
The last financial cycle and the case for macro-prudential intervention

Chris Hunt

This article takes a look back at the last financial cycle that occurred over the previous decade – a cycle that contributed to one of the longest periods of uninterrupted economic growth in New Zealand for the past 60 years. It conducts a counterfactual exercise that maps the Reserve Bank's new macro-prudential policy framework on to financial system developments over the period. It finds that, with the benefit of hindsight, there would have been a compelling case for macro-prudential intervention from 2005 onwards to address a build-up of systemic risk within the financial sector. The temporary increase in capital or liquidity buffers, or the application of loan-to-value restrictions on residential mortgages, would have materially enhanced the resilience of the financial system in the face of developments late in the decade. Macro-prudential intervention may have also tempered credit and asset price developments during the boom itself.

1 Introduction

Private sector debt has expanded markedly over the past decade, along with a sharp increase in prices for residential housing and rural land. The rise in debt served to amplify economic activity and contributed to one of the longest periods of uninterrupted economic growth in New Zealand's post-war history.

Following the global financial crisis (GFC) growth in private sector credit declined sharply with the demand and supply for credit contracting as economic growth slowed. However, the vulnerabilities built up during the boom associated with high levels of indebtedness have not necessarily been "resolved". Households and the rural sector, in particular, will be taking debt levels that still look too high into the next financial cycle, while asset prices (rural and residential housing) continue to look significantly overvalued.

As the Reserve Bank has noted in its regular *Financial Stability Reports* (FSRs) high levels of both domestic and external indebtedness create potential vulnerabilities for the financial system in the event of a sharp downturn in economic conditions or adverse developments in offshore funding markets. International experience during the GFC has illustrated graphically how financial system risks can ultimately culminate in distress for financial institutions and disrupt the real economy.

With these lessons in mind, the Reserve Bank has been bolstering the regulatory framework over the past

few years to improve the soundness and efficiency of the financial system. This has come through changes in the "baseline" (or micro) prudential settings associated with Basel III,¹ together with the development of a new "macro-prudential" policy framework designed to address financial system risk that varies with the broader economic cycle.

A Memorandum of Understanding has recently been signed between the Minister of Finance and the Governor of the Reserve Bank formalising the objectives, instruments and governance arrangements for the new macro-prudential framework.² As discussed in the *Final Policy Position* paper, the following prudential instruments can be deployed to promote greater financial system resilience and/or to reduce the prospects of such risks from developing by dampening the credit cycle:³

- A counter-cyclical capital buffer (CCB);
- Adjustments to the core funding ratio (CFR);
- Adjustments to sectoral capital requirements; and
- Quantitative restrictions on the share of high loan-to-value (LVR) loans to the residential property sector.

¹ For an overview of the new Basel III regulatory regime see chapter 6 of the May 2012 Financial Stability Report.

² The Memorandum of Understanding (MoU), signed 16 May, follows a public consultation on the proposed framework for macro-prudential policy during March and April of this year. The consultation document and accompanying background paper, together with the MoU can be found here: http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/

³ See http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/5270425.pdf

This article takes the Reserve Bank's new macro-prudential policy framework and looks back at the last financial cycle. It asks the questions: if a macro-prudential framework was in place over the past decade would there have been a compelling case for macro-prudential intervention, and if there was, when might we have deployed any of the instruments (or combinations of instruments) in the policy toolkit. It also discusses when any of the tools may have been "released" or turned off had they been used.

Any attempt to consider a counterfactual policy environment to that prevailing in the past is clearly artificial and assumptions must be made as to how policymakers would have behaved had current policy frameworks and perspectives been in place. Moreover, policymakers around the world did not know a global financial crisis was on the horizon and therefore did not have the benefit of hindsight that the subsequent events have given us. These caveats suggest that we should be somewhat modest in terms of the insights we can learn from this counterfactual analysis. This is particularly true in regards to any overall assessment of the effectiveness of macro-prudential intervention over the last cycle.

The remainder of the article is divided into two main sections. The first provides an overview of the last financial cycle, including the presentation of some stylised facts, identification of the key drivers and a summary of how the Reserve Bank saw the evolution of financial system risks and vulnerabilities at the time. The second section attempts to map the new macro-prudential policy framework on to financial system developments over the last decade. This mapping involves a counterfactual systemic risk assessment using some of the key macro-prudential indicators (MPIs) that now form part of the policy framework. This is followed by an assessment of the case for macro-prudential intervention and instrument selection. It also discusses how some of the tools may have been applied, together with when they might have been released.

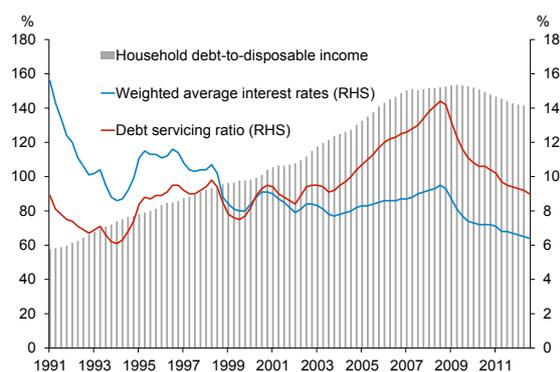
2 The last financial cycle – an overview

2.1 The starting point – an “indebted people”⁴

Financial cycles can be parsimoniously described with reference to credit and housing market developments (Borio 2012). On this basis, the last financial cycle was slightly longer and with a greater amplitude than the credit and asset price cycle over the 1990s. This broadly coheres with the last business cycle (proxied by real GDP) which was also longer than the 1990s cycle and in fact the most sustained in New Zealand's post-WWII history (Chetwin 2012).

New Zealand's last financial cycle, which we date from 2001 as credit and house price growth started to turn upwards, began from a starting point of high household and external indebtedness – a legacy of the previous financial cycle over the 1990s. The increase in household debt (figure 1) mirrored by an increase in external indebtedness (figure 2), was already providing concern for the Reserve Bank about future resilience to economic shocks (Brash 2002, Woolford 2001).

Figure 1
Household debt and debt servicing



Source: RBNZ.

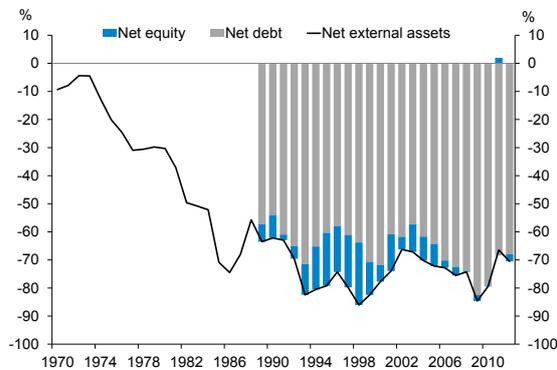
Note: The debt servicing ratio is total interest payments relative to disposable income. The weighted average interest rate is calculated as interest payments on housing and consumer loans divided by total value of housing and consumer loans.

At the time however, the banking system was considered well capitalised. There were no legacy issues related to declining asset quality arising from the end of

⁴ “An indebted people” refers to a speech former Reserve Bank Governor Don Brash gave to the Canterbury Employers’ Chamber of Commerce in early 2002.

the previous economic cycle in the late 1990s, and bank profitability was improving. That said, the role that banks played as the conduit enabling foreign savings to fund domestic investment was clearly identified as the Achilles heel of the financial system (Woolford 2001). However the banking system's systematic hedging of its external borrowings, meant it was essentially funding in New Zealand dollars (NZD) and thus not at risk in the event of a significant NZD depreciation.

Figure 2
Net external assets
(percent of GDP)



Source: Statistics New Zealand.
Note: Data prior to 1989 comes from a dataset compiled by Lane and Milesi-Ferretti and published in the May 2011 *Financial Stability Report*.

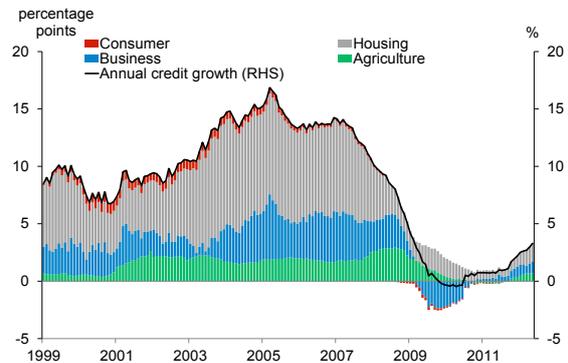
2.2 Stylised facts

The cycle in nominal private sector credit growth lasted just over nine years which we date from April 2001 to September 2010 when growth troughed at -0.5 percent in annual terms. Over this period average annual credit growth was 10 percent with a peak annual growth rate of 17 percent in August 2005. The previous nominal credit cycle lasted about eight years (April 1993 to March 2001) with average annual growth of 9.5 percent and a similar peak of 16 percent.

By 2004 credit growth was fairly broadly based with all sectors experiencing annual growth rates in excess of 10 percent. The first sector to see an acceleration in credit growth was agriculture, with favourable export prices and a low exchange rate in the late 1990s and early 2000s supporting incomes and an increase in leverage. The percentage point increase in the contribution to aggregate credit growth from the rural sector is significant (figure 3)

and the sector increased its share of intermediated (bank and non-bank lending) credit outstanding from around 10 percent in 2000 to 13 percent in 2003.

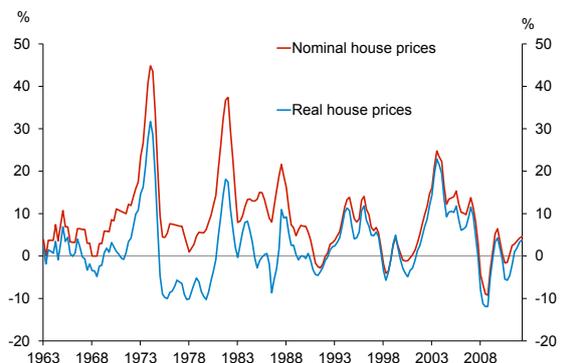
Figure 3
Private credit growth by sector
(contribution to annual growth)



Source: RBNZ *Standard Statistical Return (SSR)*.
Note: Private sector credit refers to lending intermediated by banks and non-bank lending institutions.

The New Zealand house price cycle over the 2000s, like the credit cycle, was longer than in the 1990s. Figure 4 shows the annual growth of nominal and real house prices since the late 1960s. In the more recent low inflation environment real and nominal house prices movements are broadly the same. In the 1970s and 1980s however, high inflation often masked real house price declines.

Figure 4
Real and nominal house prices
(annual percent change)



Source: QV Ltd, Statistics New Zealand; RBNZ calculations.
Note: Nominal QV house price series deflated using headline CPI.

The most recent house price cycle saw the largest trough-to-peak increase in real house prices (87 percent) across the seven real house price cycles we have

Table 1
Real house price cycles since 1970

	1970Q1- 1980Q4	1981Q1- 1982Q4	1982Q4- 1985Q2	1987Q1- 1989Q3	1992Q3- 1995Q2	1995Q3- 1998Q3	2001Q3- 2009Q1	Average
Length of cycle (years)	11	2	2.5	2.75	3	3.25	7.75	4.6
Expansion (quarters)	19	6	6	9	10	10	24	12
Contraction (quarters)	25	2	4	2	2	3	7	6.4
Price change – upturn (%)	63	24	9.8	15	18	18	87	34
Price change – downturn (%)	-39	-1.8	-2.8	-1.7	-0.1	-7	-14	-9.3
Average annual growth (%)	0.7	10	3	3	5	5	7	5
Peak annual growth (%)	32	18	8	11	11	12	23	16

Source: QV Ltd, Statistics New Zealand; RBNZ calculations.

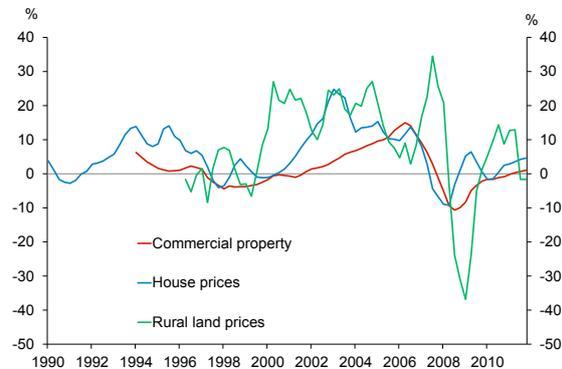
Note: Real house price cycles are defined by at least 2 consecutive positive quarters. End of cycle defined by at least 2 consecutive negative quarterly outturns.

identified for the period since 1970 (table 1). The last cycle is also the second longest since the 1970s. Similarly, the correction in house prices was the second largest on record, although a lot shorter and less severe than the long drawn out correction that characterised the end of the 1970s house price boom.

The dramatic rise in house prices over the last cycle (120 percent in nominal terms) increased the underlying collateral value against which banks and other intermediaries would lend to borrowers and is likely to have reinforced borrowers' access to credit and hence the overall growth in credit. In addition, there were the wealth effects of rising house values which fed through to consumption, while "realised" gains in wealth were also reflected in mortgage equity withdrawal – owners increasing their mortgages on their current property, or selling the property itself (Bollard *et al* 2006).

The sectoral credit developments described above were also reflected in asset price inflation (figure 5). Rural land prices increased rapidly in the early part of the decade, followed by residential house prices and a more subdued increase in commercial property prices.

Figure 5
Property price growth
(annual percent change)



Source: IPD, REINZ, QV Ltd.

Note: The IPD series is a capital return index and replaces the QV Ltd semi-annual commercial property price series that is no longer available.

2.3 Key drivers of the last financial cycle

The stylised facts on the last financial cycle presented above are the result of a complex interaction between a number of key driving and enabling factors. These factors are more fully explained in the Reserve Bank's recent review of the last business cycle (Chetwin 2012, Chetwin and Reddell 2012).

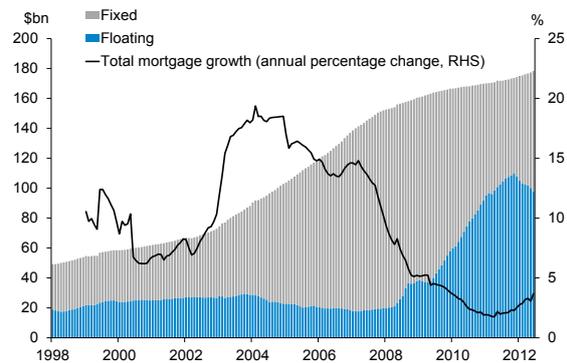
In short, an unexpected surge in net migration over 2001, and a supportive interest rate environment following monetary policy “insurance cuts” in the face of perceived risks to global growth in the early part of the decade laid the foundations for a sustained expansion in house prices and household net worth. While net migration returned to more normal levels over 2003, robust employment and income growth, coupled with a self-reinforcing house price expectation dynamic that was influencing borrower behaviour, helped to continue the momentum in the housing market.

In addition, specific features of the interest rate environment accentuated both the housing market and the financial cycle in general. These included lower offshore borrowing costs for New Zealand banks as confidence in the global economy picked up from 2004; lower long-term interest rates relative to short rates which prompted borrowers to shift to fixed rate mortgages (figure 6) thereby reducing the efficacy of monetary policy tightening over the cycle; and increased competition between banks in the fixed rate mortgage lending area, particularly over 2006 and 2007.

One consequence of banks competing more intensely for residential mortgage lending is often a decline in lending standards. The worst loans are typically made in the best of times, and the relaxation of lending standards is a fairly typical late-cycle phenomenon. The Reserve Bank began documenting this development in the May 2005 *FSR*, noting anecdotal evidence of lending on less traditional terms. The Reserve Bank’s concern increased over time, and in the May 2007 *FSR*, data especially requested from the banks was published to test our concerns about lending standards. This data confirmed lending standards had been materially relaxed (see figure 18 and the associated discussion for more details).

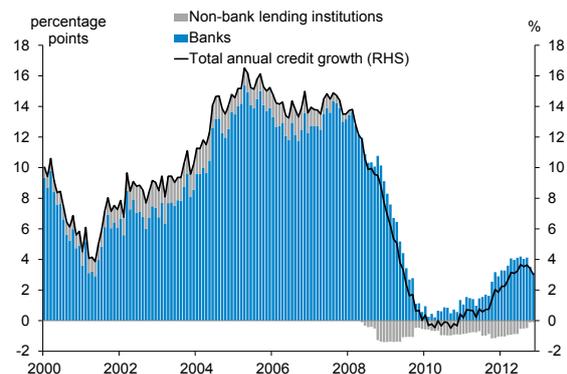
The non-bank lending sector, while a small part of the New Zealand financial system, also helped to drive developments over the last financial cycle. The sector grew rapidly in the early part of the 2000s, relative to the banking system, increasing its share of total intermediated credit from just over 5 percent in 2000 to nearly 9 percent at its peak in 2006.

Figure 6
Bank mortgage lending



Source: RBNZ.

Figure 7
Bank and non-bank lending
(contribution to annual growth)



Source: RBNZ SSR.

The sector operated in various niche lending areas that struggled to obtain bank funding, and was particularly active in supporting construction projects, often in the form of mezzanine financing. Finance companies competed aggressively in the property development sector, lending on more marginal and riskier housing projects which ultimately sowed the seeds of failures within the sector from 2006.

2.4 From boom to “softish” landing

Economic activity contracted for six quarters from the first quarter of 2008 through to the second quarter of 2009. The oil price spike over 2007, the accumulated impact of a strong exchange rate and several years of monetary policy tightening help explain the initial step down in growth. Global financial market disruptions over 2008 reflecting troubles with specific institutions and a

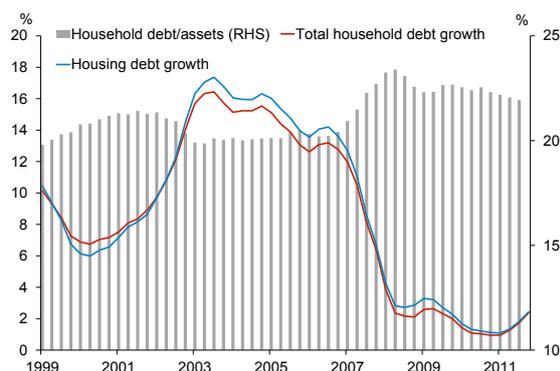
broader decline in financial market sentiment, together with a sharp deterioration in global growth, explain the subsequent profile of economic activity in New Zealand over the recession.

Global financial market developments over 2007 and 2008 demonstrated that the concerns about the offshore funding of the banking system had been justified, with the banking system needing liquidity support from the Reserve Bank as well as some government guarantees of their term debt borrowing. However, the banking system weathered the crisis comparatively well, with manageable losses, partly because the liquidity support provided breathing space for the banks to work with troubled customers. The ultimate impact on household and rural balance sheets might have turned out far worse if key global trading partners had not started to recover when they did, or if local banks had been forced to deleverage more actively.

Private sector credit growth slowed and troughed in annual terms at -0.5 percent in 2010 as lenders re-assessed the credit-worthiness of borrowers, and borrowers themselves attempted to restructure their balance sheets and “deleverage” even after economic activity began to pick up from the third quarter of 2009. This was most prevalent in the business sector. Finance company failures, beginning in 2006, also contributed to the decline in credit by reducing access for the more marginal property developments.

Households saw their wealth decline as nominal house prices fell 9.8 percent from the fourth quarter of 2007 to the trough in early 2009. This represents a fairly mild correction relative to the international experience (and the experience of New Zealand in the late 1970s) – but no doubt the correction could have been worse had unemployment spiked higher or if emerging market growth had not recovered as it did. The household debt-to-income ratio fell 11 percentage points from a peak of 153 percent in the second quarter of 2009 to 142 percent in the first quarter of 2012 (refer back to figure 1), as demand for housing credit declined (figure 8) and households increased principal payments in a low interest environment. A decline in household borrowing costs helped smooth this adjustment.

Figure 8
Household debt growth and ‘leverage’



Source: RBNZ.

2.5 The Reserve Bank’s view of financial system risks

Throughout the period the Reserve Bank was concerned with the risks to the financial system from a starting point of what appeared to be a high level of external indebtedness and household leverage – both of which were a legacy of the cycle over the 1990s. Initially, the Reserve Bank considered the increase in house prices to be a process driven by economic fundamentals, related to net migration flows and the typical lags in housing supply. From 2003 the Reserve Bank became increasingly concerned by an expectations dynamic that was starting to become entrenched, first among investors, and then more generally among households banking on future increases in house prices and consuming on the basis of their perceived increased in net wealth. The Reserve Bank’s concern with growing financial system risk was expressed in a number of speeches, bulletin articles and from 2004, the publication of the semi-annual *Financial Stability Report*.

Signs of a decline in bank lending standards from 2005, and growing competition between banks, reinforced concerns over household balance sheets and the associated credit risks this posed for the banking system. Competition between banks was particularly fierce in the 2-year fixed mortgage space, with the margin between the 2-year mortgage rate and the 2-year swap rate declining materially over the course of several “mortgage wars” in 2004 and over 2006/2007. There was also a late cycle concern with growing risks in the agricultural sector.

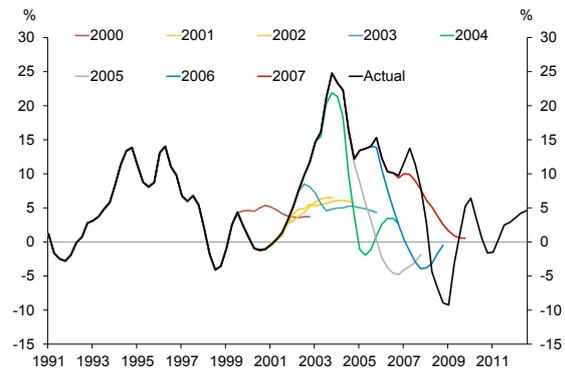
However, throughout the period the banking system was viewed as generally sound and able to withstand a material shock to its financial position, given strong capital buffers, generally prudent risk management and good asset quality. The major vulnerability for the financial system was the funding risks arising from the banking system's reliance on offshore short-term wholesale funding.

The Reserve Bank and external commentators were consistently surprised by the strength of the financial cycle and economic activity throughout the period until late 2007. As evidenced in both *Monetary Policy Statements* (MPS) and *FSRs*, economic activity was expected to soften due to declining net migration, pipeline monetary policy tightening from 2003, high household debt and increasing debt servicing ratios that would eventually start to bite. The steady increase in oil prices to 2006 was also expected to eat into household disposable income.

For example, figure 9 highlights the Reserve Bank's internal projections for house prices prepared as part of the March *Monetary Policy Statements* over the course of the expansion. These forecasts consistently assumed a correction in house prices.

In hindsight monetary policy – the only policy lever available at the time to address cyclical economic pressure – was too slow in responding to resource and associated inflation pressure and was not effective in materially leaning against the financial cycle (Chetwin and Reddell 2012). Concern over the appreciating exchange rate also acted to constrain the Reserve Bank in its ability to respond to pressure emanating from housing.

Figure 9
House price forecasts during the expansion



Source: QV Ltd, RBNZ.
Note: Forecasts taken from the internal projections of the March *Monetary Policy Statements* for each given year.

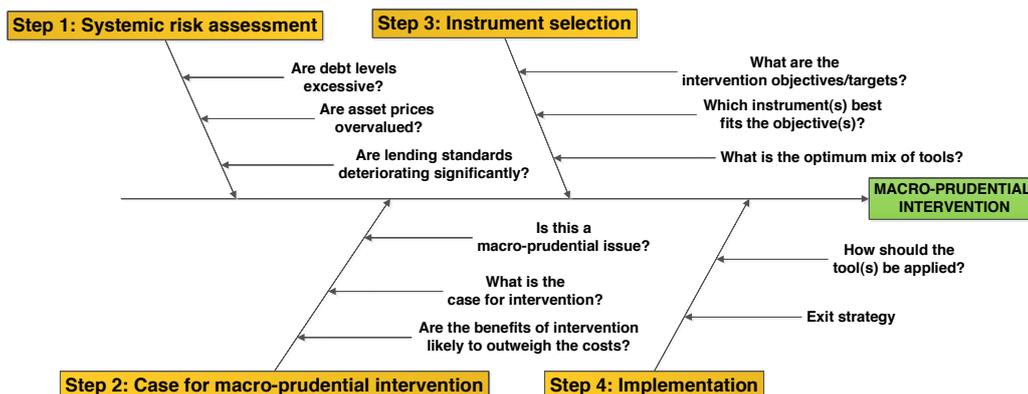
3 Mapping the macro-prudential framework to the last financial cycle

As discussed in the *Final Policy Position* paper (RBNZ 2013a) the Reserve Bank sees key four key steps in the macro-prudential policy process (figure 10).

3.1 Systemic risk assessment

The risk assessment process focuses on whether debt levels and asset price imbalances, are, or may be becoming excessive, and whether lending standards may be deteriorating. Internally the Reserve Bank examines a range of quantitative and qualitative information in a quarterly Macro-prudential Indicator (MPI) report to help assess whether there is a case for macro-prudential

Figure 10
The macro-prudential decision framework

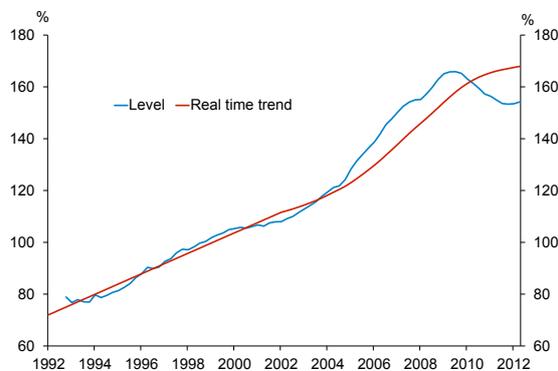


intervention. The overall assessment (and relevant indicators) is beginning to be published in the semi-annual *FSRs* as part of the evolving communication strategy associated with the new policy framework.

Looking back at the last financial cycle, many of the measures of systemic risk we now employ as part of the macro-prudential policy framework, all else equal, would have signalled a growing concern with financial system imbalances and vulnerabilities – particularly from 2005 onwards.

In terms of aggregate private sector credit developments, annual credit growth peaked in early 2005 at 17 percent, and remained above 10 percent until late 2008. The ratio of private sector credit-to-GDP peaked in mid-2009 at around 165 percent (figure 11) and has since corrected by around 10 percentage points in the wake of subdued credit growth over the past few years. The level of credit-to-GDP began materially diverging from its underlying trend from 2004. This “real time gap” – an aggregate measure of excess credit relative to GDP – is also illustrated in figure 12. Research by the Basel Committee for Banking Supervision (BCBS) suggests a credit-to-GDP gap of more than 2 percent should prompt policymakers to consider the case for macro-prudential intervention, and a gap of 10 percent is a reasonable point to fully impose relevant macro-prudential tools.

Figure 11
Aggregate private sector credit
(percent of GDP)

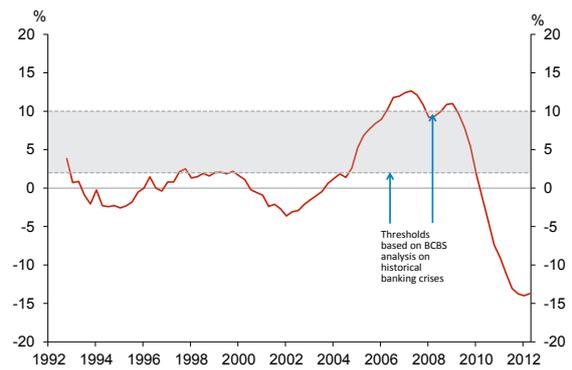


Source: RBNZ.

This increase in private sector credit was mirrored by an increase in net external liabilities over the period. Net external liabilities as a percent of GDP increased from 66 percent in 2002 to just under 85 percent in early

2009 (refer back to figure 2). The banking system was the primary conduit for the intermediation of foreign savings to domestic borrowers. The benign global financial market conditions from 2003 until 2007 allowed New Zealand banks to borrow relatively cheaply, mainly in the form of short-term wholesale debt.

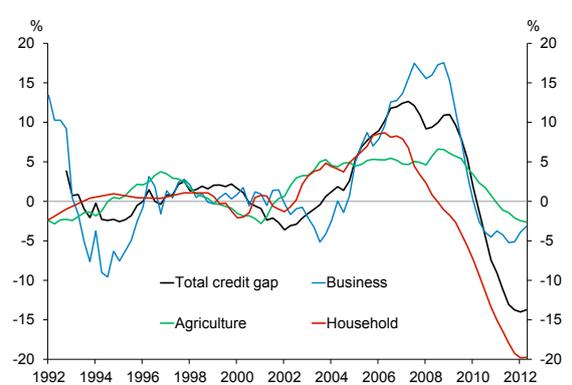
Figure 12
Aggregate private sector credit-to-GDP gap



Source: RBNZ.

As mentioned in section 2, the aggregate credit picture masked some variation across sectors, with agricultural and housing credit growth starting to look “excessive” over 2002.⁵ A significant gap between business credit relative to operating surplus, and its trend, starts to open up by early 2005. The business sector subsequently registered the largest divergence between the level of credit-to-income and the underlying trend (figure 13).

Figure 13
Sectoral credit gaps



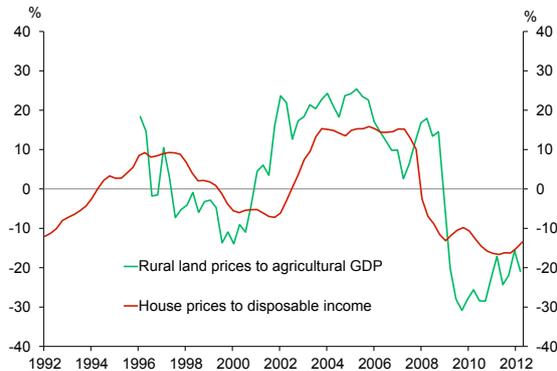
Source: RBNZ.

Note: The gaps are calculated relative to GDP for total credit; gross operating surplus for business credit; a measure of agricultural GDP for agricultural credit; and disposable income for household credit.

⁵ Note the performance of sectoral credit gaps is less robust than the performance of the aggregate credit gap as a harbinger of future financial system stress.

The sectoral asset price picture broadly matches the sectoral credit one (figure 14). “Overvaluation” in rural land prices relative to a measure of rural income occurs earlier than in the housing sector.

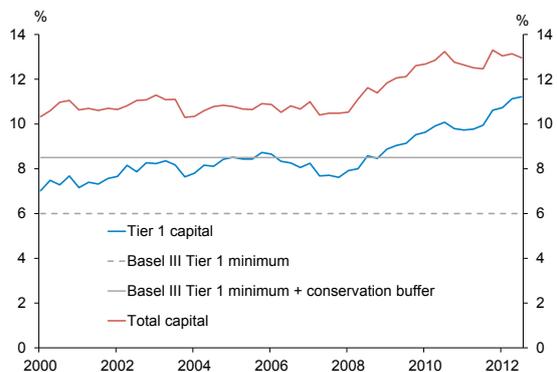
Figure 14
Asset price gaps



Source: RBNZ.

As noted earlier the banking system performed well throughout the last financial cycle, with capital buffers built up during the boom (on the back of rising profitability) able to absorb the sharp increase in non-performing loans over 2008 and 2009. However, while actual capital ratios were above Basel I and Basel II minima (4 percent Tier 1 capital), the actual level of Tier 1 capital that prevailed over the period would have had to increase further to comfortably meet the new Basel III Tier 1 minimum of 6 percent that came in to effect at the start of this year, and the 2.5 percent conservation buffer that will come in to effect at the start of 2014 (figure 15).

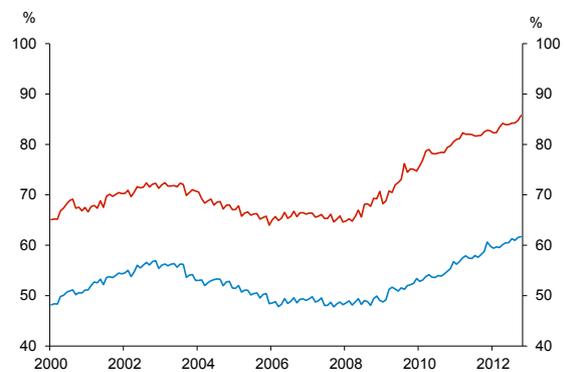
Figure 15
Capital ratios
(locally incorporated banks, percent of risk-weighted assets)



Source: Registered bank General Disclosure Statements (GDS).
Note: The Basel III capital ratios are not strictly comparable to Basel I or Basel II levels, since Basel III embodies a tighter definition of capital.

The key risk that crystallised for the New Zealand banking system over the course of the global financial crisis was that related to the funding of bank balance sheets. Over the last cycle banks were able to respond to increased borrower demand for credit by drawing from less stable shorter-term forms of funding. As figure 16 illustrates, the share of lending accounted for by stable funding (capital, retail deposits and wholesale funding with more than a year to maturity) declined from late 2002 through to 2007.

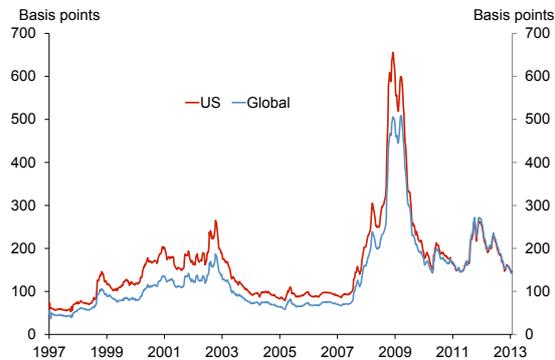
Figure 16
Retail and core funding ratios
(percent of lending)



Source: RBNZ SSR and RBNZ prudential liquidity return.

The ability of banks to accommodate domestic growth reflected the ease at which the major banks were able to access global funding markets and the decline in risk premia more broadly which was a function of the positive global economic outlook. There was a marked fall in global risk premia between 2003 and 2007, proxied in figure 17 by corporate bond spreads. By 2006 commentators were suggesting that risk was being under-priced globally, with increasing prominence being directed towards the opaqueness of structured financial products – a point the Reserve Bank began noting in the May 2006 FSR.

Figure 17
Corporate bond spreads
(relative to government bonds)

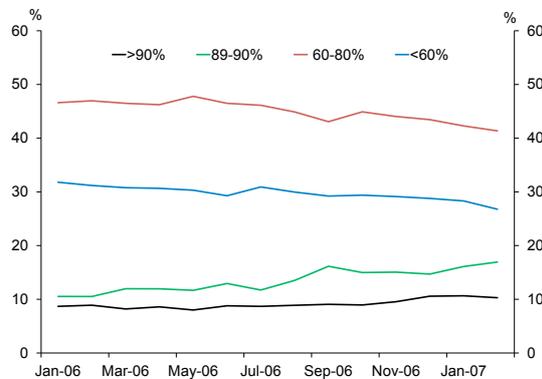


Source: Bloomberg.

As discussed earlier the Reserve Bank also identified a material decline in lending standards towards the end of the boom phase. Anecdotal reports of “low doc” and high LVR lending were first noted back in 2005. From this point the level of the Reserve Bank’s concern grew, particularly in the context of heightened bank competition over 2006 which served to compress margins.

The Reserve Bank was sufficiently concerned with reports of lower lending standards that it requested additional data on banks’ lending by LVR in early 2007. The data confirmed an increase in high-LVR lending (figure 18), while some banks’ lending policies also suggested a relaxation of non-price criteria (e.g. income requirements).

Figure 18
Proportion of new lending by LVR bucket
(big-4 banks)



Source: RBNZ.

The Reserve Bank also spoke directly to bank CEOs and Chairs to express concern about the relaxation in lending standards and the scramble for market share. The

banks agreed that this was an issue and that competitive pressure – behaviour individual banks claimed was driven by “other” banks and the non-bank sector – had led to unsustainably low lending margins.

The Reserve Bank also attempted to inform the public about possible “speculative” behaviour taking hold in the market, through speeches and other public communication. Although it was initially thought to be confined to investor housing, by 2005 the Reserve Bank was pointing out the more general unrealistic expectations of households for future house price increases (Bollard 2005). The prevalence of property-related TV shows and investor seminars further hinted at the buoyancy of the housing market and irrational exuberance taking hold.

In the context of the present counterfactual exercise the systemic risk assessment implied by our current MPIs would have suggested the need to seriously consider deploying macro-prudential instruments from around 2005 onwards:

- Credit growth looked “excessive” both in aggregate and sectoral terms;
- Asset prices appeared very frothy, and possibly “overvalued”, with speculative activity apparent in the investor housing segment in particular;
- Household balance sheets looked stretched and increasingly vulnerable to either a significant correction in house prices and/or a sharp increase in interest rates;
- Funding risks had increased as banks sourced a growing share of short-term funding from the cheap and plentiful stores of global funding markets, in an environment where global risk premia appeared very low; and
- There were growing concerns over a reduction in lending standards that helped to drive competition between banks for mortgage market share. There was also the competition coming from the non-regulated non-bank sector, which also helped to support the growth in private sector credit.

3.2 Weighing up the case for macro-prudential intervention

Step two of the decision framework for macro-prudential policy considers whether a macro-prudential intervention is the appropriate response to the build-up of systemic risk that has been identified in the first step. The existence of financial imbalances might not warrant a macro-prudential response, if financial system risk could be better addressed through other policies.

In terms of the broader assessment of whether other policy settings were helping to drive systemic risk, the Reserve Bank has had a longstanding concern around the (lack of) responsiveness of housing supply, and tax-related biases that favour housing as an investment asset (RBNZ 2011). However in the context of cyclical developments it is likely the Reserve Bank would have had to take these structural features underpinning the housing market as a given. Policy changes in these areas take a long time to be formulated and subsequently implemented.

With the benefit of hindsight some of the Reserve Bank's prudential settings could have been tighter, which could have helped lean against the build-up in financial system risk over the period. For example, there was no prudential liquidity policy in effect, which given New Zealand's low savings rate, enabled an over-reliance by banks on funding credit demand through wholesale funding. Had the current policy been in place the funding profile of banks would have evolved somewhat differently, with banks less exposed to short-term money markets at the time global financial markets became paralysed. In addition had Basel III been in place over the last cycle, banks would have had a higher level of loss absorbing capacity associated with a tighter definition of Tier 1 capital and higher minimum capital requirements.

However, even with the current post-crisis micro-prudential settings in place over the last decade it is likely that credit and asset prices would have evolved in a broadly similar fashion to what actually transpired.

Another issue worth mentioning is the perimeter of prudential regulation. The ability of the non-bank sector to support the buoyant credit and asset markets over the period would have arguably been more constrained had the current non-bank deposit-taking regime been in place,

even assuming macro-prudential instruments were not used within the sector.

In summary, there was, with the benefit of hindsight, a sufficient case for macro-prudential intervention. Systemic risk assessment through a macro-prudential lens would have found sectoral imbalances that emerged early in the cycle, and become generalised at the system level by 2005. This assessment largely takes as a given the credit and asset price developments over the period. It should be noted that with the current micro-prudential environment mapped back to the past cycle – Basel III, the liquidity policy, the non-bank regime – developments may have unfolded differently. However, it is not clear what material difference the current micro-prudential regime would have had in terms of attenuating the credit and asset price imbalances built up over the boom period *per se*. Moreover, as noted earlier, monetary policy could in principle have played a greater role in addressing credit market imbalances, albeit in a manner constrained by PTA obligations surrounding the exchange rate.

3.3 Instrument selection

The third step concerns the choice of specific instruments based on whether financial imbalances are generalised or specific to a particular sector, together with consideration of the optimal mix of tools required to address growing financial system risk.

With a view that financial imbalances had become fairly generalised by late 2004, and enabled by cheap foreign funding, it is likely that the CCB, possibly in conjunction with adjustments to the CFR, could have been usefully employed. These two instruments build the resilience of the banking system to any subsequent period of stress by increasing capital and liquidity buffers respectively. At the margin, these tools might also have the added benefit of dampening the upswing.

While financial imbalances were fairly broad-based, certainly by 2005, the Reserve Bank could also have considered deployment of sectoral tools. One possibility would have been to follow the aggregate tools discussed above with residential LVR restrictions in order to focus more specifically on the housing sector. The application of LVR restrictions may have been appropriate in the context

of the decline in lending standards over 2006 and 2007. Sectoral tools could also have been deployed in response to much earlier signs of imbalances, perhaps over 2003 or early 2004 in the housing or agricultural sectors.

In terms of tools selection and the objectives of macro-prudential intervention the initial motivation would have been primarily around building financial system resilience. The deployment of the CCB, adjustments to the CFR and sectoral capital requirements (on their own or in some combination) would speak to this objective. The Reserve Bank has expressed some reservations about the above tools' ability to attenuate the upswing of the credit cycle. Back of the envelope calculations by both Ng (2008) and Ha and Hodgetts (2011) for example, suggest a modest impact on the cost of bank funding and hence credit growth from time-varying capital requirements. Ha and Hodgetts (2011) also draw a similar conclusion in relation to the CFR.

The more intrusive nature of LVR restrictions suggests a somewhat greater ability to impact the credit upswing. However, this tool comes with arguably greater efficiency and equity costs, relative to the other instruments.

3.4 Policy implementation and the release of the tools

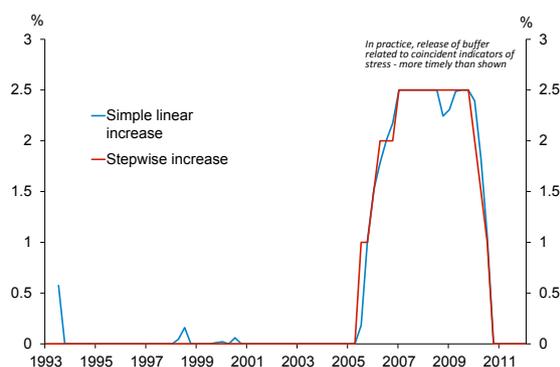
This step in the framework concerns how any of the specific tools should be applied and how any tool would be released or turned off. We consider the stylised application of a CCB below, based on suggestions from the BCBS about how the tool should be applied. This is even more speculative than the previous section, and actual policy choices could have been substantially different.

The choice variables in relation to the deployment of a CCB concern the notice period and the buffer maximum. The *Final Policy Position* paper states that the notice period – the time allowed for banks to adjust their regulatory capital ratios – can vary up to 12 months. The paper also states that the typical buffer maximum will be 2.5 percent of common equity.⁶ Figure 19 maps the credit gap shown in figure 12 and BCBS advice about how to use the gap to deploy the CCB, to the deployment of a CCB over 2005.

⁶ Note, common equity is part of Tier 1 regulatory capital.

Assuming a 12 month notice period, and a progression of stepwise increases, the buffer would have reached its 2.5 percent maximum in the second quarter of 2007.⁷

Figure 19
Stylised counter-cyclical capital buffer
(12 month notice period, percent of risk-weighted assets)



Source: RBNZ calculations.

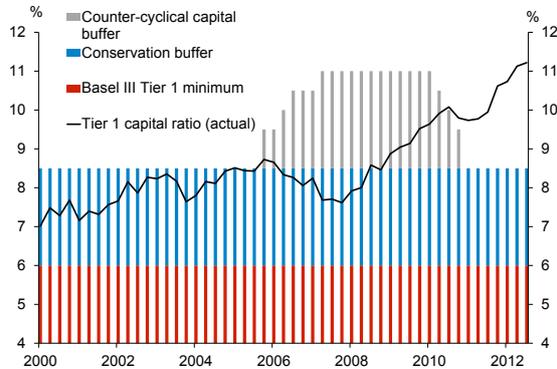
Figure 20 compares actual Tier 1 capital ratios of the locally incorporated New Zealand banks relative to Basel III minimums (had they been in place) and the CCB calculated in figure 19. Banks would have had to increase their Tier 1 capital in the period prior to 2005 to comfortably meet the regulatory minimum and the conservation buffer. The imposition of a CCB would have forced additional capital raising and/or a reduction in risk-weighted asset growth.

The prospect of “leakage” of credit to other lenders would have been a very real possibility had the Reserve Bank imposed a CCB in 2005, particularly in the context of the unregulated non-bank sector at the time. Assuming reciprocity arrangements had been in effect, there would likely have been little or no shift in lending to foreign bank branches operating in New Zealand, since the home regulator would have been obliged to institute the 2.5 percent CCB on their banks exposed to the New Zealand market.⁸

⁷ We also assume the first move is a 1 percent increase. In addition, a 2.5 percent maximum is shown for illustrative purposes. National jurisdictions reserve the right to impose a higher buffer than the BCBS recommendation.

⁸ Reciprocity refers to the arrangements built into the Basel III CCB regime, where regulators of banks operating as branches in other jurisdictions (or lending directly cross-border) are required to meet the host regulator’s CCB requirements. This is designed to create a level playing for all banks operating in a given jurisdiction.

Figure 20
Counter-cyclical capital buffer and actual Tier 1 capital
(percent of risk-weighted assets)



Source: GDS; RBNZ calculations.

Any shift in lending to institutions not subject to the CCB would tend to mitigate any impact of the policy on credit growth, but the CCB would still be successful in making the core of the financial system more resilient. The Reserve Bank has also noted that a CCB could be extended to non-bank deposit takers in the future.

In a downturn, removing any temporary capital or liquidity buffers, or the unwinding of LVR restrictions is primarily designed to lean against financial stress and help prevent a significant contraction of economic activity. Releasing capital buffers will help banks absorb losses while helping to support lending to credit-worthy borrowers. Similarly, removing the constraint on lending imposed by LVR restrictions will also remove a regulatory constraint that would be unhelpful from a system-wide perspective during a period of stress. Normalising the level of the funding-liquidity buffer to its micro-prudential minimum would recognise the difficulties associated with raising expensive forms of stable funding – particularly term wholesale funding – in the event of disruptions to funding markets, when the cost of funding and possibly access may be compromised. This could prevent the banking system from having to meet an onerous CFR requirement through a material contraction in lending or Reserve Bank liquidity support.

The growing concern with New Zealand banks' ability to access offshore funding over the course of 2007 and the initial response by the Reserve Bank in August of that year to ease market liquidity pressures, suggests

any CFR buffer in place would have been first released, relative to any other instrument. A gradual release of the CFR may have been appropriate in this context, as it was not clear at the time what the nature or magnitude of the global financial economic shock was. The renewed bout of financial market turbulence associated with the failure of Lehman Brothers in September 2008, suggests complete removal by late 2008 would have been likely.

In terms of releasing any capital buffers, had they been in place, it is likely this may have been undertaken in early 2009, or possibly late 2008. In the 2008 May *FSR* the Reserve Bank saw a 'prudent' re-pricing of risk as banks passed on higher funding costs, although it was noted that there was a risk that if credit conditions tightened excessively the slowdown in economy will be exacerbated. Non-performing loans ticked up modestly over 2008.

By May 2009 a material decline in asset quality had occurred, although from a low base, and there was an expectation of a further deterioration over the course of 2009. In addition, there were increasing reports of some borrowers facing difficulties obtaining credit. The Reserve Bank reiterated the message that banks should not tighten lending criteria excessively.

In hindsight a graduated release of any capital buffers may have been optimal. There was no evidence of a credit crunch and there was no depletion of capital as the banking system remained profitable. Moreover, with the heightened level of uncertainty surrounding the global outlook and its impact on the New Zealand economy, there was also the possibility of a serious capital shortfall arising in the near term if asset quality significantly deteriorated much more than it did. Given the uncertainty, the Reserve Bank would have expected released capital to be used to support lending rather than to pay dividends in excess of profits.

4 Conclusion

This article has attempted to map the new operational framework for macro-prudential policy on to the last financial cycle. This counterfactual exercise is admittedly somewhat artificial, given the different institutional context, and the fact that we have the added benefit of hindsight

that comes with living through the most significant global downturn since the Great Depression, and the specific events that unfolded here in New Zealand.

Nevertheless, this exercise is instructive in that it provides some form of test of the new policy framework based on historical “data”. What we can say, with some degree of comfort, is that our indicator framework would have been signalling a concern with the build-up in systemic risk, particularly from 2005 onwards. At the very least the Reserve Bank would have been seriously considering macro-prudential intervention around this period. The article is a little bit more tentative on the optimal mix of tools that might have been applied. The generalised nature of the financial imbalances would seem to have merited an aggregate approach to addressing systemic risk, either in the form of an aggregate capital buffer or adjustments to the CFR. This approach could have been complemented by sectoral tools, particularly if it was felt that more traction over the cycle was necessary later in the period.

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