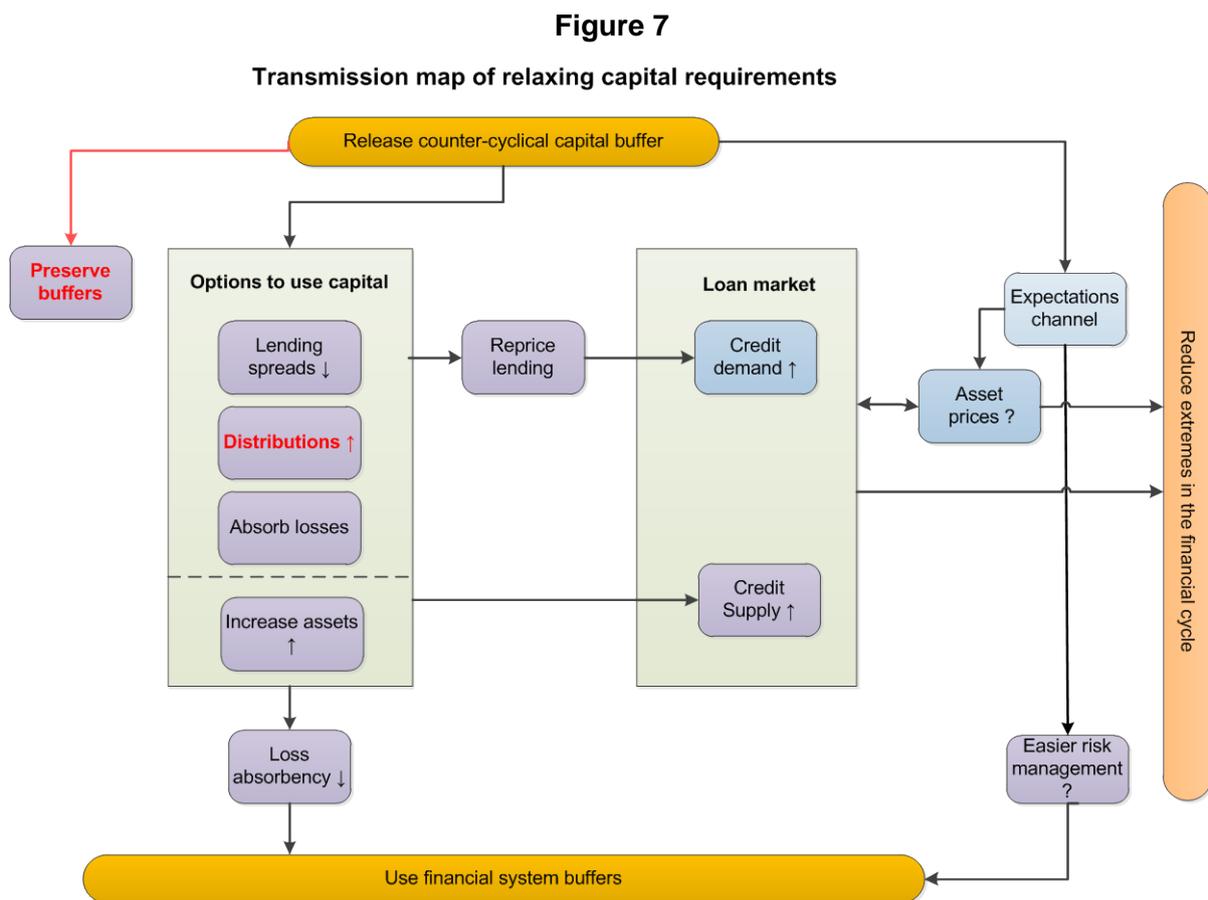
- **Impact on credit cycle.** Where uncertainty around the ability to continue to meet regulatory core funding requirements is affecting banks' willingness to extend credit, the release of the CFR could help counteract this.
- **Expectations-based effects.** Where CFR release mitigates the downswing in the credit cycle, this will also mitigate downward pressure on asset prices originating from expectations of slower credit growth. It could also see banks loosen their funding policies, although this will depend on the balance between banks' short term funding needs and long-term funding strategy.
- **Leakages and potential unintended consequences.** Lowering the minimum CFR may not be effective if banks feel unable to reduce funding buffers due to market pressure, or because of uncertainty regarding the outlook for funding.

## Lowering macro-prudential capital requirements

The objectives of releasing the macro-prudential capital requirement will differ according to whether it occurs in the context of a crisis.

- In a crisis situation, the focus would either be on supporting lending (requiring prompt release) or absorbing losses (where a more gradual release may be appropriate).
- In a non-crisis situation, where credit is slowing in an orderly manner without dramatic financial losses, banks would be encouraged to continue prudent lending, while preserving adequate capital to absorb future losses.

Figure 7 maps the potential impact of easing or removing macro-prudential capital requirements.



Key: purple background – bank reactions; blue background – market reactions; red text – policy leakages;  
bolder lines – stronger effect; dashed lines – significant uncertainty

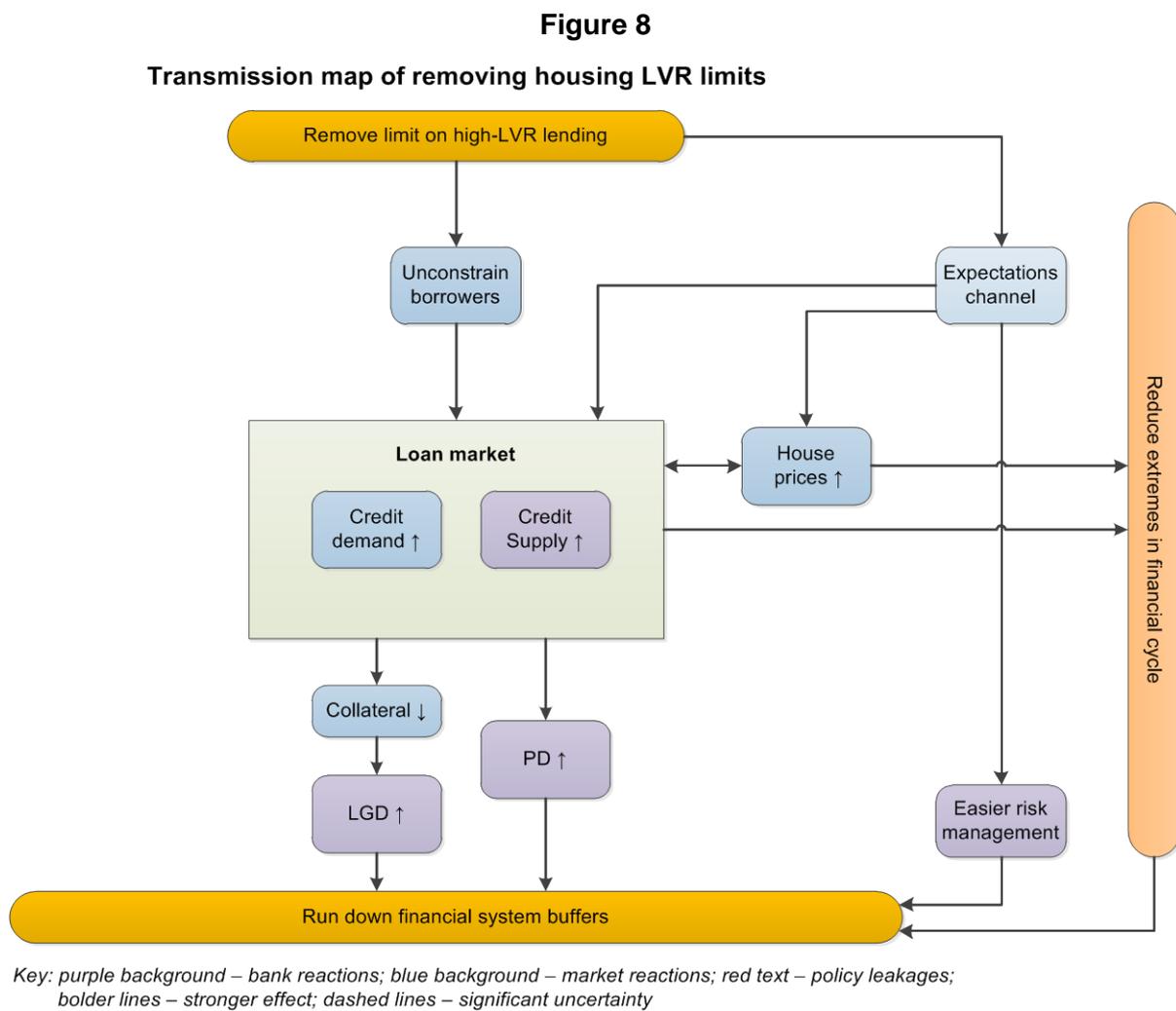
- **Impact on resilience.** Relaxing the macro-prudential capital requirement would allow banks to lend more for a given amount of capital. Where banks are close to their

regulatory minima, an increase in lending could see a material fall in voluntary capital buffers. Alternatively, banks might choose to hold lending steady and reduce capital. There would be no direct impact on resilience if banks opt to preserve their capital buffers. However, there could be an indirect impact if banks interpreted the release as a signal to ease lending standards.

- **Impact on credit cycle.** The easing could help mitigate any downswing in the credit cycle, with capital pressures not forcing banks into a disorderly deleveraging. For sectoral capital requirements (at sector or subsector level), the possibility of banks rebalancing lending across their portfolios increases the uncertainty around the ultimate effect on the credit cycle.
- **Expectations-based effects.** It is difficult to gauge the role expectations will play in the overall transmission; this will in part depend on perceptions of the effectiveness of the tool in achieving its goals. Where the release mitigates the downswing in the credit cycle, this could also reduce downward pressure on asset prices originating from expectations of slower credit growth. However, if asset prices have risen to excessive levels during the boom cycle, releasing the capital requirement too early could create unrealistic expectations around the outlook for credit growth and see asset price inflation take up from where it left off.
- **Leakages and potential unintended consequences.** Removing the capital requirement will not be effective if banks feel unable to reduce buffers due to market pressure, uncertainty regarding future losses or doubts around the likely path of macro-prudential policy.

## Removing high-LVR residential mortgage restrictions

LVR restrictions would typically be removed when there is evidence that housing credit demand has cooled. Unlike the other instruments, easing of LVR restrictions would directly affect the supply and demand for credit, rather than indirectly through pricing effects. Figure 8 maps the potential impact of easing or removing residential mortgage LVR restrictions .



- Impact on resilience.** Removing LVR restrictions could directly affect resilience in two ways: firstly, where it results in a higher share of high-LVR lending, the average collateral on new lending will fall, increasing the likelihood of loan losses in the event of default and also the probability of default. Where the cooling off in the housing credit cycle is also accompanied by falling house prices, LVRs will also rise on the

existing housing portfolio, again increasing the probability of loan losses. Secondly, if the removal of restrictions is taken as a signal to ease lending standards, this could also reduce resilience. However, to the extent that the removal of LVR limits helps mitigate the systemic risk of a disorderly deleveraging and asset price deflation, there should be some offsetting, longer term positive effect on financial system resilience.

- **Impact on credit cycle.** Removing LVR restrictions can increase lending, by providing access to lending markets for marginal borrowers (who have little or no deposit), and increasing the supply of lending by banks, who are no longer constrained regarding deposit requirements. The interaction of increased supply and/or demand for credit could help counter the cyclical downswing, with the effect likely to vary according to the prevailing economic conditions. Expectations of housing market growth and/or easier credit standards could see house price expectations revised upwards, with the normal mutually reinforcing feedback loop to housing lending. However, this will depend significantly on sentiment. A housing market that has seen sharp price falls could weigh heavily on this channel.

The effect may be attenuated in the case of quantitative restrictions rather than outright limits, given the less binding effect. If previously constrained banks increase high-LVR lending, seeing an overall increase in the flow of lending, there will be a positive effect on lending. Demand may also rise if the re-entry of these banks sees them willing to lend to borrowers that were previously screened out.

- **Expectations-based effects.** The high-profile of LVR limits as a tool means that signalling effects are potentially strong. Removing limits could see additional demand from not only previously constrained borrowers, but also vendors who interpret it as presaging greater demand.
- **Leakages and potential unintended consequences.** Key risks around removal of LVR limits are that banks unduly relax their lending standards in a rush to take advantage of new lending opportunities, and that premature removal of the limits results in the housing market picking up where it left off, with the downswing quickly transitioning to a boom. Where household indebtedness is already high, the risks of households becoming overly extended could quickly rise, wiping out any gains from a temporary dampening.

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