Financial Stability Report

November 2016

RESERVE BANK
OF NEW ZEALAND
TE PŪTEA MATUA

Reserve Bank of New Zealand
Financial Stability Report

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Contents

Chapter 1
Financial stability risk and policy assessment

New Zealand's financial system remains sound and continues to operate effectively. The banking system holds capital and liquidity buffers above regulatory requirements. Despite an increase in funding costs and a modest increase in loan loss provisioning associated with the dairy sector, the banking system remains profitable by international standards. However, there remain three key risks to future financial stability: housing market vulnerabilities; bank funding pressures; and dairy sector indebtedness.

The recent magnitude 7.8 Kaikoura earthquake is not likely to present a risk to financial stability. The main impact is likely to be on the insurance sector. Although it is too early to estimate the financial cost of the earthquake, the insurance sector as a whole appears well positioned to meet related claims.

Risk assessment

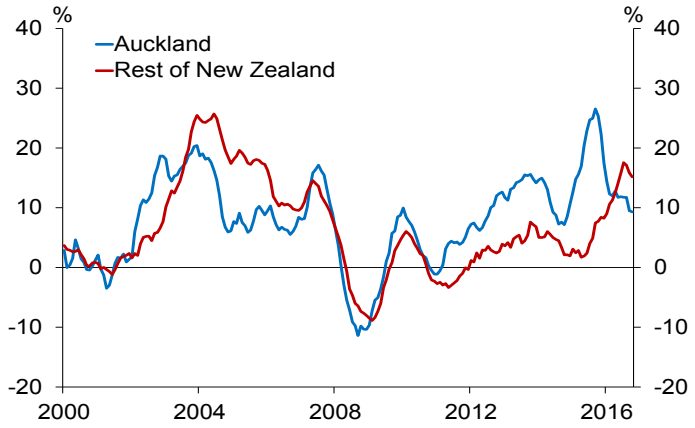
Vulnerabilities in the housing market have grown.

Vulnerabilities in the housing market have increased in the past six months. Despite some recent softening, house price growth in Auckland remains high at 9.3 percent in the year to October (figure 1.1), and Auckland's house price-to-income ratio, at 9.6, is among the highest in the world. House price pressures continue to spread to the rest of the country, with most cities experiencing annual house price growth above 10 percent. Credit to the household sector is growing rapidly, and the household debt-to-disposable income ratio now stands at 165 percent, a record high.

Rising house prices continue to reflect low interest rates, steady income growth, and an imbalance between population growth and the rate of house building. There is a risk that a reversal of any of these factors could cause a significant market correction. The Reserve Bank's loan-to-value ratio (LVR) restrictions have reduced the share of risky, high-LVR loans on bank balance sheets and improved bank resilience to

house price falls. However, resilience could be undermined if the recent increase in the share of lending at high debt-to-income (DTI) ratios is sustained. High-DTI loans are at a higher risk of default in the event of an economic downturn, so an increasing concentration of this lending is of concern.

Figure 1.1 Annual house price inflation *(3-month moving average)*

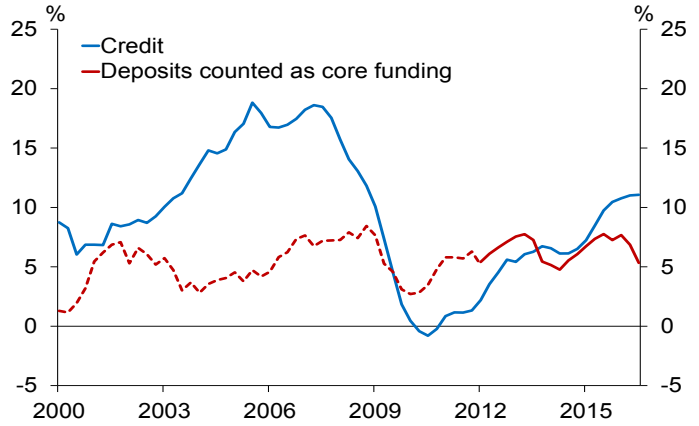


Source: CoreLogic NZ, Real Estate Institute of New Zealand, RBNZ estimates.

Bank exposure to offshore funding markets is increasing.

New Zealand's banking system relies on offshore wholesale funding markets as a result of low levels of domestic savings. In recent years, banks have reduced this dependence due to improved household saving, reflected in high rates of domestic deposit growth, and relatively subdued credit growth (figure 1.2). However, banks are now relying more on offshore funding as household deposit growth has slowed and credit growth has increased.

Figure 1.2 Annual increase in credit and deposit funding *(% of GDP)*



Source: Statistics New Zealand, RBNZ *Liquidity Survey*, RBNZ *Standard Statistical Return* (SSR).

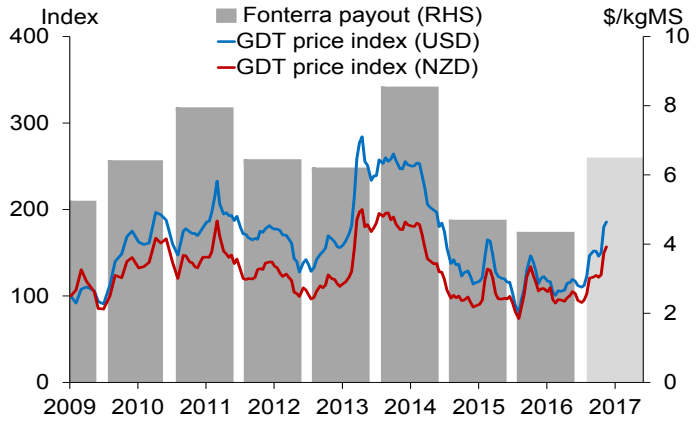
Note: 'Deposits counted as core funding' includes haircuts made as part of the liquidity policy, which increase according to the size of the deposit. The dotted line shows growth in deposits measured by the SSR, prior to the introduction of the *Liquidity Survey*.

Recently, banks appear to have tightened credit standards and competed more aggressively for deposits to close this funding gap. Nevertheless, banks are having to increase the share of funding that they obtain from offshore wholesale markets. For now, banks are able to fund in international markets relatively easily at reasonable cost. However, they will become more susceptible to the risk that global market volatility could increase funding costs and reduce access to offshore funding. Offshore funding markets could be disrupted by a number of factors, including credit rating downgrades, a disorderly unwinding of vulnerabilities in China or Europe, and geopolitical risks.

The dairy sector remains vulnerable to low commodity prices.

Low dairy prices have caused the average dairy farm to suffer operating losses for the past two seasons. However, auction prices for whole milk powder have increased by 69 percent since July this year, due in part to a reduction in European production and projected falls in New Zealand supply (figure 1.3). Fonterra recently raised its forecast farm gate milk price for the 2016-17 season to $6 per kilogram of milk solids, and this is likely to return the average dairy farm to profitability.

Figure 1.3 Fonterra payout and global whole milk powder prices *(January 2009 = 100)*



Source: Thomson Reuters, Fonterra, GlobalDairyTrade (GDT).

Note: Payout figures in the chart include dividends. The 2016-17 payout refers to Fonterra's latest forecast farm gate payout and forecast earnings per share before retentions.

Nevertheless, parts of the dairy sector remain under significant pressure. In aggregate, dairy farms have reduced costs, but there is significant variation in cost structures across farms. Even with the improvement in dairy payouts, some farms may struggle to achieve profitability – especially given that 20 percent of farms account for around 50 percent of overall dairy debt. As a result, problem loans are likely to continue to increase. Debt levels have been stretched further as dairy farms have borrowed working capital to absorb operating losses over the past two seasons. High debt levels leave the sector vulnerable to any future weakness in dairy prices.

Policy assessment

Banks should maintain capital and funding buffers...

Banks need to maintain strong capital and funding buffers to ensure they are resilient to existing and emerging risks. The Reserve Bank is currently undertaking a review of bank capital requirements. The review will assess the overall level of capital required, as well as the definition of capital and the method of setting risk weights on credit exposures.

...and ensure dairy provisions are sufficient.

Banks have increased provisioning levels for their dairy exposures over the past six months, consistent with cash flow pressures on indebted farms. In light of recent price improvements, credit losses are likely to be lower than suggested by the more severe scenarios in stress tests conducted on banks' dairy exposures last year. Nevertheless, problem loans are likely to increase further, as losses take time to materialise. Therefore, banks should ensure that provisions and other buffers are appropriate for expected losses.

LVR policies are improving bank resilience…

Stress tests suggest that banks are likely to be able to absorb losses that arise in a housing market downturn, but they would be able to do so only by significantly cutting back on lending. The ensuing credit contraction would amplify the economic downturn, by decreasing investment, consumption and house prices, and by increasing foreclosures and forced sales.

The LVR policy, that the Reserve Bank first implemented in 2013, was designed to mitigate the risk of sharp credit contraction in a housing market downturn by protecting bank balance sheets from a significant increase in credit losses. Since the policy was introduced, there has been a significant improvement in the resilience of bank balance sheets. This is most apparent in the banking system's share of mortgage lending at LVRs of over 80 percent, which has declined from 21 percent in September 2013 to 11 percent in September 2016.

However, vulnerabilities in the Auckland housing market continue to increase and spread to the rest of the country. The increasing share of mortgage lending to property investors in recent years is a concern, given evidence that investors tend to default more frequently during severe housing market downturns and tend to have high DTI ratios relative to owner-occupiers.

The Reserve Bank has responded by tightening restrictions on new lending to property investors, requiring most investors to have a deposit of at least 40 percent from October 2016. At the same time, the allowable proportion of new owner-occupier loans to borrowers with deposits of less than 20 percent was reduced. These measures are designed to further increase the resilience of banks' mortgage portfolios to a downturn in the housing market. Early evidence suggests that these new restrictions have taken some pressure out of the housing market, with new lending, housing market transactions and price growth all easing in recent months.

However, addressing the underlying imbalance between housing demand and supply will be necessary to ensure that price growth remains contained over the longer term. While a number of actions have been taken to improve supply responsiveness, the rate of house building in Auckland is still less than required to accommodate the strong population growth. There remains a real risk that pressure will once again start to build.

…but high-DTI lending is growing.

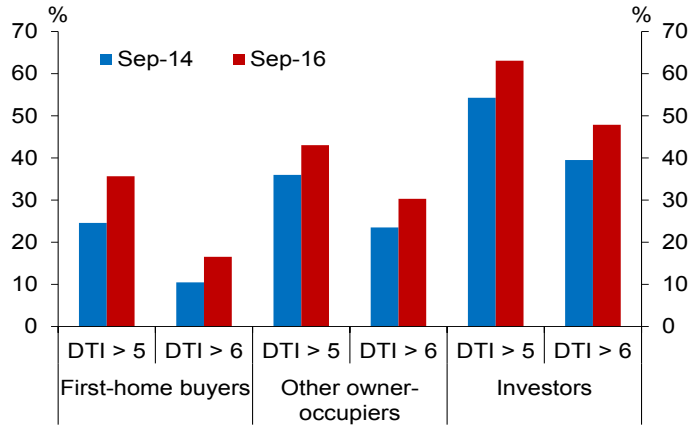
While LVR restrictions are increasing the resilience of bank balance sheets, banks have expanded their lending to customers with high DTI ratios. These borrowers would be at a higher risk of becoming strained and being forced to sell their house should (i) interest rates increase from historic lows or (ii) an economic downturn cause an increase in unemployment or a decline in household incomes. A high concentration of this lending increases the risk that a large number of forced sales could accentuate a housing market downturn and exacerbate credit losses for banks.

Currently around a third of new mortgage lending is conducted at a DTI ratio of over 6 (figure 1.4). If house prices continue to increase at the current rate, further pressure on housing affordability is likely to cause a higher share of lending at these stretched DTI ratios.

The Reserve Bank believes restrictions on high-DTI lending could be warranted if housing market imbalances and lending standards continue to deteriorate. The purpose of any restriction would be to reduce the

share of riskier, high-DTI lending on bank balance sheets, to reduce the vulnerability of the banking system and the wider economy to a significant housing market downturn.

Figure 1.4 Share of lending at high-DTI ratios



Source: Private reporting from the five largest banks.

The Reserve Bank has requested that a DTI tool be added to the *Memorandum of Understanding* on macro-prudential policy with the Minister of Finance. The Reserve Bank has also implemented an improved system for collecting DTI data on new lending and will continue to talk with banks and other stakeholders about potential policy design.

Developments in financial sector regulation

The IMF recently completed its New Zealand investigations as part of the Financial Sector Assessment Program (FSAP), intended to provide a comprehensive review of New Zealand's financial regulatory system. The IMF will publish its findings and recommendations around April next year. The Reserve Bank and other agencies will carefully consider the FSAP recommendations.

A number of other regulatory initiatives are also under way, including the bank capital review, amending the outsourcing policy for registered banks, implementing a dashboard approach to quarterly disclosure and revising the dual registration policy for small foreign banks.

Graeme Wheeler

Governor

Chapter 2
Macro-financial conditions

Global GDP growth is subdued, but is expected to improve over 2017. Monetary policy remains extremely accommodative in a number of countries, continuing to support high asset prices and debt accumulation. Financial markets remain resilient despite periods of short-term volatility around events such as the UK's vote to exit the European Union and the US presidential election. However, potential risks remain, including significant uncertainty around future government policy in the US and Europe, instability in the European banking sector, and a correction of imbalances in the Chinese economy.

Domestically, strong asset price growth in the residential and commercial property sectors has been supported by bank lending and low interest rates. Dairy prices increased significantly in recent months, but indebtedness in the agriculture sector continues to rise. The household debt-to-disposable income ratio has increased from the record high at the time of the May *Report*. New Zealand's current account deficit has fallen and low interest rates have reduced the servicing burden of New Zealand's external debt.

International conditions

Global economic activity has been weak...

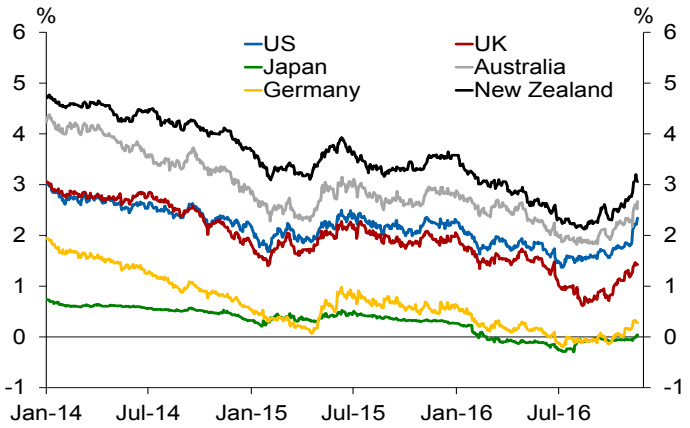
Global GDP growth is subdued and remains below trend. The IMF expects growth to be weak in 2016, due in part to weak demand and investment in advanced economies. Growth is forecast to increase slightly in 2017, driven largely by a recovery in stressed emerging market economies, such as Brazil and Russia.

...despite further easing of monetary policy.

Subdued growth has led to persistently low inflation in many economies. In response, central banks in a number of advanced economies are maintaining near-zero or negative interest rates and continue to employ unconventional monetary policies. However, some analysts are questioning whether monetary policy is reaching the limit of its effectiveness and could impede financial sector intermediation in the long term.

The US is the only major advanced economy expected to tighten monetary policy in the near future, with markets largely pricing in a rate hike in December. The potential tightening is widely anticipated, which should reduce the risk of subsequent market volatility, such as capital flows out of emerging markets. In recent months, yield curves have steepened as market participants have required compensation for higher inflation risks (figure 2.1). In addition, yields have been supported by improved global growth prospects, higher expectations for commodity prices and lower expectations of further monetary stimulus. The US presidential election results have also raised the market's expectation for expansionary fiscal policy.

Figure 2.1 10-year government bond yields

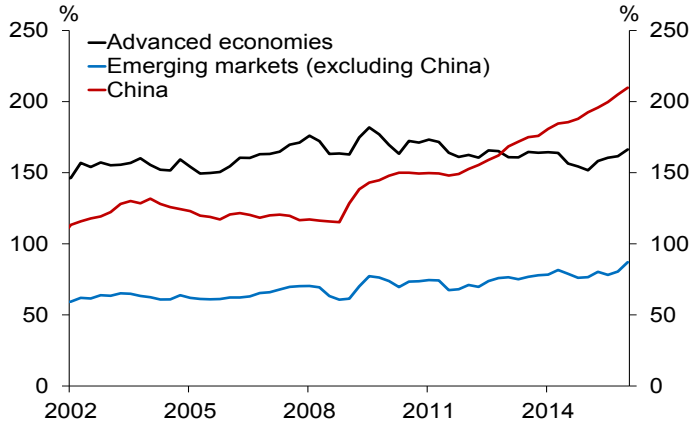


Source: Haver Analytics.

Low interest rates have allowed debt levels to rise...

Total non-financial private sector debt exceeds 141 percent of GDP in emerging market economies, and 166 percent of GDP in advanced economies (figure 2.2). The growth in emerging market debt has been sharp, particularly in China, which accounts for 74 percent of the increase in global non-financial private sector debt since the end of 2008. The rapid increase in Chinese debt, continued pressure on the renminbi from capital outflows, and high house price inflation in major city centres indicate large vulnerabilities in the Chinese economy. Chinese authorities are strictly enforcing capital controls and have allowed the renminbi to weaken to an eight-year low. A disorderly unwinding of China's imbalances could particularly affect New Zealand banks' access to offshore funding markets, given that China is the second largest market for New Zealand exports.

Figure 2.2 Global non-financial private sector debt-to-GDP

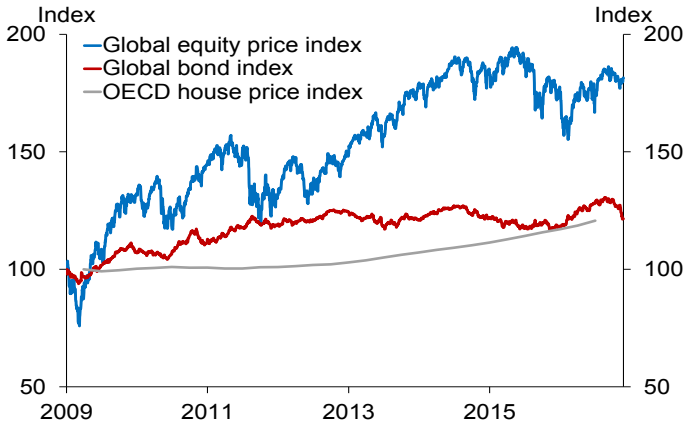


Source: Bank for International Settlements, RBNZ estimates.

...and asset prices to increase...

Low interest rates and rising indebtedness have been associated with rising asset prices (figure 2.3). Equity values grew rapidly in many countries, including New Zealand, and appear inflated on some metrics. Low policy rates and unconventional monetary policy by some central banks are supporting bond prices and compressing long-term yields. However, the recent reversal in long-term bond yields could lead to a correction in asset prices.

Figure 2.3
Global asset price indices
(January 2009 = 100)



Source: Bloomberg, OECD.

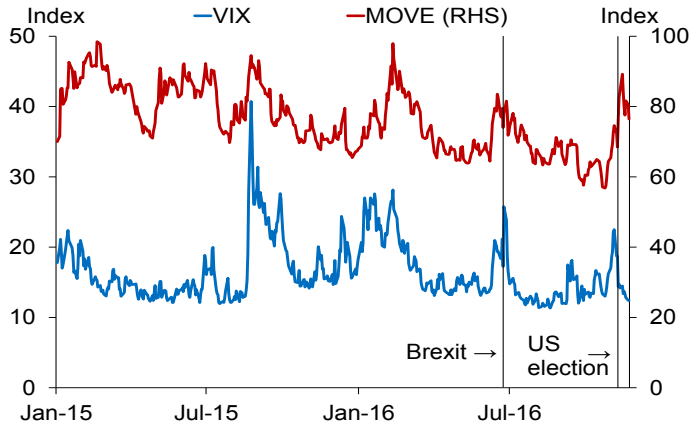
Note: Global bond index is the Bloomberg Barclays Global Aggregate Total Return index. Global equity price index is the MSCI World index (free-float weighted equity index) including both developed and emerging markets.

In aggregate, global house prices have increased since 2013. However, there is significant variation across countries. For example, prices rose 14 percent in Sweden over 2015 but fell in Greece and Italy. In addition, there is marked variation within some countries. For example, in Australia in the year to June 2016, house prices rose 8 percent in Melbourne but fell by around 6 percent in Perth.

...making financial markets susceptible to volatility.

Stretched asset values leave markets susceptible to large corrections and periods of short-term volatility. Volatility increased following the UK's vote to leave the European Union (the Brexit vote) on 23 June and the US presidential election on 8 November (figure 2.4). However, financial markets continued to function well during these periods. In the weeks following the Brexit vote and the US election, equity markets recovered and financial market volatility subsided. Nevertheless, the longer-term implications of the Brexit vote and US presidential election remain unclear.

Figure 2.4
Indicators of financial market volatility



Source: Bloomberg.

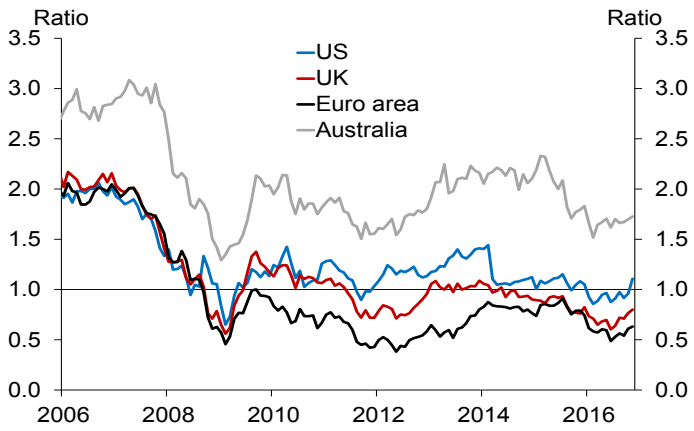
Note: MOVE is the implied volatility of US Treasury markets. VIX is the implied volatility of the S&P 500 equity index.

There are concerns about the prospects for the European banking sector...

Markets remain concerned about the prospects for the European banking sector. In the near term, some banks face potentially large fines in relation to misconduct in the years prior to the global financial crisis (GFC). The sector also faces longer-term challenges, such as high levels of stressed debt in some countries. Nearly 40 percent of loans in the banking sectors of Greece and Cyprus, and more than 14 percent of Irish, Italian, and Portuguese banking sector loans, are non-performing. The banking sector is under pressure to regain profitability in the face of regulatory reforms and flattening of yield curves due to extraordinarily loose monetary policy. These concerns continue to weigh on bank price-

to-book ratios, a market indicator of banks' expected future profitability (figure 2.5).

Figure 2.5 Price-to-book ratios for selected banking systems



Source: Bloomberg.

Note: The price-to-book ratio is market capitalisation divided by balance sheet equity.

The challenges facing the banking system reflect broader problems in European economies, which are experiencing low GDP growth and excessive sovereign debt. Uncertainty around the future impact of the UK's Brexit vote is also affecting the region. Given the size of European economies and banks, and their connectedness with the rest of the world, a severe escalation of problems in Europe could have repercussions for the cost and availability of offshore funding for New Zealand banks.

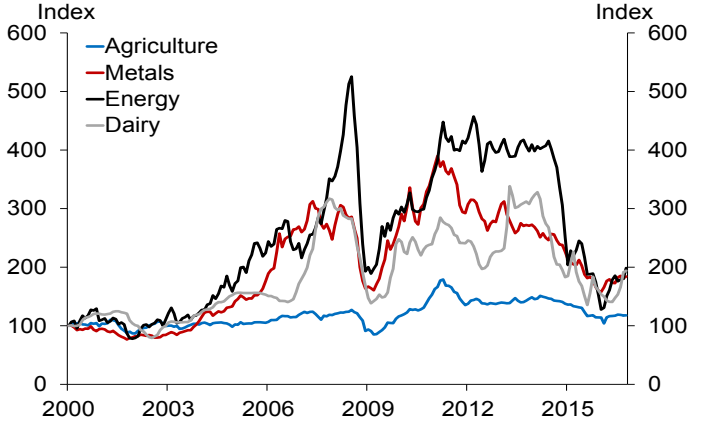
...and the rating outlook for the Australian banking system has been downgraded.

Since the May *Report*, the credit rating outlook for Australian banks has been downgraded to negative by Moody's and Standard & Poor's (S&P). Moody's commented on the potential for a deterioration in the banks' operating environment due to high house price inflation and household debt levels, and low commodity prices. S&P expressed concern about the Australian Government's commitment to fiscal consolidation and the potential for a reduction in government support for the banking system. The outlook for the Australian banking system is relevant for New Zealand as the four largest New Zealand banks are Australian owned and their credit rating is linked to their respective parents' ratings.

Commodity prices have begun to recover.

Low global growth has been a key driver of weakness across most commodity markets (figure 2.6). Prices have recovered somewhat in recent months, but the sustainability of these gains is uncertain. Oil prices remain constrained by large inventories and the high price elasticity of supply from US shale oil producers. Of particular importance for New Zealand, whole milk powder prices have increased by 69 percent since July, although the outlook for prices remains uncertain.

Figure 2.6 Commodity prices *(USD indices, January 2000 = 100)*



Source: ANZ, IMF.

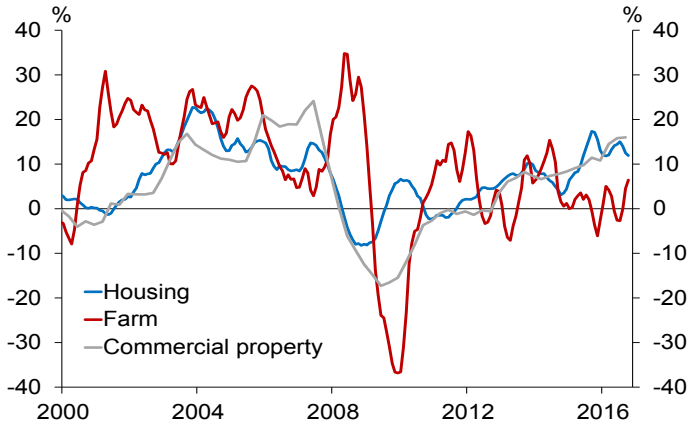
Domestic conditions

Low interest rates continue to support asset prices.

New Zealand's economy is strong relative to other advanced economies, growing 2.8 percent in the year to June 2016. Headline inflation remains low and monetary policy stimulative, with the Reserve Bank having cut the OCR by 50 basis points, to 1.75 percent, since May.

Low interest rates have helped to support price growth in the main asset classes (figure 2.7). New Zealand house price inflation remains elevated, at 11.9 percent in the year to October. House price inflation fell slightly in Auckland but has increased throughout the rest of New Zealand. Farm price inflation has been more subdued, reflecting weak dairy prices in recent seasons. Commercial property price inflation continues to increase.

Figure 2.7 Annual price growth by asset class *(3-month moving average)*

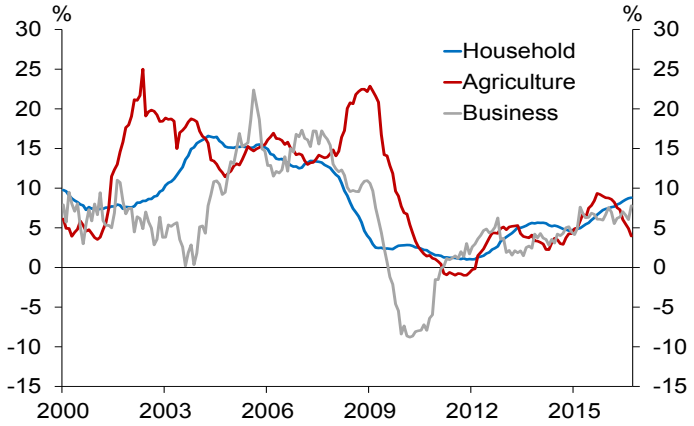


Source: Jones Lang LaSalle, Real Estate Institute of New Zealand.

Rising asset prices are contributing to strong credit growth…

Credit grew by 7.8 percent in the year to September, with credit rising across the household, agriculture and business sectors (figure 2.8). Household credit has been the dominant driver of aggregate credit growth, growing at 8.8 percent over the same period, its highest rate since 2008.

Figure 2.8 Annual credit growth by sector

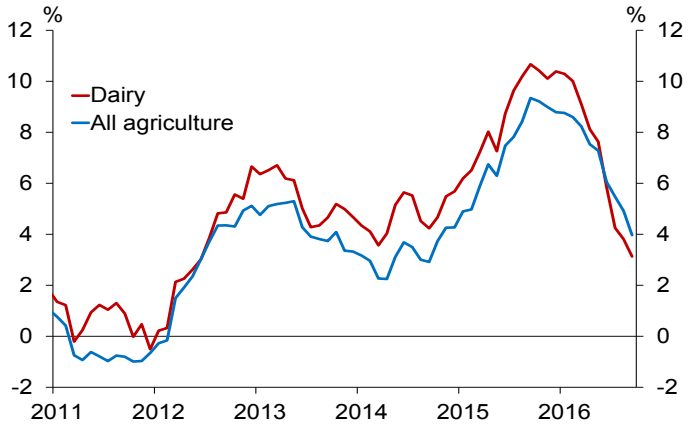


Source: RBNZ *Standard Statistical Return* (SSR).

Housing-related credit growth has been particularly strong, in part due to high house price inflation. Increasing house prices (i) require prospective homebuyers to borrow more to purchase a given house with their existing savings, and (ii) allow existing homeowners to borrow more against their homes. In contrast, consumer credit growth has continued to ease. Consumer credit grew at 3.1 percent over the year to September, compared to 9.2 percent for housing-related credit.

Business credit has grown at 7.8 percent in the year to September, the fastest rate since the GFC. Agriculture credit growth has fallen materially, to 4 percent, from the 8.6 percent growth seen in the year to February. This drop off has largely been driven by falling dairy credit growth (figure 2.9). Banks report that farms' demand for loans to finance expansion and capital investment has fallen, but demand for working capital loans remains strong.

Figure 2.9
Annual credit growth to agriculture sector



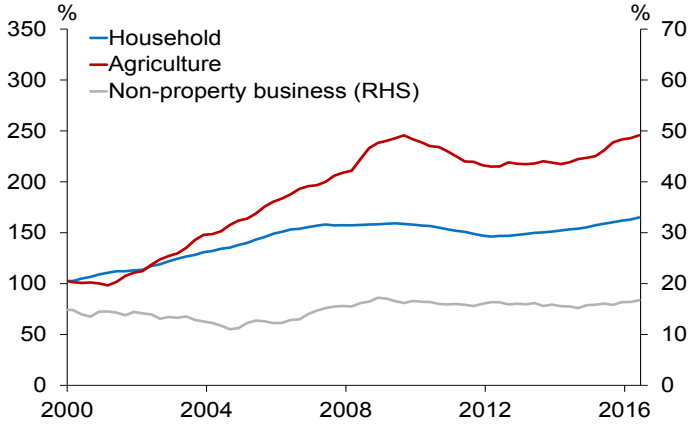
Source: RBNZ SSR, private reporting.

Note: The dairy series only covers lending by banks.

...increasing sectoral indebtedness.

Indebtedness in the household and agriculture sectors has increased since the May *Report* (figure 2.10). Debt levels in the non-property business sector remain low. Household debt-to-disposable income increased to 165 percent in June, and debt has also grown as a proportion of income in the agriculture sector, largely driven by increased dairy sector debt. However, debt servicing burdens in the household and agriculture sectors have been dampened by falling interest rates.

Figure 2.10
Debt by sector
(% of income)



Source: Statistics New Zealand, RBNZ SSR, RBNZ estimates.

Note: For the agriculture and non-property business sectors, debt is derived from sectoral credit measures and income is estimated using various data series, including national accounts. For the household sector, debt and disposable income are taken from the RBNZ's published household statistics.

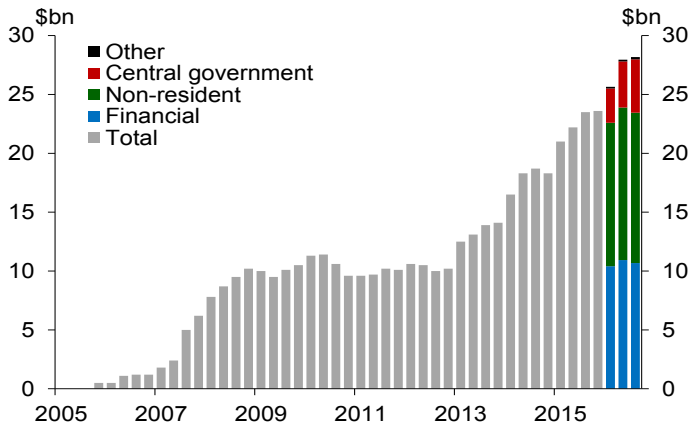
Domestic bond markets are expanding...

New Zealand's domestic bond markets have continued to expand over the past year. Growth is being driven by the increasing volume of central government bonds on issue and greater issuance of Kauri bonds, which are NZD-denominated bonds issued onshore by non-residents. Outstanding domestic financial sector debt has remained broadly unchanged over the past year, despite high debt issuance by banks in mid-2016. Debt issuance by the non-financial sector continues to increase, albeit at a modest rate.

NZD-denominated debt issued by non-residents has increased steadily since 2013. The increase in Kauri bonds on issue has been particularly notable, with the amount outstanding increasing by around 20 percent over the past year (figure 2.11). Holdings of Kauri bonds have broadly increased across all of the main participants. Offshore NZD debt

issuance by non-residents (Eurokiwi and Uridashi bonds) has been broadly flat over the same period.

Figure 2.11 Holders of Kauri bonds



Source: RBNZ *Debt Securities Database*.

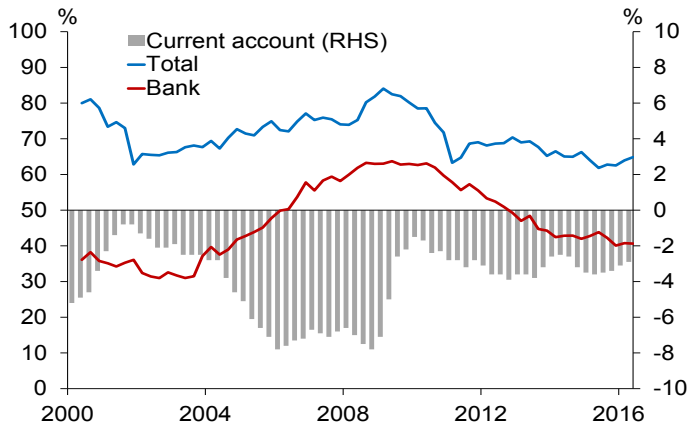
Note: Recent data are sourced from an RBNZ survey of New Zealand registries, nominee companies and registered banks, allowing for a breakdown by holder.

Issuers of Kauri, Eurokiwi, and Uridashi bonds play an important role in New Zealand's financial system. They typically use cross-currency basis swaps to hedge their foreign currency risk, providing natural counterparties for New Zealand banks wanting to hedge their foreign currency funding.

...and New Zealand's external debt position has improved.

New Zealand's annual current account deficit fell to 2.9 percent of GDP in June, down from 3.4 percent six months earlier (figure 2.12). The current account deficit is well below the level seen prior to the GFC, which was associated with a build-up in external liabilities, particularly in the banking sector. New Zealand's net external liabilities are high by international standards, but are well below pre-GFC levels.

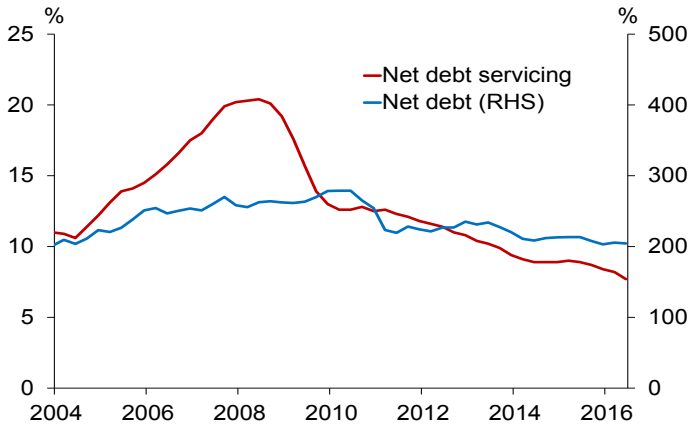
Figure 2.12 Net external liabilities and current account *(% of nominal GDP)*



Source: Statistics New Zealand.

New Zealand's external debt servicing payments as a proportion of total exports of goods and services has fallen in recent years (figure 2.13). Similarly, the ratio of New Zealand's net external debt to goods and services exports has also declined. Both debt reduction and falling interest rates have played a part in reducing the overall debt burden.

Figure 2.13 External net debt and net debt servicing *(% of goods and services exports)*



Source: Statistics New Zealand.

Chapter 3
Risks to New Zealand's financial system

New Zealand's financial system remains sound but faces three key risks: housing market vulnerabilities, bank funding pressures and dairy sector indebtedness.

House price inflation has increased across New Zealand and underlying demand drivers remain strong. Household debt levels have also risen, leaving households more vulnerable to income or interest rate shocks. The Reserve Bank's LVR policy has reduced banks' exposure to high-LVR borrowers, but a relatively high proportion of new mortgage lending is to investors and borrowers with high DTI ratios.

In recent months, New Zealand banks' reliance on offshore funding has been increasing due to a widening between household deposit growth and credit growth. Greater reliance on offshore market funding may increase banks' exposure to funding rollover risk and to global market volatility.

Conditions for the dairy sector have improved since the May *Report*. Global milk prices have risen significantly as international production fell, and most dairy farms are forecast to return to positive cash flow this season. But the outlook for prices is uncertain and the most indebted farms are still likely to face losses. Non-performing loans to the sector have increased and banks continue to increase their provisioning.

The financial system is sound but faces a number of risks.

New Zealand's financial system is sound and banks are complying with current capital, liquidity and core funding requirements. But the financial system should monitor and protect itself against three key risks: housing market vulnerabilities, bank funding pressures and dairy sector indebtedness. These risks are discussed in isolation but could crystallise together, which would tend to amplify the impact of each risk. In addition, vulnerabilities in the commercial property sector, although unlikely to threaten financial system soundness on their own, could weaken the financial system's resilience to the three key risks.

Key risks to New Zealand's financial system

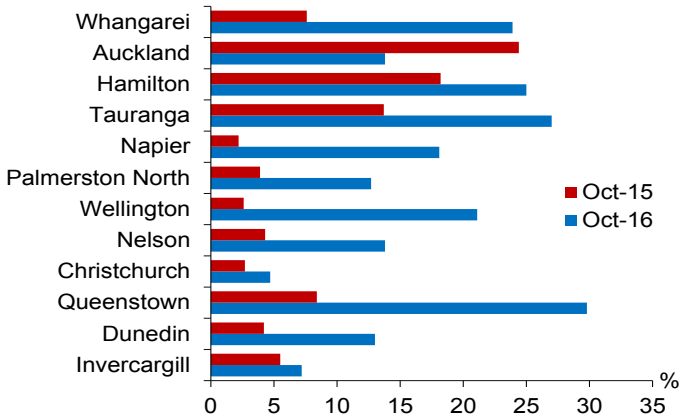
Housing market vulnerabilities

A healthy household sector is important to the soundness of New Zealand's financial system for two reasons. First, mortgages are the largest asset class on the banking system's balance sheet, so direct losses on mortgage lending can erode bank capital. Second, difficulties in the household sector can spill over to other sectors, which can cause further losses to the financial system. In particular, problems in the housing market can reduce consumption and GDP growth, as a large proportion of household wealth is held in houses.

House price inflation has increased outside of Auckland...

House price inflation has remained broadly flat, but elevated, since the May *Report*, at 11.9 percent in the year to October. Annual price growth has fallen to 9.3 percent in Auckland but price growth has generally broadened across New Zealand. Some areas in the North Island and Queenstown are experiencing extremely high rates of house price inflation (figure 3.1).

Figure 3.1 Annual house price inflation in urban areas



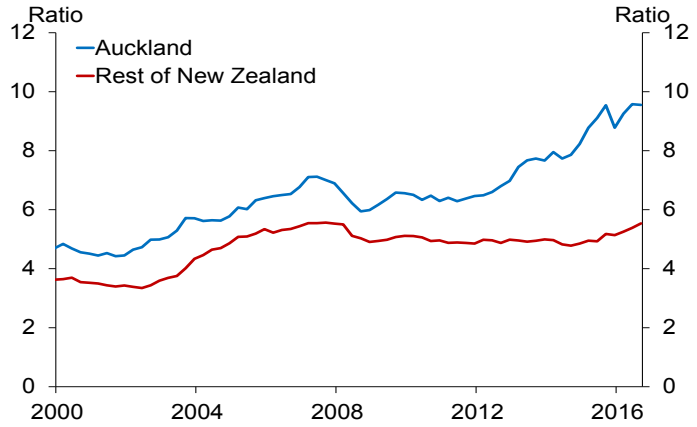
Source: CoreLogic NZ.

Note: CoreLogic NZ's house price inflation index is calculated on a different basis to the Real Estate Institute of New Zealand (REINZ) index, meaning that their reported inflation rates differ.

Auckland house prices are significantly overvalued compared to incomes, with Auckland's price-to-income ratio exceeding nine. While many other regions have seen rapidly rising house prices, prices have grown from a lower base and generally have not yet reached the same levels of overvaluation as in Auckland. Nevertheless, price-to-income ratios are rising throughout much of New Zealand, and further strong house price inflation would see prices continue to stretch relative to incomes (figure 3.2).

The risk of a sharp house price correction outside of Auckland is increasing as prices are becoming more stretched, particularly in urban areas near Auckland. The Reserve Bank tightened the loan-to-value ratio (LVR) policy in October 2016, in part due to the broadening of housing market risk across the rest of the country.

Figure 3.2 House price-to-income ratios



Source: CoreLogic NZ, REINZ, Statistics New Zealand, RBNZ estimates.

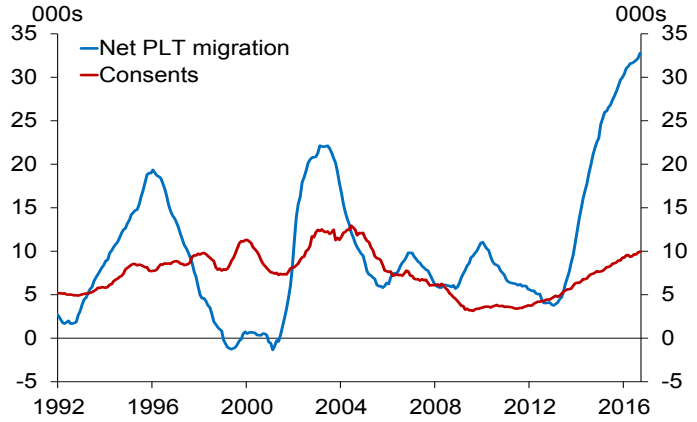
Note: Price-to-income ratios are based on estimates of averages of house prices and household income.

...and demand continues to outstrip supply.

Although the composition of house price inflation has shifted, strong underlying demand is driving high price growth in Auckland and across New Zealand. Strong net immigration, limited housing construction and low interest rates continue to support house prices. In the year to September, net international immigration to the Auckland region increased to over 32,000 (figure 3.3). Inflows have also been high in other parts of New Zealand, but to a lesser degree.

Building activity has been slow to meet increased demand for houses, particularly in Auckland. Historically, the responsiveness of housing supply has varied across New Zealand, depending on geographic, regulatory and other constraints. The ratio of the change in population to the issuance of new building consents over a period provides a simple indicator of supply responsiveness (figure 3.4). Supply in some cities outside Auckland has been fairly responsive to population growth in recent years, which should help constrain house price growth. However, it increases the risk that eventual oversupply could exacerbate a house price correction, particularly if high supply is coupled with a reversal in other fundamental drivers, such as migration.

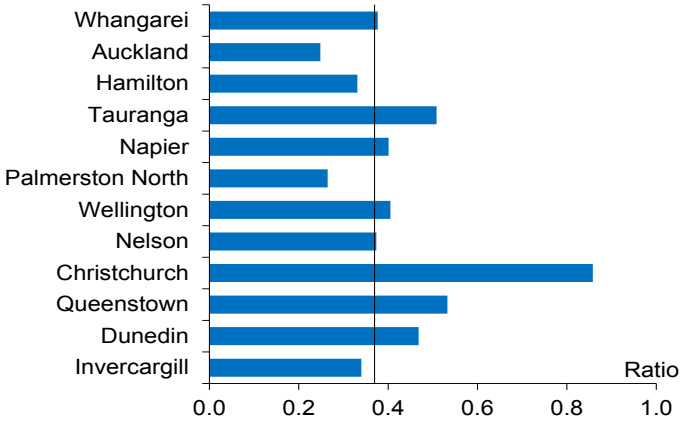
Figure 3.3 Annual Auckland migration and residential building consent issuance



Source: Statistics New Zealand.

Note: 'PLT migration' is permanent and long-term migration.

Figure 3.4 Supply responsiveness across urban areas *(ratio of consent issuance to population growth)*



Source: Statistics New Zealand.

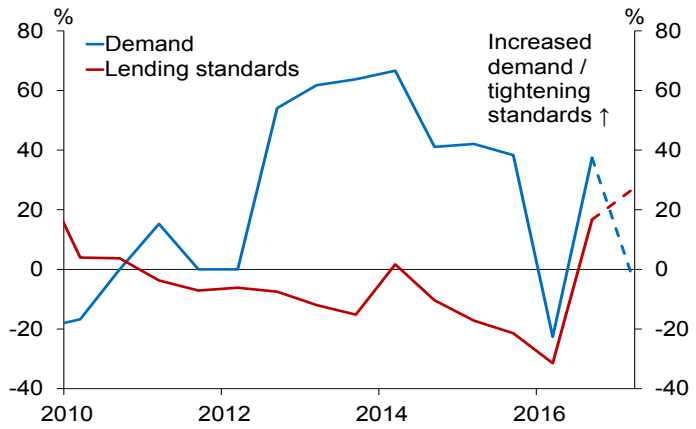
Note: Population growth covers June 2013 to June 2015 and consents cover January 2013 to December 2015. The line represents the nationwide average number of residential dwellings per person.

Increased supply could reduce housing market pressures in Auckland.

An increase in the supply of new housing would help to alleviate current imbalances in the housing market, particularly in Auckland. The outlook for supply in Auckland has improved since the May *Report*, with the proposed Auckland Unitary Plan looking to ease land use restrictions and free up land for the construction of new dwellings. The proposed changes are estimated to provide capacity for construction of over 400,000 dwellings, although the plan is subject to appeal and could change. In addition, a number of government reforms should help increase supply, including the Special Housing Areas, the Crown Land Housing Programme and the Housing Infrastructure Fund.

The extent to which the proposed Auckland Unitary Plan accelerates housing supply in Auckland remains subject to the final form of the plan and its interaction with other supply constraints, such as infrastructure and developer financing. The Christchurch rebuild continues to place demand on construction resources and property developers are reporting increased difficulty obtaining finance. Some banks report continued strong demand for credit from property developers but banks have limited appetite to increase their property development sector exposure. Overall, banks expect lending standards (particularly loan pricing) to tighten further over the next six months (figure 3.5).

Figure 3.5 Property development loan demand and commercial property lending standards *(net percentage of respondents)*



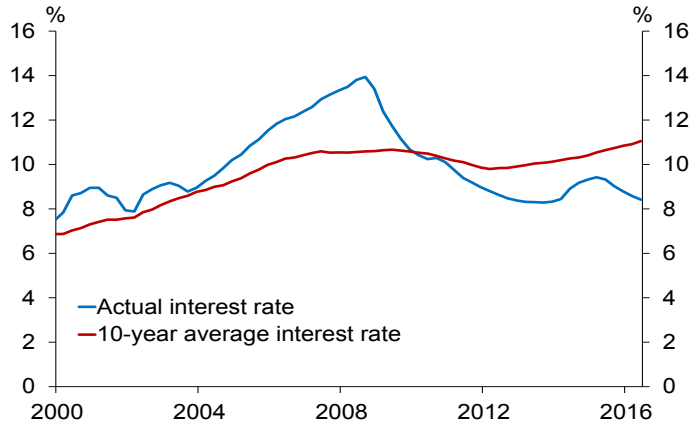
Source: RBNZ *Credit Conditions Survey*.

Note: This chart shows the percentage of respondents reporting an increase in demand (a tightening in lending standards) minus the percentage reporting a decline (loosening). Individual bank responses are weighted by market share. The dotted line is the expected change six months ahead.

Household debt is growing…

Household credit growth remains strong, at 8.8 percent in the year to September, and has increased since the May *Report*. Consequently, the household debt-to-disposable income ratio increased to 165 percent in June, above its pre-global financial crisis (GFC) peak. Low interest rates have reduced the current debt servicing burden (figure 3.6), but high debt levels leave some households exposed to future income and interest rate shocks. International evidence from past housing market downturns shows that highly indebted households are more likely to (i) default on debt and (ii) reduce consumption by more during downturns, leading to spillovers to other sectors and amplified bank losses during a housing market downturn.

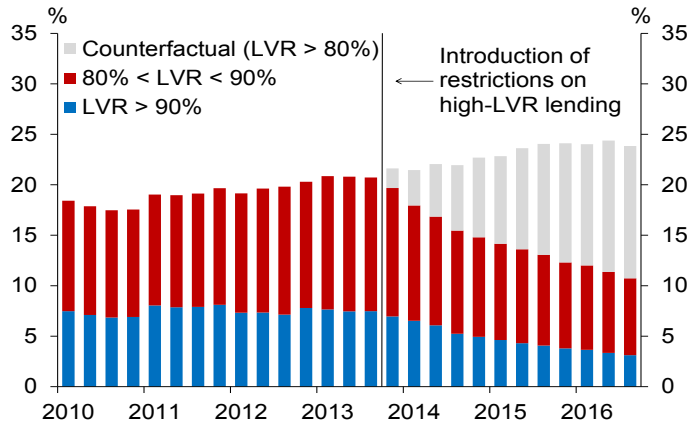
Figure 3.6 Interest servicing-to-disposable income ratio



Source: RBNZ *Standard Statistical Return* (SSR), RBNZ.

Note: Assumes all debt is subject to the same interest rate in a given period. The actual rate is the effective mortgage rate. The 10-year average interest rate is 6.7 percent.

Figure 3.7 High-LVR share of banks' residential mortgage portfolios



Source: Registered banks' *Disclosure Statements*, RBNZ *Lending Position Survey*, RBNZ estimates.

Note: Only New Zealand's five largest mortgage lenders are included. The grey bar shows the estimated additional share of high-LVR lending had LVR restrictions not been implemented.

...but banks' balance sheets are improving.

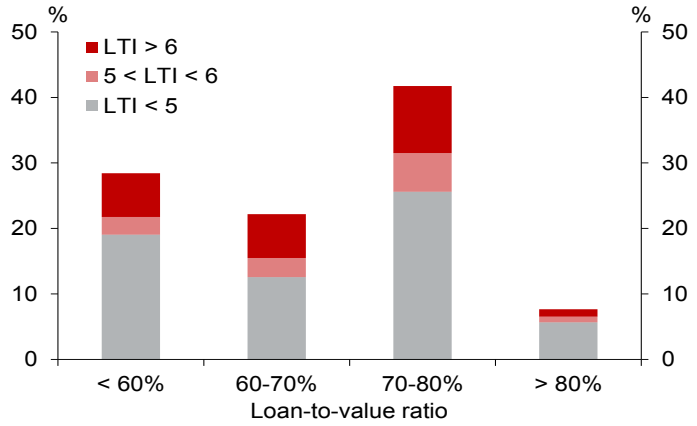
While vulnerabilities related to the housing market and household indebtedness have increased, the resilience of banks' mortgage portfolios has improved. The share of banks' mortgage lending portfolios with LVRs greater than 80 percent has decreased markedly since late-2013, from 21 percent to 11 percent in September 2016. This followed the introduction by the Reserve Bank of restrictions on high-LVR lending. Reserve Bank modelling suggests that the share of loans with LVRs of greater than 80 percent would have increased to 24 percent by September 2016, had banks continued to grant new high-LVR loans at the previous rate. These estimates suggest there would have been an additional $29 billion of high-LVR loans on bank balance sheets without the LVR restrictions (figure 3.7).

Growth in high-DTI lending is concerning...

Although the LVR profile of banks' portfolios has improved, banks appear to be providing a material amount of new lending at debt-to-income (DTI) ratios of over 5. For example, between May 2014 and September 2016 about 39 percent of banks' new lending with LVRs between 70 and 80 percent had a loan-to-income (LTI) ratio in excess of 5 (figure 3.8).[1] Lending at relatively high LVR and DTI ratios is particularly concerning because (i) borrowers with higher DTI ratios are more susceptible to income or interest rate shocks and (ii) high-LVR borrowers are less able to sell their house to pay off their debt, should they suffer an income or interest rate shock during a period of falling house prices.

1 Data limitations mean that an LVR by DTI breakdown is not available. LTI generally only includes a borrower's mortgage debt to the bank that originated the loan. DTI includes all of a borrower's debt, including debt to other lenders.

Figure 3.8
New mortgage commitments by LVR and LTI ratio
(% of new mortgage commitments)



Source: Private reporting from the five largest banks.

Note: Data cover new commitments between May 2014 and September 2016.

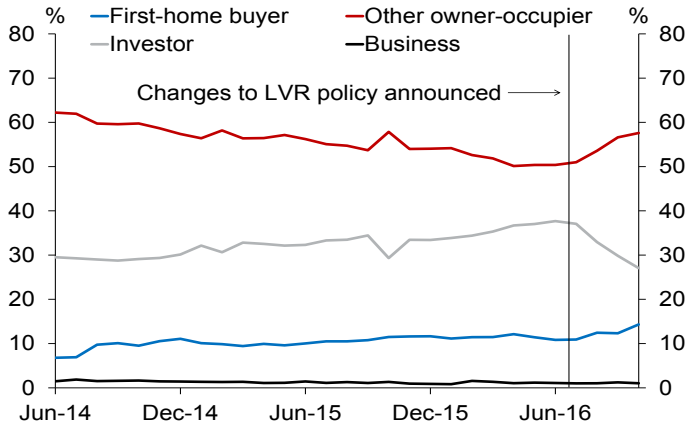
The availability of loans to borrowers with DTI ratios greater than 5 has increased substantially since the GFC, as high house price inflation has reduced housing affordability and low interest rates have increased the debt capacity of borrowers. The share of lending at DTI ratios over 5 has increased for all buyer types since 2014 (figure 1.4). For example, the mean DTI ratio for a first-home buyer in the top half of the distribution has increased from 5.2 to 5.7, and has increased from 7.5 to 8 for investors.

While the majority of lending at a DTI ratio greater than 5 is to higher income households, who may have more income left over after servicing debt, higher income households also tend to have higher fixed expenditure that may be difficult to reduce in a downturn. In addition, a sharp reduction in expenditure by these households could exacerbate a downturn, and banks' origination processes are unlikely to account for these broader spill-over risks.

...as is the trend in investor lending.

Another concerning trend is the share of new mortgage lending obtained by investors. In the year to June, property investors' share of new residential mortgage commitments increased from 32 percent to 38 percent (figure 3.9). International evidence shows that lending to investors typically carries higher risk than lending to owner-occupiers, partly because investors have a greater incentive to default strategically in severe downturns.[2] In light of this risk, in October 2016, the Reserve Bank tightened restrictions on banks' high-LVR lending to residential property investors. The flow of new mortgage commitments to investors has fallen since the restrictions were announced.

Figure 3.9
New mortgage commitments by purpose
(% of new mortgage commitments)



Source: RBNZ *New Residential Mortgage Committments Survey.*

Investors also account for a disproportionate share of lending at DTI ratios over 5. Investors may be able to support higher DTI ratios than owner-occupiers, as they generally have larger gross incomes and benefit from tax deductions that are not available to many owner-

2 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/consultations/regulatory-impact-assessment-2016-lvr-changes.pdf?la=en

occupiers. At the same time, investors are vulnerable to a period of lost tenant income during a housing downturn.

Bank funding pressures

Robust funding profiles enhance the soundness of banks.

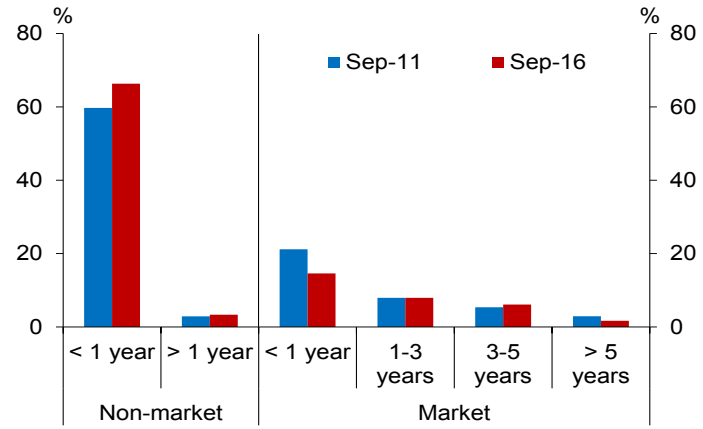
For a sound and efficient financial system, banks must maintain a funding and liquidity profile that is robust to shocks. Banks are vulnerable to liquidity risk due to the maturity transformation role they play in the financial system, typically by providing long-term loans, such as mortgages, that are financed by shorter-term funding, such as retail deposits. The GFC demonstrated the risk of an over-reliance on short-term market funding. To mitigate this risk, the Reserve Bank implemented a liquidity policy for banks in 2010. Banks are complying with the policy (see chapter 4) but appear to be finding it more difficult to maintain their current funding profiles.

The stability of bank funding has improved since 2010...

The overall funding profile of New Zealand banks has improved since the GFC. This is in part due to the introduction of the core funding ratio (CFR) requirement, which is designed to improve banks' resilience to funding market disruptions. It encourages the use of stable funding sources such as household deposit funding and long-term market funding.

Currently, 70 percent of the banking system's total non-equity funding is raised through non-market funding, mostly retail transactional deposits and short-term retail term deposits (figure 3.10). Banks' reliance on short-term retail deposit funding is not considered a financial stability concern, as these funds (particularly lower value deposit accounts) tend to be stable. The remaining 30 percent of funding is from wholesale funding markets, with half funded at terms greater than one year. Around 60 percent of market funding is raised offshore, almost entirely in foreign currency that is hedged to mitigate foreign exchange risk.

Figure 3.10 Non-equity bank funding by source and maturity *(locally incorporated banks)*



Source: RBNZ *Liquidity Survey*.

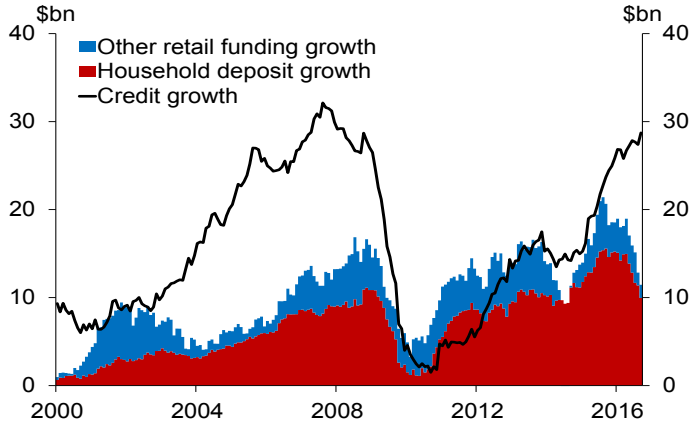
...but more recently deposit growth has weakened.

Banks were able to improve their funding profiles in recent years when household deposit growth was strong relative to credit growth (figure 3.11). Since late-2015, credit growth has continued to increase, but household deposit growth has slowed, possibly due to falling deposit interest rates and increasing household consumption.

The growth in total non-market funding remains strong, at 7.8 percent in the year to September, but an increasing amount of this growth appears to be from less stable corporate and institutional deposits. This funding is

subject to haircuts under the CFR requirement, so growth in non-market funding that qualifies for the CFR has been weaker than growth in total non-market funding. As a result, banks have had to issue more market funding to maintain their CFRs (figure 3.12). Although banks' funding profiles are currently robust, if the gap between credit and household deposit growth continues to widen, banks may become more reliant on market funding, increasing their exposure to global liquidity shocks.

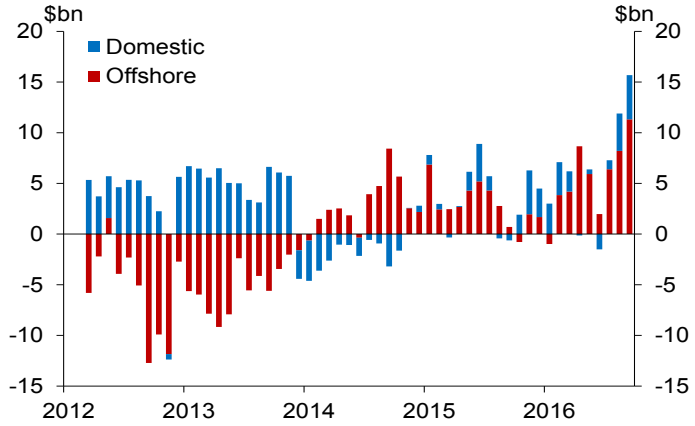
Figure 3.11 Annual bank credit and retail funding growth



Source: RBNZ SSR.

Note: 'Other retail funding' is derived by subtracting household funding from total NZD retail funding.

Figure 3.12 Annual change in market funding



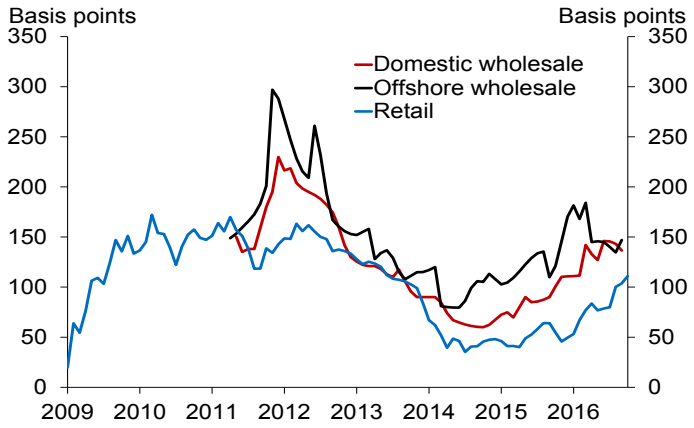
Source: RBNZ *Liquidity Survey*.

Banks are attempting to reduce the gap between credit and deposit growth…

Banks have begun to increase lending and deposit rates in an attempt to reduce the gap between credit and household deposit growth. Retail deposit funding spreads continue to increase from post-GFC lows, in line with market funding spreads (figure 3.13), but the degree to which higher deposit rates will increase the aggregate level of deposits in the banking system is uncertain.

The increase in funding costs has been passed through to higher lending rates. This tightening in credit conditions may dampen credit growth, narrowing the gap between deposit and credit growth. However, higher

Figure 3.13 Bank funding costs *(spread to swap rates)*



Source: RBNZ *Liquidity Survey*, RBNZ SSR.

Note: Wholesale spreads are a simple average of the landed cost of new issues at terms of between four and seven years by the big four banks. The retail spreads are proxied using the spread between the average six-month deposit rate and the 180-day bank bill.

lending rates could exacerbate risks in the housing and dairy sectors. For example, it could increase the debt servicing costs of existing homeowners and dairy farms. It could also cause a sharp reduction in lending to the property development or dairy sectors, areas where banks are already reporting tightening lending standards.

...but are likely to increase reliance on offshore funding...

If the divergence between credit and household deposit growth persists, banks will need to increase market funding. That would add to the already significant volumes of market funding that banks are expected to rollover in the medium term. Banks will need to replace about $40 billion of market funding that will no longer count towards the CFR within the next three years (figure 3.14). In addition, recent regulation changes by the Australian Prudential Regulation Authority will indirectly require New Zealand subsidiaries to reduce their reliance on funding from their Australian parent.[3]

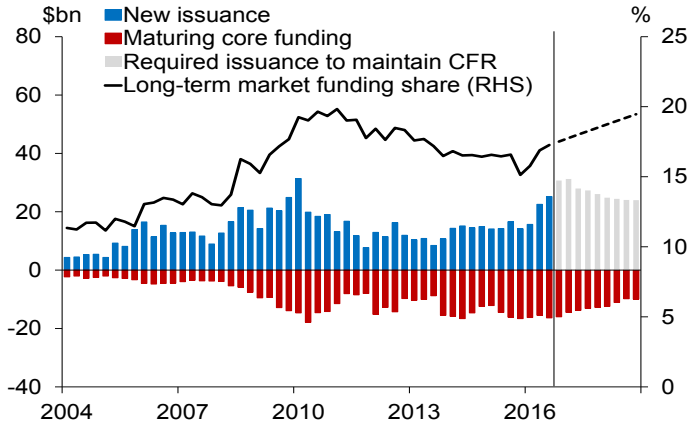
...which would increase rollover risk.

Given the small size of domestic funding markets relative to the volume of funding required, a significant proportion of the required funding would be raised offshore. While CFR requirements will mean that most of this funding would be raised at longer terms, greater offshore funding increases rollover risks as banks will be required to raise funds more regularly, and in greater volumes, from offshore wholesale markets.

The availability and cost of raising funds in offshore markets for New Zealand banks varies depending on domestic and international macro-financial conditions. For example, a material increase in banks' use of market funding could threaten credit rating downgrades, as credit rating agencies view the reliance on offshore funding as a key weakness of the major New Zealand banks.

In addition, a number of potentially large international vulnerabilities could disrupt global funding markets, including: a sharp unwinding of vulnerabilities in China; further stress in European banks and economies; a rise in protectionism in global politics; and possible spillover effects on emerging market economies if US interest rates rise (see chapter 2). Some of these shocks could disproportionately affect New Zealand banks. For example, investors could worry about the impact of a crisis in China on the solvency of New Zealand banks, given China is the second largest market for New Zealand exports and a sharp reduction in New Zealand export demand would harm the domestic economy.

Figure 3.14 Annual issuance and expiry of core funding *(12-month rolling total)*



Source: Bloomberg, RBNZ *Liquidity Survey*, RBNZ SSR, RBNZ estimates.

Note: The dashed line refers to the long-term market funding share of lending consistent with issuance of market funding at the level required to maintain the current CFR. It assumes that banks' Tier 1 capital grows in line with loans and advances, and bank credit and deposits continue to grow at their current rates. See chart datapack for further details.

3 Australian Prudential Regulation Authority's APS222 limits the parent banks' exposure to all related entities relative to the capital of the parent.

Dairy sector indebtedness

Banking sector exposures to the dairy sector have increased.

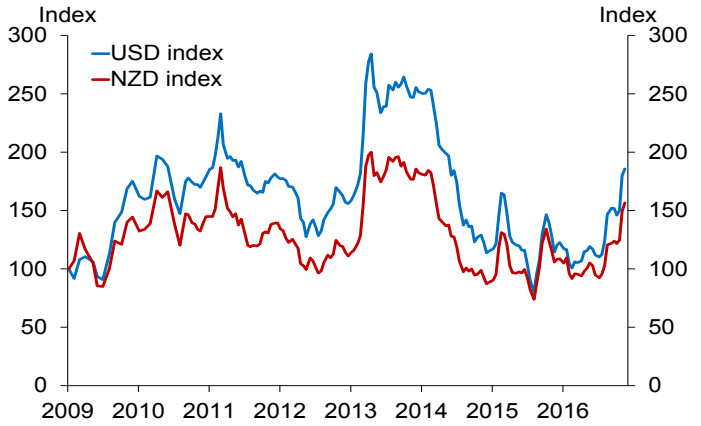
The financial condition of New Zealand's dairy sector has deteriorated in recent years as low dairy prices have seen the average dairy farm face negative cash flows for two consecutive seasons. As farms have increased their bank borrowings for working capital needs, the banking system's exposure to the sector has risen. Dairy lending now accounts for more than 10 percent of the banking system's gross lending.

Recent dairy price rises have improved the outlook for dairy farms…

There are signs that financial conditions for dairy farms have begun to improve. Dairy prices have recovered significantly since the May *Report*, with prices for whole milk powder (New Zealand's main dairy product) increasing by 69 percent between July and November (figure 3.15). Fonterra has increased its forecast payout for the 2016-17 season to $6 per kilogram of milk solids (kgMS) before dividends, $1.75 per kgMS higher than its opening forecast in May.

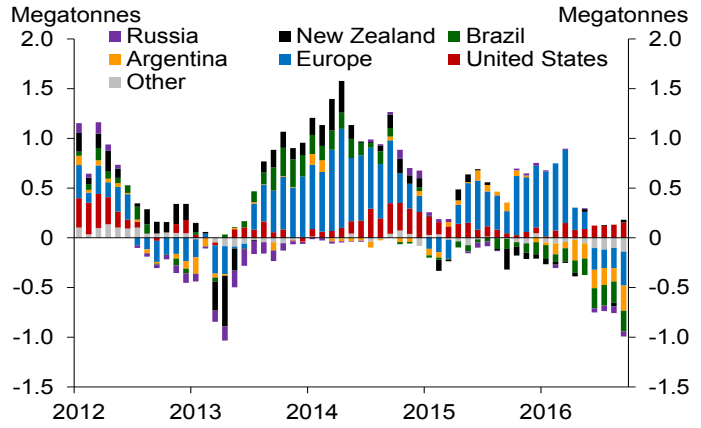
The recovery in global dairy prices appears to have been mainly supported by falling global production. Many key dairy-producing countries have decreased output in recent months in response to lower prices (figure 3.16). New Zealand production fell materially in the 2015-16 season and is expected to fall further in the 2016-17 season.

Figure 3.15 Global whole milk powder prices *(January 2009 = 100)*



Source: GlobalDairyTrade, Thomson Reuters.

Figure 3.16 Global dairy production *(annual growth)*



Source: CLAL, Dairy Australia, Dairy Companies Association of New Zealand (DCANZ), EuroStat, United States Department of Agriculture.

Notes: July-September figures for Brazil are estimated based on June figures.

...but the future path of prices is uncertain.

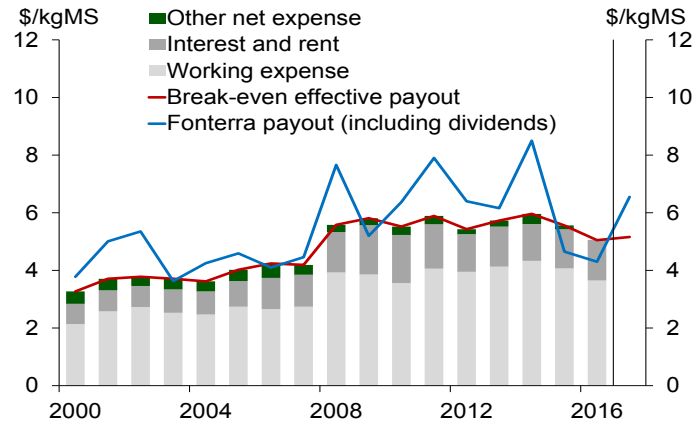
The recent fall in global production has been positive for dairy prices but the outlook for prices is mixed. Future European production will depend on the impact of the European Union's official support for dairy farms, which has increased significantly since the May *Report*. Some aspects of these increased interventions may help dampen production, for example payments to farms that reduce production. Intervention to date has led Europe to accumulate large stockpiles of skim milk powder. The eventual release of those stocks, and continued growth in US production, may weigh on dairy prices.

The outlook for demand is less clear. Early 2016 provided some signs of renewed demand, with China's annual imports of whole milk powder in the nine months to September 2016 increasing by 20 percent, compared to the same period in 2015. A large proportion of that increase was in early 2016. However, there is considerable uncertainty about Chinese dairy inventory levels and their impact on future demand. In addition, Russia's ban on importing dairy products from Europe and the US has been extended to the end of 2017, which is likely to weigh against a recovery in international demand.

Farms have, on average, managed to reduce costs...

Dairy farms have managed to reduce costs in response to low prices. The average farm is estimated to have reduced costs by around 90 cents per kgMS between the 2013-14 and 2015-16 seasons (figure 3.17). Farms have cut back on the use of supplementary feed, fertiliser, veterinary services and farm maintenance. In addition, indebted farms have benefited from lower interest rates.

Figure 3.17 Actual and break-even effective payout



Source: DairyNZ, RBNZ estimates.

Note: The effective payout is based on Fonterra's farm gate milk price and dividend payments, and takes account of deferred payments and levies. 2016-17 season numbers are forecasts.

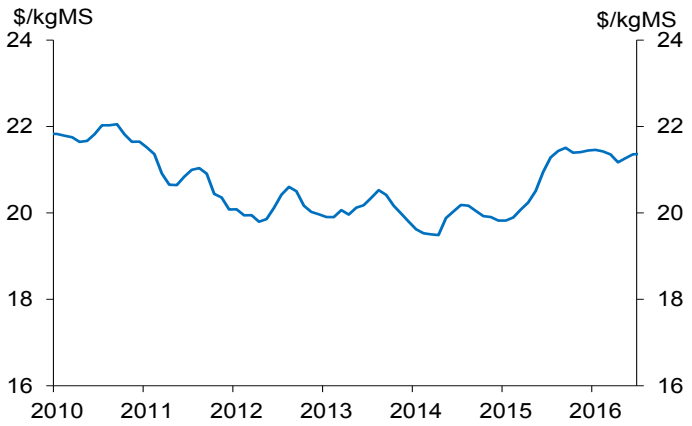
Some cost reductions, such as lowering the use of supplementary feed, may be sustainable as they reflect farms' changing business models. But others, such as cutting back on veterinary services and maintenance expenditure, may not be sustainable in the long run without harming production capacity. The recovery in dairy prices may see some of these cost reductions reversed, if farms respond by increasing spending. Hence we expect the average farm's costs to increase in the 2016-17 season, but remain below Fonterra's current forecast payout of $6.50-6.60 per kgMS, including earnings before retentions.

...but some still operate at a loss and have accumulated debt...

While the average farm is expected to have positive cash flow this season, some still face losses and have accumulated debt. Dairy sector bank debt increased from $20.10 to $21.50 per kgMS produced between September 2014 and September 2016 (figure 3.18). It is likely that the

most indebted farms account for a disproportionate share of this increase as they typically have higher costs and, therefore, have had larger borrowing requirements to meet working capital needs. These farms are of particular concern from a financial soundness perspective, as they are most vulnerable to low dairy prices and are the farms to which banks are most exposed.

Figure 3.18 Dairy debt relative to production



Source: DCANZ, private reporting.

Note: Production is three-year moving average annual production.

...and would face further pressure if prices fall.

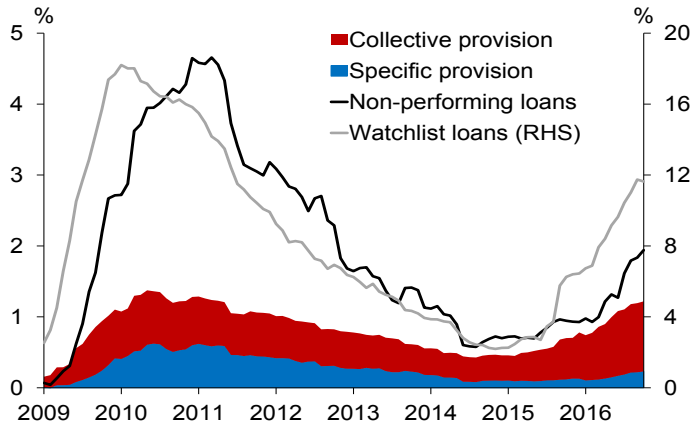
Although dairy credit growth has slowed recently, banks report that demand for working capital facilities increased over the past six months, and expect this to continue over the next six months. Should the recovery in prices be sustained, we could see reduced demand for working capital in the 2016-17 season.

The Reserve Bank and the main dairy lenders have previously modelled the impact of continued low dairy prices on farm viability and on bank losses in a number of stress test scenarios.[4] Although based on data from previous seasons when farm costs were higher, they show that a significant proportion of farms would struggle to service their debt in a severe low-price scenario and banks would face material losses on dairy lending (up to 10 percent of the initial value of banks' dairy loan portfolios).

Banks' dairy non-performing loans and provisions have increased.

Banks' non-performing and watchlist dairy loans have increased as a proportion of total dairy lending since the May *Report*. The non-performing loan ratio increased to 1.9 percent in October and the watchlist loan ratio increased to 11.6 percent (figure 3.19). Banks

Figure 3.19 Dairy asset quality *(% of sectoral lending)*



Source: Private reporting.

Note: Non-performing loans include impaired and 90-days past due loans. The watchlist loans percentage is an internal bank metric which provides a leading indicator of non-performing loans, but is not consistently defined across banks.

4 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2015/2015dec78-8.pdf and http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2016/2016mar79-5.pdf

continue to increase their provisioning, with total dairy provisions as a proportion of all dairy loans approaching its 2010 peak.

Non-performing loans appear low given the severity of the downturn and also compared to the loss estimates from the Reserve Bank's dairy stress tests. This may, in part, be due to farms achieving greater than expected cost reductions and continued lending by banks. A higher watchlist ratio suggests that non-performing loans may increase in coming months, as the non-performing loans ratio tends to lag the watchlist loans ratio.

Banks have supported farms through the dairy downturn, and we have not seen widespread stressed sales or foreclosures of dairy farms. As banks have increased their 2016-17 season dairy payout forecast in the past six months, they are likely to continue supporting farms that they consider to be viable in the medium-term. However, lower farm prices could affect banks' willingness to lend to some farms.

Farm prices fell in early 2016, but seasonally low farm sales through the middle of the year have made it difficult to track the evolution of farm values since the May *Report*. We may see dairy farm prices increase if the dairy price recovery is sustained, but prices are likely to remain subdued compared to the levels seen in late 2014.

Additional risks to New Zealand's financial system

Commercial property

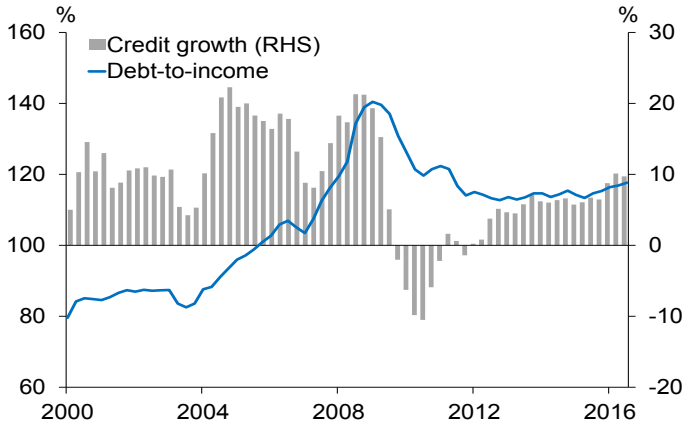
A commercial property downturn could weaken the financial system...

Historically, the commercial property market has been highly cyclical in New Zealand and other advanced economies. A sharp fall in prices could cause significant losses for investors and developers. Lending to the sector accounts for around 8 percent of total bank lending and underwriting standards have been conservative following the GFC. A downturn in the commercial property market in isolation is unlikely to threaten financial system soundness, but it could weaken the financial system's resilience to the key risks described in this chapter.

...as banks continue to increase lending to the sector.

Bank credit to the commercial property sector grew around 10 percent in the year to September (figure 3.20). However, the sustained credit growth in recent years does not appear to have materially worsened the financial position of the sector, as measured by the DTI ratio. Indebtedness in the sector appears contained when compared to the pre-GFC period. In part, this is likely due to solid income growth in recent years.

Figure 3.20 Commercial property DTI ratio and annual credit growth



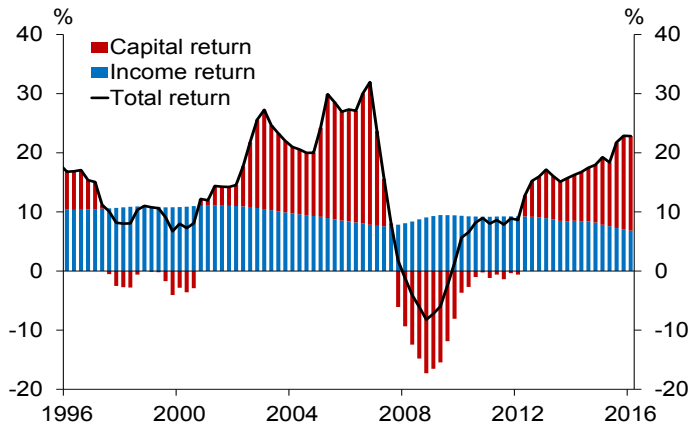
Source: Statistics New Zealand, RBNZ SSR, RBNZ estimates.

Note: Income is estimated using various data series, including national accounts. Credit growth is a three-month moving average.

Recently, capital gains in commercial property have been strong...

Total returns in the commercial property sector have been high in recent years and were 23 percent in the year to September 2016. But since mid-2015, the growth has come primarily from capital gains (figure 3.21). High price growth cannot persist in the long run and there is a danger that investors and developers could face losses if their investment decisions are based on unrealistic expectations for capital gains.

Figure 3.21 Annual returns on New Zealand commercial property investment



Source: Jones Lang LaSalle (JLL).

...which have driven yields to historic lows.

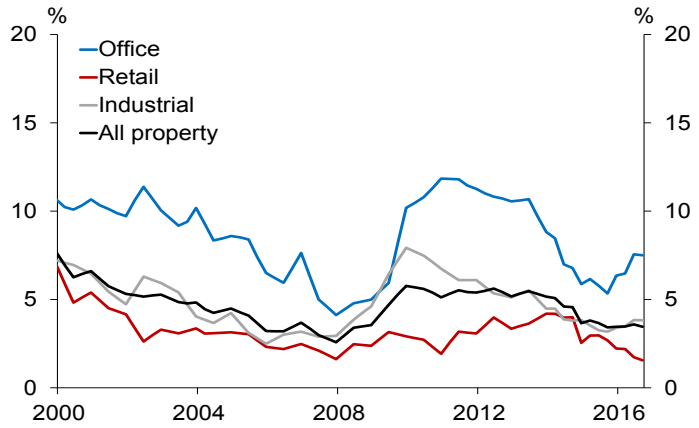
High commercial property prices have in part been driven by low interest rates in New Zealand and other advanced economies. Yields in all sub-sectors are at or near historic lows, with an average yield of 7.2 percent in September 2016, a fall of 0.9 percentage points in just two years. Yields in the prime office and prime industrial sectors are below 7 percent. Despite low yields, commercial property remains attractive to investors as the low interest rate environment has lowered returns from other investments, including commercial property in other advanced economies, where rental yields tend to be lower than in New Zealand.

Vacancy rates are low but increasing in some sectors...

Recent commercial property price inflation has also been supported by fundamentals, with nationwide vacancy rates near pre-GFC lows (figure 3.22). Demand for retail space remains high, particularly in Auckland where rents are high and vacancy rates low. But nationwide vacancy

rates have recently increased in the office and industrial sectors. The increase was most marked in Christchurch, where 13 percent of office space was vacant in September 2016, an increase of 4 percentage points in 12 months, and industrial vacancy rates were 6 percent. A broad rise in vacancy rates would depress returns on commercial property and could cause a sharp reversal in prices.

Figure 3.22 Commercial property vacancy rates

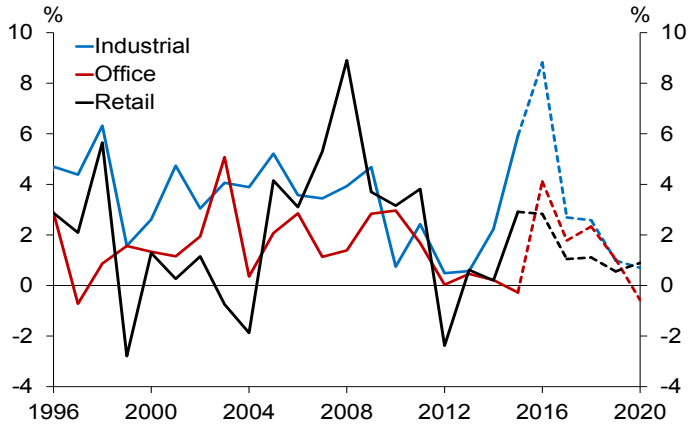


Source: JLL.

...and could be exacerbated by forthcoming supply.

Pressure on vacancy rates could increase as new property developments are completed. More than 1.5 million square metres of commercial property space is forecast to be completed in 2016, with the majority being industrial buildings, where supply is expected to increase more than 8 percent (figure 3.23). The addition to retail and office stocks is more muted, but office supply is forecast to increase by around a third in Christchurch as the rebuild continues. There is a risk that the increase in supply and rising vacancy rates could dampen commercial property prices, particularly in Christchurch and in the office sector.

Figure 3.23 Annual supply of additional commercial property, by sector *(% of existing stock)*



Source: JLL.

Note: The dashed lines are forecasts of future supply.

Box A

The potential role of a macro-prudential debt-to-income policy

Borrowers with elevated DTI ratios are vulnerable to a period of reduced income or higher interest rates and can present a risk to the banking system and wider economy. This box discusses the possible role that a limit on high-DTI loans or a similar serviceability restriction could play in mitigating these risks, and how it would complement other macro-prudential tools.

The potential role of DTI policies

The Reserve Bank focuses its regulation on areas where financial institutions' incentives differ significantly from the public interest.[5] A macro-prudential DTI policy would enable the Reserve Bank to limit the degree to which banks can reduce mortgage lending standards during periods of rising housing market risks, in order to protect financial system soundness. This may be desirable in some periods as (i) banks are not incentivised to adequately take account of the impact their lending can have on the overall financial system and (ii) the economy can suffer if too many borrowers take on more debt than they are able to service.

DTI policies can support financial stability by reducing the scale of mortgage defaults during a severe economic downturn. All else equal, borrowers with higher DTI ratios have less disposable income to draw on as a buffer to avoid defaulting on their mortgage, without selling their home, in a period of lost income or higher mortgage rates. Loan serviceability is a crucial determinant of probability of default, reflecting that many borrowers will attempt to service loans even if they are in a position of negative equity. For example, the rise in mortgage defaults after the GFC in Ireland and the US were strongly linked to borrowers' ability to pay – including regional unemployment, loan-to-income ratios and interest rate structure.[6]

Even if high-DTI loans do not directly result in losses to the banking system, they could indirectly impact the soundness and efficiency of the financial system. Forced house sales by high-DTI borrowers would likely amplify house price declines, impair the ability of banks to resolve distressed loans, and increase loss given default for banks. High-DTI households are also likely to reduce consumption more sharply during a severe downturn, in an attempt to continue servicing loans and increase precautionary savings. A number of studies have found that sharp falls in consumption by indebted households reinforced the economic impact of the GFC. There is also evidence that highly indebted households in New Zealand cut back on consumption more sharply than other households.[7]

DTI policies can complement other macro-prudential policies, including LVR policies. DTI policies can increase the resilience of households to income shocks, reducing the number of forced house sales in a downturn, and LVR policies can increase the equity buffers of households, reducing the losses faced by banks if borrowers come under stress. Using both policies at the same time is likely to achieve a more targeted response to rising housing market risks, given that both LVR and DTI ratios are important drivers of the scale of mortgage losses during a

5 Fiennes, T (2016), 'New Zealand's evolving approach to prudential supervision', speech delivered to the NZ Bankers' Association in Auckland, http://www.rbnz.govt.nz/research-and-publications/speeches/2016/speech2016-09-01

6 For example, see Kelly, R and T O'Malley, 'A Transitions-Based Model of default for Irish Mortgages,' Research Technical Paper 17RT14, Central Bank of Ireland 2014; and Gerardi K, K Herkenhoff, L Ohanian & P Willen (2015) 'Can't Pay or Won't Pay? Unemployment, Negative Equity, and Strategic Default', NBER Working Papers 21630.

7 See Thornley, M, (2016) 'Financial stability risks from housing market cycles' for more discussion of the relationship between consumption and indebtedness, http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2016/2016jul79-12.pdf See Bascand, G, (2016),'Changing dynamics in household behaviour' for more discussion of the New Zealand evidence, http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Speeches/2016/Changing-dynamics-in-household-behaviour.pdf

severe downturn. Tightening policy along only one of these dimensions would likely entail larger efficiency costs to achieve a given reduction in the downturn loss rate.

An important feature of a DTI policy is that the borrowing capacity of constrained borrowers grows in line with their incomes. In contrast, sharp rises in house prices unlock borrowing capacity for existing property owners under an LVR policy, especially for borrowers with a large portfolio of property. This suggests that a DTI policy could have a more enduring impact in leaning against rising debt levels (and potentially house prices) throughout a house price boom, thereby increasing the effectiveness of macro-prudential policy in dampening the extremes of a credit cycle.

International use of DTI policies

Serviceability standards are a particular area of focus for supervisors at present, reflecting concerns that the current extremely low level of mortgage rates could lead households to take on excessive debt. Limits on DTI ratios or loan serviceability are becoming increasingly common in countries with rising house prices (table A1). At least 10 advanced economies apply a limit on high-DTI lending, including the UK, Ireland and Norway.[8] Other countries, including Australia, have introduced guidelines for banks on mortgage origination standards (such as how to account for the risk of higher mortgage rates over the term of a mortgage).

Table A1
Selected interventions related to mortgage serviceability

	Country	Limit	Coverage
Debt-to-income limits	Ireland	No more than 20% of lending above 3.5	Owner-occupiers only
	United Kingdom	No more than 15% of lending above 4.5	Owner-occupiers only
Other examples: Norway, Singapore.			
Debt service ratio limits	Canada	Maximum of around 40% to qualify for government insurance	All mortgage lending that can qualify for government insurance
	Hong Kong	Limit of 50% for owner-occupiers and 40% for investors	Bank mortgage lending
Other examples: US, South Korea, Israel, Lithuania, Estonia.			
Prudential guidelines	Australia	Minimum standards for origination tests (e.g., assumed interest rate, living expenses)	Bank mortgage lending
Other examples: Switzerland, Germany, UK.			

8 See 'International experience of limits on LTV, LTI and DTI ratios', box in: https://www.imf.org/external/pubs/ft/scr/2016/cr16316.pdf

Chapter 4

Soundness and efficiency of New Zealand's financial system

New Zealand's financial system remains sound and has functioned well over the past six months. The banking system continues to have sufficient buffers of capital, liquid assets and stable funding relative to current regulatory requirements. Bank funding costs have increased since the May *Report* but profitability remains sound. Lending has grown strongly although banks report a tightening in credit conditions, which they expect to continue over the next six months. From an international perspective, New Zealand's banking system appears to be operating efficiently.

New Zealand's insurance sector continues to be shaped by global developments, including low interest rates and a strong supply of capital. In the past year, the insurance sector paid dividends of about twice its net profit, narrowing solvency margins. It is too early to estimate the impact of the recent magnitude 7.8 Kaikoura earthquake on insurers, but the sector as a whole appears well placed to meet earthquake-related claims.

Since the May *Report*, there have been no significant outages in payment and settlement systems and the most important systems have operated at near 100 percent availability.

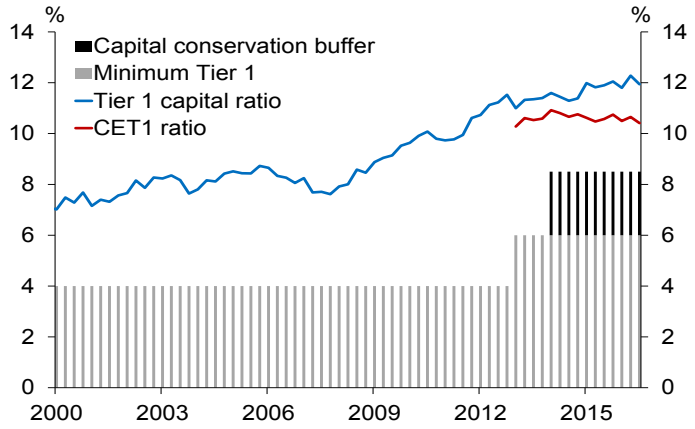
Banking sector

Banks remain well capitalised…

Overall, locally incorporated banks remain well capitalised relative to current regulatory requirements and pre-global financial crisis (GFC) levels. The system-wide Common Equity Tier 1 (CET1) capital ratio was 10.4 percent of risk-weighted assets (RWAs) at end-September 2016 and the Tier 1 capital ratio was 11.9 percent (figure 4.1).

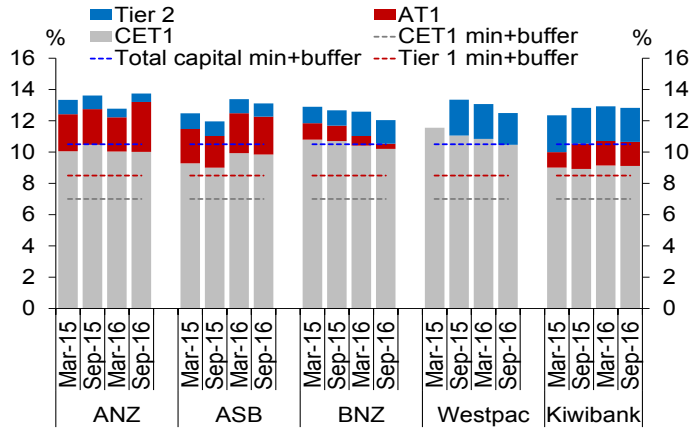
Locally incorporated banks are required to operate with a minimum CET1 ratio of 4.5 percent, a minimum Tier 1 ratio of 6 percent and a total capital ratio of 8 percent at all times. They are expected to have an additional 2.5 percent of common equity to absorb unexpected losses during periods of stress (the 'capital conservation buffer'). All locally incorporated banks are currently meeting these requirements. Major banks have broadly maintained their buffers over the capital requirements, with ANZ and ASB increasing their Tier 1 capital ratios over the past year despite large increases in their RWAs (figure 4.2).

Figure 4.1
Aggregate capital ratios of locally incorporated banks
(% of RWAs)



Source: Registered banks' *Disclosure Statements*, RBNZ *Capital Adequacy Survey*.

Figure 4.2
Capital ratios of large banks
(% of RWAs)



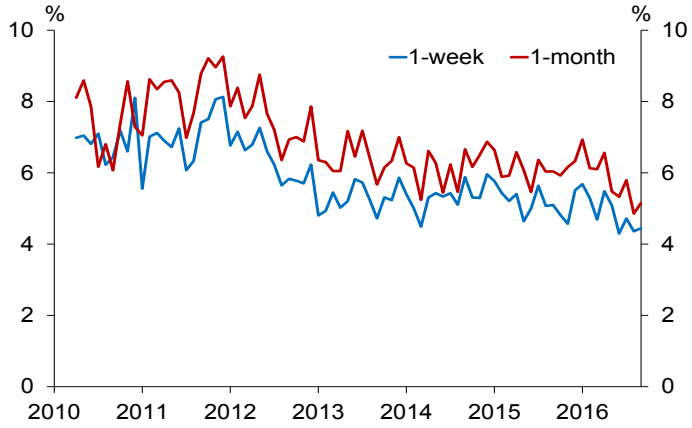
Source: Registered banks' *Disclosure Statements*, RBNZ *Capital Adequacy Survey*.

Note: 'Buffer' refers to the 2.5 percent capital conservation buffer.

...have sound liquid asset buffers...

The banking system also has sufficient reserves of liquid assets to meet regulatory requirements designed to ensure that banks are resilient to a temporary loss of access to funding. The Reserve Bank introduced mismatch ratio requirements in 2010, which require locally incorporated banks to hold sufficient liquid assets to at least match their projected cash outflows during a one-week and a one-month period of stress. Since 2013, banks have maintained a fairly stable buffer of liquid assets (figure 4.3).

Figure 4.3
Banking system mismatch ratios



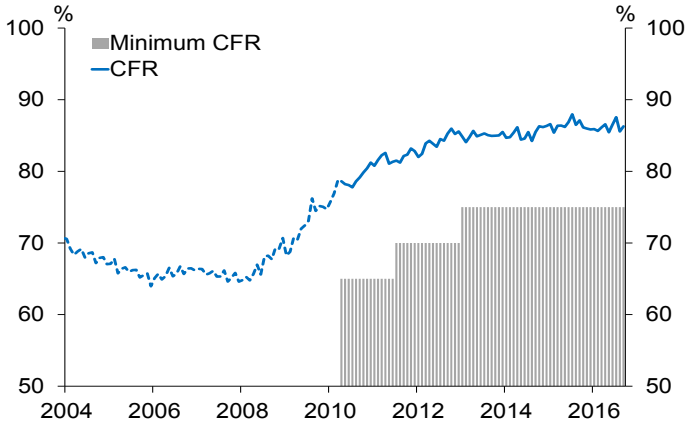
Source: RBNZ *Liquidity Survey*.

...and sufficient levels of core funding.

To limit banks' exposure to disruptions in short-term funding markets, a feature of the GFC, the Reserve Bank requires banks to finance themselves largely through stable funding sources ('core funding'). Banks must ensure that the ratio of their core funding to lending, the core funding ratio (CFR), does not fall below 75 percent and, in practice,

banks maintain a buffer above this minimum requirement. In September, the aggregate banking system CFR was 86 percent, unchanged from the time of the May *Report* and well above pre-GFC levels (figure 4.4).

Figure 4.4 Banking system core funding *(% of loans and advances)*



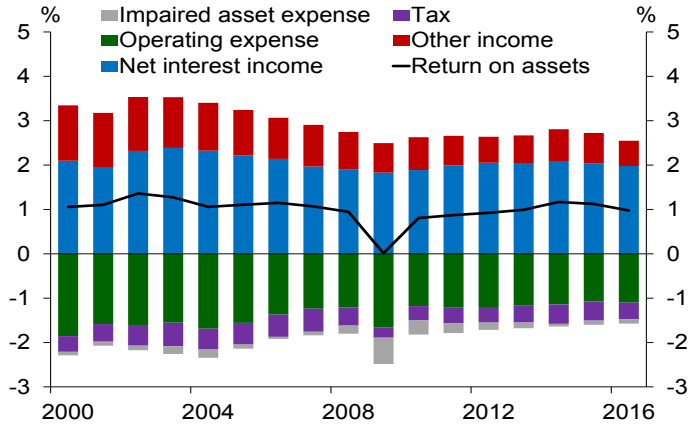
Source: RBNZ *Liquidity Survey*, RBNZ *Standard Statistical Return* (SSR).

Note: The dotted line for the CFR is an approximation based on SSR data.

Banks remain highly profitable.

Although funding costs have increased, New Zealand banks have remained profitable relative to other advanced economy banking systems. Despite strong growth in total assets, banks have continued to obtain a return on assets above 1 percent (figure 4.5). The profitability is built on low operating costs and strong net interest margins, which remain around 2.2 percent. To date, higher funding costs have had a relatively muted impact on bank profitability but bank profits could fall if they are unable to pass on higher costs, as over 75 percent of bank income derives from net interest income.

Figure 4.5 New Zealand bank profitability *(% of total assets, September years)*

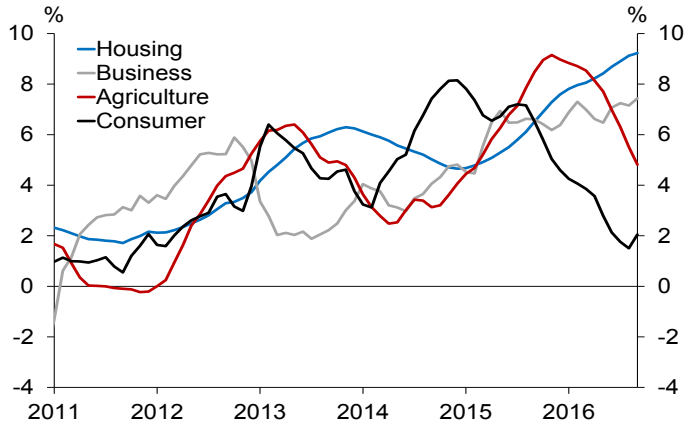


Source: Registered banks' *Disclosure Statements*, RBNZ *Income Statement Survey*.

Aggregate bank lending growth is high but varies across sectors…

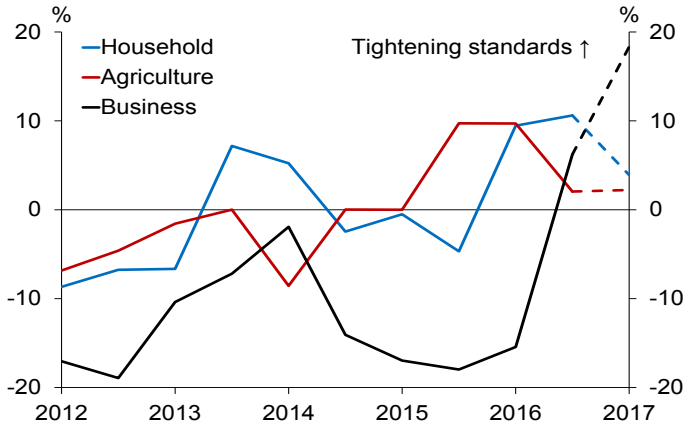
Aggregate bank lending grew 8 percent in the year to September but the composition of that growth varied across sectors (figure 4.6). Housing credit grew quickly, at 9 percent, up significantly on growth rates in late-2014. Bank credit to the business sector was also strong: lending to the property business sector grew around 10 percent, whereas credit to non-property businesses grew around 5 percent. Conversely, there has been a marked decline in the growth rate of consumer and agriculture lending.

Figure 4.6 Annual growth in bank lending by sector *(3-month moving average)*



Source: RBNZ SSR.

Figure 4.7 Change in bank lending standards *(net percentage of respondents)*



Source: RBNZ *Credit Conditions Survey.*

Note: The chart shows the percentage of respondents reporting a tightening of lending standards minus the percentage reporting an easing. Individual bank responses are weighted by market share. The dotted line is the expected change six months ahead.

...and credit conditions are expected to tighten.

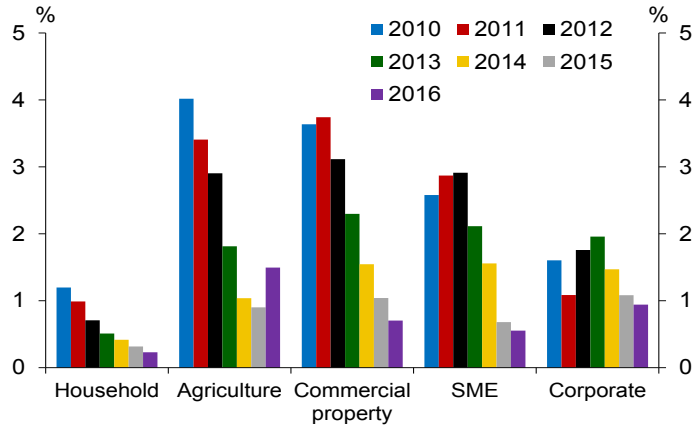
Although bank lending increased strongly in the past year, banks report that credit conditions tightened in the past six months for the household, agriculture and business sectors (figure 4.7). Banks expect lending conditions to tighten further in the next six months, particularly for the business sector, where the price of corporate and commercial property lending is forecast to increase. Commercial property lending standards are expected to tighten as banks take a more conservative stance on commercial and residential property development lending. This could have implications for the evolution of the housing and commercial property risks outlined in chapter 3.

The market for small and medium enterprise loans remains competitive and lending conditions are not expected to change materially in the next six months. However, an increase in corporate lending rates is expected, partly in response to higher funding costs for banks (see the funding risk discussion in chapter 3).

Non-performing loans have continued to fall outside of the agriculture sector.

Benign economic conditions in New Zealand, relative to the GFC period, have enabled banks to reduce their stock of non-performing loans (NPLs). Total NPLs have remained around 0.6 percent since the May *Report*, considerably lower than the 2.2 percent peak in 2011. Low levels of NPLs are seen across most sectors and, over the past year, NPLs have fallen in each sector, except agriculture (figure 4.8).

Figure 4.8 Non-performing loans by sector *(% of sectoral lending, October years)*



Source: Private reporting.

The increase in banks' NPLs to the agriculture sector mainly reflects continued pressures in the dairy sector. Banking system NPLs to the dairy sector increased to 1.9 percent in October, from 1.3 percent in May and, over the same period, watchlist loans increased by over 2 percentage points to 11.6 percent.

Some indicators suggest New Zealand's banking system is operating efficiently.

Despite being relatively concentrated, New Zealand's banking system appears to be operating efficiently from an international perspective (table 4.1). New Zealand ranks high on profitability metrics, which may indicate the banking system is efficient in its use of assets (return on assets), capital (return on equity) and resources (non-interest expenses to gross income).

The profitability metrics may partly reflect the high degree of concentration in New Zealand's banking system.[1] However, banks in New Zealand appear to be relatively efficient in the core intermediation role of receiving money in the form of deposits and recycling that money via loans to creditworthy borrowers. The cost of intermediation in New Zealand, measured by the spread between the weighted average retail lending rate and retail deposit rate, is below the average of 20 OECD countries in the sample. New Zealand banks also have the lowest ratio of NPLs to total lending in a sample of 26 OECD countries.[2]

1 The banking sector is the third most concentrated of a sample of 20 OECD countries, when measured using the Herfindahl index of banks' market share in total assets.

2 The ratio of NPLs to total lending is a fairly simple indicator of the efficiency of the banking system as it reflects a wide range of factors that influence the state of the economy and loan performance.

Table 4.1
Efficiency of New Zealand banking system relative to OECD peers, at Q2 2016 or latest data
(%, unless specified)

	New Zealand	OECD median[a]	OECD maximum	OECD minimum	New Zealand rank[b]
Profitability					
Return on assets[c]	1.4	0.8	1.9	0.1	8 (of 26)
Return on equity[d]	18.6	9.2	19.2	0.3	4 (of 26)
Non-interest expenses to gross income[e]	42	62	76	42	1 (of 24)
Intermediation					
Spread between loan and deposit rates[f] (*basis points*)	233	278	996	115	9 (of 20)
NPLs to total gross lending[g]	0.6	4.4	37.0	0.6	1 (of 26)

Source: European Central Bank, IMF, registered banks' *Disclosure Statements*, private reporting, RBNZ SSR.

Notes:

(a) Median of the sample of OECD countries for which data are available for each metric.

(b) 'New Zealand rank' is scaled so that the top ranking country is the most efficient for that particular metric, i.e., 1 of 20 means New Zealand is the most efficient country of the 20 OECD countries in the sample.

(c) Return on assets = (net annual income before tax / average total assets) x 100; a measure of banks' efficiency in the use of assets.

(d) Return on equity = (net annual income before tax / average total capital) x 100; a measure of banks' efficiency in the use of capital.

(e) Non-interest expenses to gross income = (net annual operating expenses / (net annual interest income + annual non-interest income)) x 100; a measure of banks' efficiency in the use of resources.

(f) Spread between loan and deposit rates = (difference between the weighted average loan rate and weighted average deposit rate, excluding rates on interbank loans and deposits) x 100; a measure of the cost of intermediation.

(g) NPLs to total gross lending = (total non-performing loans / total gross lending) x 100; a measure of banks' allocative efficiency.

Non-bank lending institution sector

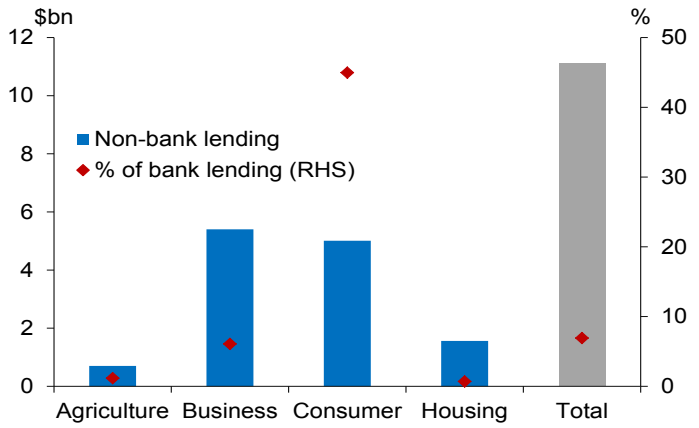
The non-bank lending institution sector is small relative to the banking sector...

The non-bank lending institution (NBLI) sector comprises non-deposit taking finance companies and non-bank deposit takers, such as credit unions, building societies and deposit-taking finance companies. The sector is small in aggregate, with total lending of around $13 billion – equivalent to 3 percent of banking system lending (figure 4.9). However, the sector provides a large share of consumer lending.

...and is growing at a slower rate.

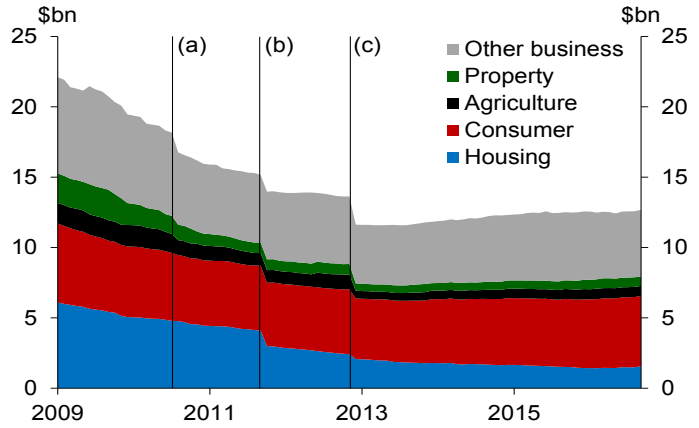
NBLI sector lending nearly halved in size following the GFC, with particularly large declines in housing and non-property business lending (figure 4.10). This mainly reflects NBLI failures and some larger NBLIs gaining bank registration but also weak growth relative to the banking sector. A decline in non-bank housing lending growth suggests that there has been limited leakage from the loan-to-value ratio (LVR) policy. NBLI mortgage lending fell $233 million between the introduction of the LVR policy in October 2013 and September 2016.

Figure 4.9 Stock of NBLI lending, relative to bank lending *(at end-September 2016)*



Source: Private reporting, RBNZ SSR.

Figure 4.10 Non-bank lending by sector



Source: Private reporting, RBNZ SSR.

Notes: The marked lines represent dates when significant NBLIs left the sector:

(a) Failure of South Canterbury Finance.

(b) Exit of PSIS from the sector to become Co-operative Bank.

(c) Exit of Heartland Building Society from the sector to become Heartland Bank.

Insurance sector

The global economic environment remains difficult for insurers…

Low interest rates have depressed investment returns and contributed to a strong supply of capital across insurers and reinsurers. At the same time, growth in emerging markets has slowed and geopolitical risks remain elevated.

These trends, coupled with new entrants, underpin competitive pressures for domestic non-life insurers. These pressures may give rise to higher risk strategies to maintain market share or to improve earnings, including: lowering underwriting standards to generate more business; increasing risk exposures in investment portfolios to improve returns; and returning surplus capital to shareholders. While these strategies may be attractive to insurers and sustainable over short periods of time, they may also undermine the long-term viability of insurers and the position of policyholders.

…and New Zealand insurers have reduced solvency margins.

Following completion of full licensing in 2013, the solvency of the New Zealand insurance sector has generally trended upwards. However, in the past year, the sector paid dividends of about twice its net profit, narrowing solvency margins. Should insurers continue to distribute large dividends, there is a risk that they erode their solvency buffers, reducing their flexibility to manage adverse scenarios (see box B).

Both life and non-life insurers have focused on costs and distribution channels to improve underlying financial performance. A number of insurers are currently renewing core systems and improving digital distribution channels. For life insurers, commissions are a significant distribution cost that have an impact on their profitability and solvency.

Some international life insurers are vulnerable to the low interest rate environment, as it reduces the return on their investments, relative to the cost of the products that they offer. However, the predominance of pure risk products offered by New Zealand's life insurers, for example term life insurance policies, makes them less vulnerable to low interest rates.

The impact of the Kaikoura earthquake is uncertain.

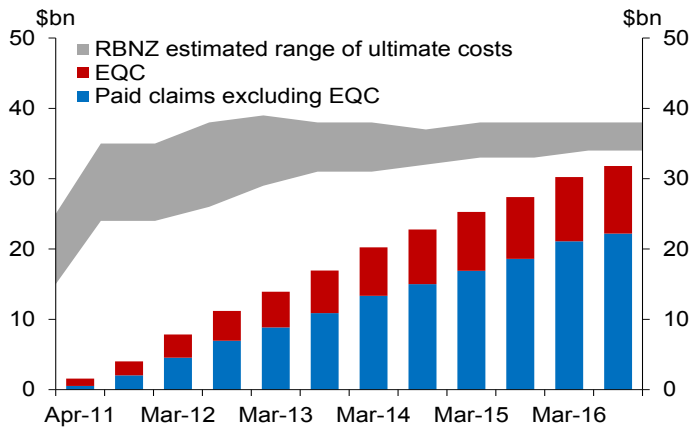
Damage from the magnitude 7.8 Kaikoura earthquake on 14 November is being assessed. It is too early to estimate the financial costs of the earthquake and their impact on insurers. However, private insurers have moved to a sum-insured basis and have about $14 billion more in catastrophe reinsurance and capital than they did at the time of the Canterbury earthquakes. In addition, the Earthquake Commission (EQC) continues to have its Crown guarantee and reinsurance to meet its costs. Accordingly, the insurance sector as a whole appears better positioned than in 2010 to meet their claims and other earthquake-related costs.

Risks around claims relating to the Canterbury earthquakes are easing, although the complexity of remaining claims has slowed the claim payment rate. As at September 2016, insurers had paid $32 billion in Canterbury earthquake claims, compared to $30 billion at the time of the May *Report* (figure 4.11).[3] Paid claims amount to 84-91 percent of the

3 The paid claims numbers have been updated to include claims handling expenses for EQC that had previously been omitted in error. The revision increases claims paid by EQC by $1.4 billion.

Reserve Bank's latest estimates of the total claim cost, which is currently $35-38 billion, a slight increase on previous estimates.

Figure 4.11 Canterbury earthquake paid claims



Source: EQC, RBNZ.

Insurance sector data collection is progressing.

Regular publication of insurance sector information has been further delayed, due to the significant effort required to improve data quality. Some insurers have been responsive to feedback from the Reserve Bank and the quality of their data has improved. The Reserve Bank considers that the transition period for insurers to understand the new data collection requirements has now concluded. Effective 1 January 2017, the Reserve Bank expects insurers to be fully compliant with these requirements and may take enforcement action against insurers who do not meet their obligations.

Financial markets infrastructure

Payment and settlement systems have been operationally stable.

Continuous availability of payment and settlement systems is vital to the smooth and efficient functioning of financial markets and the maintenance of public confidence. During the past six months no significant outages have occurred in the various systems.

Since the May *Report*, the most important systems have operated at near 100 percent availability. The Exchange Settlement Account System (ESAS), in particular, continues to show operational stability and was available 99.8 percent of the year to September 2016. The system was interrupted only twice: once in early April, discussed in the May *Report*, and once in September, when only two participants were affected. ESAS plays a key role in New Zealand's financial system, with all financial transactions in New Zealand involving interbank payments ultimately being settled through ESAS.[4] Consequently, the Reserve Bank, as operator of the system, aims for ESAS to be available at least 99.9 percent of the time.

Separately, the Reserve Bank has been working with participants on a project aimed at reducing the delay between a payment instruction being issued by a customer and it being processed and settled by participants (see box C).

4 This includes single, high-value transactions between banks, and batched-up, low-value transactions.

The Reserve Bank is upgrading the systems it operates.

While the systems operated by the Reserve Bank, ESAS and NZClear, have operated stably, the Reserve Bank plans to upgrade these systems. This follows a decision to retain ownership of NZClear, a real-time clearing and settlement system for high-value debt securities and equities. The upgrade of the current technology, which is nearing the end of its useful life, will help future-proof the systems' operations and provide increased flexibility.

Project planning is well advanced, with key technical decisions made. The project is moving into a two-year implementation phase, with completion scheduled for mid-2018. The Reserve Bank has consulted with industry participants to ensure they understand what is planned, and that their concerns and preferences are taken into account. The Reserve Bank plans to continue to engage stakeholders as implementation proceeds.

The Reserve Bank has engaged industry on the robustness of card payment systems...

Credit and debit cards are important for the efficient functioning of the economy. Payment cards are used extensively for consumer purchases and have a high level of acceptance and market penetration in New Zealand. Any significant outages could severely inconvenience consumers. In recent months the Reserve Bank has engaged with companies that process card transactions and the major banks to better understand the robustness of card payment systems, and what substitutes exist.

A number of steps and parties are involved in processing a payment when a card is used to purchase goods or services in person. This includes the merchant, the processing companies ('switches', i.e. Paymark and EFTPOS New Zealand), the bank responsible for ensuring the merchant receives the money, and the bank that issued the card. Despite this, the Reserve Bank's discussions with the industry have highlighted the technical robustness of card payment systems. Historically, significant outages have been isolated and brief, and the system operators are confident that the systems are very reliable. There are built-in contingency measures that will allow card payment transactions to continue in the short term if the system temporarily goes offline.

...and is encouraging enhancements to the technology.

While the probability of a complete outage is low, there are circumstances in which such an outage may occur. The Reserve Bank's view is that the industry should plan for such an eventuality. The Reserve Bank has encouraged the switches and banks to continue developing ways of enhancing the robustness of the existing technology, and to continue developing new technologies.

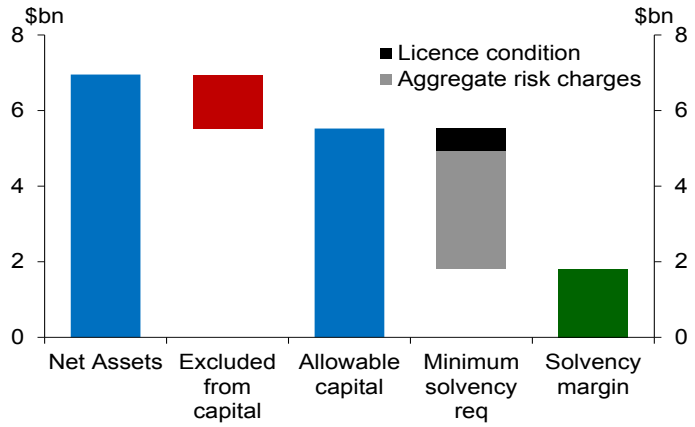
The discussions, however, have supported the Reserve Bank's previous assessment that the switches are not systemically important as they are largely substitutable. Alternative means of payment exist, such as cash, and mobile and internet payments. In addition, it is likely that developments in technology will, in time, enable further means of payment that could substitute for card payments.

Box B

Insurer solvency

This box considers regulatory solvency returns that were provided to the Reserve Bank by licensed New Zealand insurers as at their financial year-end during 2015.[5] In 2015, 62 licensed New Zealand insurers were subject to the Reserve Bank's solvency standards.[6] The aggregate solvency position of these insurers relative to their requirements is set out in figure B1.

Figure B1 Effective solvency requirement



Source: RBNZ.

Note: Solvency margin is adjusted for licence conditions.

5 The analysis has identified some data issues that are relevant generally to insurers as well as some issues that are specific to some individual insurers. The Reserve Bank is providing feedback to insurers as appropriate.

6 A further 34 were subject to solvency requirements in their home jurisdiction.

Insurer solvency requirements

An insurer's capital level for solvency purposes is based on its net asset position, i.e., the value of its assets minus the value of its liabilities. This amounted to nearly $7 billion for insurers subject to the Reserve Bank's solvency requirements, at financial year-end 2015. However, capital instruments must be permanent, loss-absorbing, not impose unavoidable costs, and rank behind policyholders and other creditors on wind up. Therefore, instruments that do not meet these criteria are treated as non-qualifying capital instruments (NQCI) and are excluded when calculating insurers' solvency capital. These amounted to $0.5 million in 2015.

Other deductions to net assets are made when calculating solvency capital, to reflect insurers' outstanding commitments (such as unpaid dividends) or low quality assets. About half of insurers had low deductions (2 percent or less of net assets) but some insurers had deductions as high as 69 percent of net assets. The largest components were deferred tax assets ($600 million) and goodwill and other intangible assets ($600 million).

The Reserve Bank imposes risk-based requirements that allowable capital must exceed. These vary in accordance with the financial risks insurers face, and are also subject to floors (these floors are effective for 18 insurers).[7] In aggregate, at financial year-end 2015, insurers subject to the Reserve Bank's solvency standards were required to have $3.1 billion of capital to cover these risk charges. The most significant components related to insurance and asset risks.

Some insurers are also required by the Reserve Bank to hold additional capital as a condition of their licence, if they have significant risks that

7 The floors are: $1 million for captive insurers, $3 million for non-life and $5 million for life insurers.

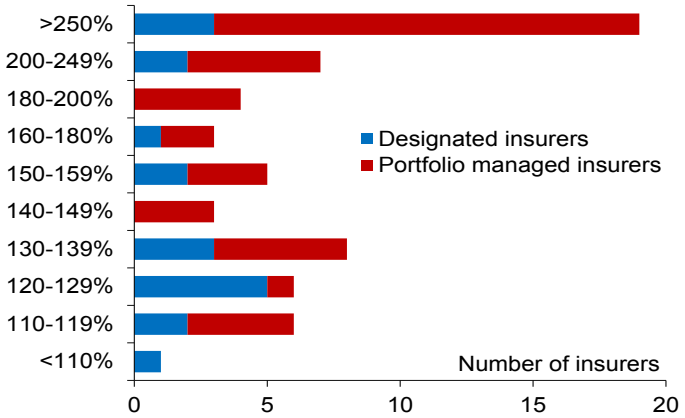
are not appropriately addressed in the solvency standards. As a result of these licence conditions, insurers were required to hold $585 million on top of the aggregate risk charges.

Overall, insurers had a solvency margin of $1.8 billion at financial year-end 2015.

Reported solvency ratios

There was considerable variation in solvency ratios reported at financial year-end 2015. The median Solvency Ratio Adjusted (SRA) was 171 percent, with upper and lower quartiles of 307 percent and 133 percent, respectively.[8] A distribution of SRAs across insurers is shown in figure B2. The proportion of insurers with low SRAs has increased recently.

Figure B2 Distribution of insurers' SRAs



Source: RBNZ.

Note: 'Designated insurers' are licensed insurers who require a greater intensity of supervision, e.g., due to their size. 'Portfolio managed insurers' are all other licensed insurers, who are supervised on a portfolio basis.

8 The Solvency Ratio Adjusted (SRA) is the ratio of an insurer's actual solvency capital to its minimum solvency capital plus its licence condition solvency margin.

Home jurisdiction solvency requirements

Under the Insurance (Prudential Supervision) Act 2010, licensed New Zealand insurers are authorised to be subject to home supervisor solvency requirements in nine approved home jurisdictions. This means that the prudential requirements in the approved jurisdictions are broadly equivalent to New Zealand's for the relevant insurers. The jurisdictions include: Australia (20 insurers); three EU countries (seven insurers); three US states (three insurers) and two Asian countries (four insurers).

Solvency requirements are calculated using a wide range of methods across these jurisdictions, which makes comparisons difficult. There is also considerable variation in reported solvency ratios. For the 19 New Zealand licensed insurers that are subject to Australian solvency requirements, the median legal-entity solvency ratio is 184 percent with upper and lower quartiles of 242 percent and 118 percent respectively.

Chapter 5
Financial institutions and infrastructure

A broad range of policy initiatives is currently under way. The Reserve Bank continues to review the capital requirements for New Zealand banks. The review will be comprehensive and will include the overall level and quality of capital, as well as the standards for calculating capital requirements. The Reserve Bank tightened LVR restrictions in October 2016 in response to house price pressures in Auckland and the rest of the country, and growing bank exposures to property investors. It is too early to assess the impact of that policy change, but the overall LVR policy is judged to have improved bank resilience, although housing market risks remain.

The Reserve Bank continues to work on a number of other prudential initiatives, including the bank outsourcing policy, a new dashboard approach to bank disclosures, a dual registration framework for small foreign banks, revisions to the Insurance (Prudential Supervision) Act 2010, the FMI oversight framework, a residential mortgage-backed securities review, publication of consultation submissions, and changes to the *Banking Supervision Handbook*.

Finally, the IMF has recently completed its final mission as part of its Financial Sector Assessment Program, and will publish its *Financial System Stability Assessment* in early 2017. This will be a comprehensive review of New Zealand's financial system and regulatory framework.

Capital review

The Reserve Bank is currently reviewing all aspects of New Zealand's bank capital requirements. Past *Reports* have explained the rationale for the review, including changes to the Basel Committee on Banking Supervision's (BCBS) international standards for bank capital and the findings of Australia's *Financial System Inquiry*.[1]

The Reserve Bank will develop principles to guide the capital review.

The Reserve Bank will develop a set of principles to help guide the capital review. The principles will build on the Reserve Bank's past approach to capital regulation and its overarching regulatory philosophy, but will also take account of the current domestic financial landscape and international capital regulation.[2] The principles will be relatively high-level, but will provide a framework for considering the various aspects of the review.

1 See http://fsi.gov.au/

2 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Speeches/2016/NZs-evolving-approach-to-prudential-supervision.pdf

Studies will inform the calibration of capital requirements for New Zealand banks...

As part of the review, the Reserve Bank will consider the appropriate amount and quality of capital New Zealand banks should be required to maintain. This will involve a survey of recent academic and central bank studies on optimal capital ratios. Care will be taken when interpreting these studies as they tend to be sensitive to assumptions about the effect of capital on banks' funding costs and the scale of GDP losses that are directly attributable to banking crises. It is also unclear how the inclusion of different types of capital affects the results of these studies.

...as will the level of capital internationally.

The Reserve Bank will also look at international norms when considering calibration of New Zealand's capital requirements. In raw international comparisons, the current capital ratio of New Zealand banks is relatively low.[3] But a simple comparison is potentially misleading as the risk weights that New Zealand banks must apply to certain asset classes are set conservatively. This means New Zealand banks' capital ratios appear lower than foreign banks' ratios for the same underlying portfolios.

After adjusting for the conservative approach New Zealand takes, the Reserve Bank's preliminary assessment is that New Zealand banks' risk-weighted capital ratios have been near or above international norms.[4]

The Reserve Bank will also consider the detail of the standards for calculating capital.

As well as the overall level and quality of capital, the capital review will consider the detail of the standards for calculating the capital requirement, in the light of New Zealand's experience of administering the standards since 2007, and both recent and proposed changes to the BCBS standards for bank capital.

The Reserve Bank will consider the extent to which banks should apply internally modelled approaches to credit and operational risks, and whether modelled approaches should be limited to a narrower range of portfolios. The review will also consider the relationship between modelled and standardised approaches, and whether outputs of modelled approaches should be more closely aligned to standardised outcomes.

This will complement the BCBS's recent consultation on changes to its standards for credit and operational risk capital. The Reserve Bank is not obliged to follow the BCBS standards and will not do so if it is contrary to New Zealand's interests. But the Reserve Bank's current standards are closely aligned to the BCBS standards and the Reserve Bank regards the BCBS standards as an important benchmark.

The Reserve Bank expects to consult in early 2017.

The Reserve Bank's capital review has commenced but is at an early stage and no decisions have been made. The Reserve Bank will consult publicly before decisions are made, likely in early 2017.

3 For example, see the IMF's "GFSR FSI Tables": http://data.imf.org/?sk=9F855EAE-C765-405E-9C9A-A9DC2C1FEE47&ss=1412342664798

4 Australia also takes a conservative approach. The Australian Prudential Regulation Authority concluded that, because of this approach, the capital ratios of its major banks are understated – relative to those in less conservative jurisdictions – by 1-3 percentage points (see http://www.apra.gov.au/adi/PrudentialFramework/Documents/150710-International-capital-comparison-information-paper.pdf). New Zealand's approach has been more conservative than Australia's in a number of areas, so we expect that the understatement would be greater in New Zealand's case.

Loan-to-value ratio restrictions

LVR restrictions are designed to enhance the resilience of banks…

Restrictions on mortgage lending at high loan-to-value ratios (LVR) were introduced in October 2013 in response to rising housing market vulnerabilities and concerns that the scale of high-LVR lending was accentuating these vulnerabilities. High-LVR borrowers are more limited than other borrowers in their ability to borrow additional money to manage periods of lower income in an economic downturn, leading to higher default rates. High-LVR loans also lead to larger losses for banks if borrowers do default, particularly in the event of significant house price declines.

While stress tests suggest that banks are likely to be able to absorb losses that arise in a housing market downturn, they also suggest that banks would tighten credit standards materially to restore their capital ratios. The ensuing credit contraction would amplify the economic downturn, by decreasing investment and consumption, and would amplify house price declines, by increasing foreclosures and forced sales. LVR restrictions help mitigate the potential scale of credit contraction in a downturn by protecting bank balance sheets from losses and firesale risks.

…and have changed as housing risks have evolved.

In November 2015, LVR restrictions were tightened for lending to property investors in the Auckland region, in response to a significant increase in lending to that group who carry a greater default risk.

In July 2016, the Reserve Bank consulted on a further tightening of LVR restrictions in light of imbalances in the Auckland market reaching more extreme levels, house price pressure spreading to the rest of the country, and growing bank exposures to investors. These changes were implemented on 1 October and require that:

- no more than 5 percent of new bank lending to residential property investors is undertaken at LVRs of greater than 60 percent; and
- no more than 10 percent of new bank lending to owner-occupiers is undertaken at LVRs of greater than 80 percent.

During consultation, submitters raised concerns that tighter LVR restrictions could impede financing of new property construction. As a result, the Reserve Bank extended the boundary of the exemption to the LVR policy for construction lending to accommodate purchases from initial property developers.[5]

LVR restrictions have improved bank resilience…

As discussed in chapter 3, the LVR policy has led to a significant reduction in the share of high-LVR loans on bank balance sheets (figure 3.7) and leaves banks better placed to withstand a housing market downturn. In particular, the changes to the LVR policy in November 2015 and October 2016 have started to reduce banks' exposure to investors with high LVRs (figure 5.1).

5 A Summary of Submissions and Regulatory Impact Statement are available at http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/consultations/Response-to-lvr-submissions-september-2016.pdf?la=en and http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/consultations/regulatory-impact-assessment-2016-lvr-changes.pdf?la=en

The level of house prices is also likely to be somewhat lower now than it would have been without LVR restrictions. But fundamental factors, such as limited supply growth and high immigration, have continued to support high house price inflation across New Zealand. As a result, the Reserve Bank has kept the LVR policy in place for over three years despite LVR restrictions being a temporary tool. LVR restrictions may need to remain in place until the sustained housing pressures abate.

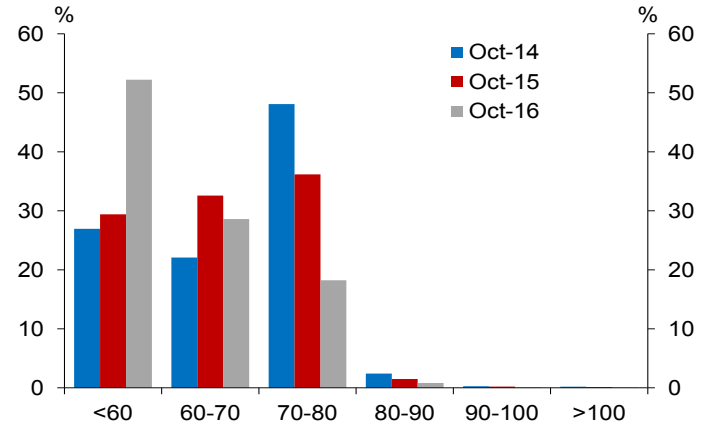
Overall, the LVR policy has likely prevented some prospective house buyers from entering the market, but first-home buyers' share of house purchases has remained relatively stable, at around 20 percent. Banks have allocated close to half of their new high-LVR loans to this group, with around 30 percent of first-home buyers still borrowing at high LVRs. A significant number of buyers have also been able to meet higher deposit requirements through other sources such as loans from family members.

The LVR policy has not caused a material number of high-LVR borrowers to shift their borrowing to lending institutions to which the LVR restrictions do not apply. While there has been some increase in the number of mortgages registered by non-bank lending institutions since 2013, total mortgage lending by these institutions has declined by $233 million since October 2013.

...but financial stability risks from the housing market remain.

LVR restrictions have enhanced banks' resilience to a housing downturn, but the impact of the restriction has been narrowly focused, by design. While it has reduced the banking system's exposure to high-LVR borrowers, banks have increased lending to other risky borrowers, namely, those with high debt-to-income (DTI) ratios.

Figure 5.1 LVR distribution of new commitments to investors *(3-month moving average, % of total new commitments to investors)*



Source: RBNZ *New Residential Mortgage Commitments Survey.*

Note: Data is for new commitments before exemptions to the LVR restrictions are applied.

Financial Sector Assessment Program

The IMF recently completed its second and final mission as part of its Financial Sector Assessment Program (FSAP), a comprehensive review of New Zealand's financial system and regulatory frameworks.[6] The last New Zealand FSAP took place in 2003. Since that time there has been significant change in the regulatory landscape. For example, the Financial Markets Authority (FMA) was formed to oversee New Zealand's capital markets and the Reserve Bank has assumed additional responsibilities in relation to insurers, non-bank deposit takers (NBDTs) and anti-money laundering. The Reserve Bank has also strengthened its regulation of the banking system, with the implementation of the Basel III capital framework, a liquidity policy and the Open Bank Resolution policy designed to address the 'too-big-to-fail' problem.

6 See http://www.rbnz.govt.nz/research-and-publications/reserve-bank-bulletin/2016/rbb2016-79-07

The first mission involved two formal 'graded' assessments of the regulatory frameworks for the banking and insurance sectors against the respective international standards.[7] This exercise identified a number of areas where New Zealand's regulatory approach does not fully comply with international standards. In many cases, differences reflect specific features of New Zealand's financial system and the distinctive approach the Reserve Bank takes to prudential regulation. The Reserve Bank generally takes a less intrusive and more risk-based approach, emphasising that the directors and senior management of regulated entities should be held primarily responsible for managing the risks facing their firm.

The first mission also examined New Zealand's crisis management and resolution framework for banks, insurers and NBDTs, and in particular the role of Open Bank Resolution as an option for managing and resolving a bank under financial stress. The IMF also evaluated current proposals to improve the oversight of FMIs.

The second mission focused on the Reserve Bank's macro-prudential policy framework, introduced in 2013, and New Zealand's securities regime (capital markets), overseen by the FMA and the Ministry of Business, Innovation and Employment.

Across both missions there were meetings related to stress testing exercises for New Zealand's banking system. These include a 'top-down' analysis (done independently by the IMF and RBNZ) analysing how large bank balance sheets would be impacted by a macroeconomic downturn, as well as tests analysing other potential risks, such as liquidity shortfalls.

New Zealand's authorities have provided comments to the IMF on the reports from both missions. The findings and recommendations contained in these reports highlight a number of areas where New Zealand's approach to financial sector regulation departs from various international standards and benchmarks. The Reserve Bank and other relevant New Zealand authorities will carefully consider the IMF's findings and recommendations, and the extent to which they can help to improve the current approach to financial sector regulation and supervision.

The IMF will publish its *Financial System Stability Assessment* of New Zealand, as well as a number of individual reports that comprise that assessment, around April next year.

Update on other regulatory projects

Bank outsourcing policy

The outsourcing policy was discussed in depth in the May *Report*. The objective of the policy is to ensure that a bank has the legal and practical ability to control and execute outsourced functions, so that it can continue to provide basic banking services. This is important to minimise the impact of failures or service provider dysfunction on the wider economy, and to preserve options for the resolution of banks.

In May 2016, a second consultation paper on the review of the outsourcing policy for registered banks was released.[8] This paper

7 The international standards for the banking sector have been developed by the BCBS, while the relevant standards for the insurance sector have been issued by the International Association of Insurance Supervisors.

8 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/consultations/Final-consultation-outsourcing-policy-for-registered-banks-May2016.pdf?la=en

reconsidered a number of proposals from the 2015 consultation to mitigate their impact on banks while still addressing the policy concerns. Most of the key proposals in the May consultation were based on direct feedback from affected stakeholders.

The second consultation closed in August and submissions are being reviewed. During the consultation, numerous meetings with banks and stakeholders were held, along with a banking industry workshop.

Final policy decisions, a summary of submissions and a regulatory impact statement are expected to be released in December 2016. In early 2017, an exposure draft of the revised policy is expected to be released for consultation before a final policy statement.

Dashboard approach to quarterly disclosure

The dashboard proposal involves publishing quarterly information on locally incorporated banks in a standardised and comparable manner. The dashboard would replace the requirement for locally incorporated banks to prepare off-quarter disclosure statements. Information for the dashboard would be largely drawn from information banks privately report to the Reserve Bank, which will help minimise compliance costs.

The dashboard should enhance market discipline by bringing key information on different locally incorporated banks together in one place, which will help depositors, investors and analysts to compare the risks and financial position of these banks.[9]

On 23 September, the Reserve Bank released a consultation document on the proposed new dashboard approach.[10] Submissions close on 15 December 2016 and the Reserve Bank aims to publish individual submissions (where consent is provided) and a response to submitters' comments, in early 2017.

The consultation document also sets out a potential alternative to the dashboard based on a more tailored version of existing off-quarter disclosure statements, and covers various other related matters.

A dual registration framework for small foreign banks

In recent years, several foreign-owned banks have sought to register a branch alongside their existing New Zealand subsidiary, arguing that this 'dual registration' would better facilitate local lending opportunities.

In June, the Reserve Bank consulted on a revised approach to dual registration intended to clarify expectations on applicants.[11] The proposed framework would apply only to banks with non-systemic, locally incorporated operations, considering:

- the benefits to New Zealand from authorising a dual-registered branch, for example enhanced competition, product innovation or funding diversification;
- the risks of dual registration, chiefly stemming from insufficient self, market or regulatory discipline for banks domiciled in 'non-equivalent' jurisdictions;

9 Market discipline, regulatory discipline and self discipline are the 'three pillars' that make up the Reserve Bank's approach to banking supervision.

10 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Policy-development/Banks/Dashboard-approach-to-quarterly-disclosure/Dashboard-consultation-Sept2016.pdf?la=en

11 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/banks/consultations/consultation-paper-dual-registration-framework-small-banks.pdf?la=en

- whether branch restrictions might mitigate these risks; and
- whether benefits from granting dual registration outweigh the risks.

The Reserve Bank would expect dual-registered branches to engage in simple wholesale business only. However, additional formal restrictions tied to the size or functions of certain branches may be warranted to mitigate outcomes inconsistent with the Reserve Bank's supervisory approach. Enhanced governance requirements would also strengthen branch accountability and align private incentives with public interests.

The dual registration proposal would attempt to balance greater competition and efficiency in the local banking sector, against the preservation of financial system soundness. A summary of submissions and final policy proposal are expected to be released late this year.

IPSA review

In April this year, the Reserve Bank released the terms of reference for a review of the Insurance (Prudential Supervision) Act 2010 (IPSA).[12] The Reserve Bank is currently preparing an issues paper intended for release in December 2016. The paper will outline the areas the Reserve Bank has identified that may need further consideration within the review, and will seek views from interested parties on these issues. The issues paper will also seek feedback on any other areas that stakeholders consider should be included within the review. It is intended that the issues paper will be open for consultation until around the end of March 2017.

The FSAP assessment of the regulatory and supervisory framework for the insurance sector has provided timely input to the review's objective to assess the consistency of the regime with international guidance. The Reserve Bank and other relevant New Zealand authorities will carefully consider the findings and recommendations of the FSAP assessment.

Following the consultation on the issues paper and the authorities' consideration of the FSAP recommendations, the Reserve Bank will finalise those areas that will be taken forward for further consideration in the review. The Reserve Bank will then hold further consultation meetings over 2017 in respect of these issues before issuing an options paper for consultation. Any legislative change would not occur before 2018, at the earliest.

Financial market infrastructures oversight framework

The Reserve Bank concluded the last part of its consultation on the FMI oversight framework on the topic of crisis management powers for 'systemically important financial market infrastructures', in May this year. Eight submissions were received and the majority of the submitters were supportive of the proposed framework. A summary of submissions was published in August.[13]

The Reserve Bank has now finalised the overall proposal for an enhanced oversight framework for FMIs. Subject to Cabinet agreeing to the proposal, the Reserve Bank will publish the relevant cabinet paper and regulatory impact statement on its website and plans to consult again via an exposure draft of the proposed legislation, in 2017.

12 See http://www.rbnz.govt.nz/regulation-and-supervision/insurers/review-of-the-insurance-prudential-supervision-act-2010

13 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/financial-market-infrastructure-oversight/2016-08-summary-of%20submissions-on-FMI-crisis-management.pdf?la=en

Residential mortgage-backed securities review

The Reserve Bank manages banking system liquidity by providing deposit and lending facilities to banks and other counterparties. Banks that need liquidity can pledge eligible securities to the Reserve Bank, effectively as collateral for a loan. Eligible securities include approved residential mortgage-backed securities (RMBS) which are backed by pools of mortgages written by banks. These are subject to 'haircuts', meaning that the value of securities pledged needs to be larger than the loan sought.

The Reserve Bank has been discussing these arrangements with some banks and private investors. One consideration is whether RMBS could be structured in a way that better enables them to be sold to investors (e.g., superannuation funds) as well as being eligible at the Reserve Bank. The Bank for International Settlements has recently published guidelines for ensuring securitisations are simple, transparent and comparable. The Reserve Bank is interested in whether RMBS structured this way could improve understanding of the underlying collateral and develop RMBS markets in New Zealand. The capital regime for securitisations will also be considered as part of the Reserve Bank's capital review, outlined above.

Publication of consultation submissions

In May, the Reserve Bank published a consultation paper on whether it should begin publishing individual submissions received in response to consultations.[14] Previously, only anonymised summaries of submissions had been proactively published alongside policy decisions resulting from consultation. After considering the feedback, the Reserve Bank has decided to publish submissions received to future consultations, when consent is granted, with submitters making any redaction themselves. The Reserve Bank believes this change will enhance the transparency of the policy-making process.

Feedback received during consultations is still potentially subject to release if requested under the Official Information Act 1982 (an OIA request). However, release may be restricted by confidentiality provisions in legislation that requires prudential information about an entity regulated by the Reserve Bank to be withheld.[15] Specific consent by respondents may permit some prudential material to be published by the Reserve Bank, or released in response to an OIA request. The first consultation affected by the new policy is the consultation on the dashboard approach to quarterly disclosure (see above) which closes on 15 December 2016.

Changes to the Banking Supervision Handbook

The *Banking Supervision Handbook* is the collection of documents that provides the details for most of the regulatory requirements applying to banks. A key strand of work within the *Regulatory Stocktake* was to identify ways to improve the grouping and layout of the material in the *Banking Supervision Handbook*.[16] The stocktake *Feedback Statement* summarised the proposed changes to the *Banking Supervision Handbook*, and included a high-level project plan for implementing them (see appendix C of the *Feedback Statement*).[17]

14 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/stocktake/Consultation%20paper-Review%20of%20the%20Default%20Option%20for%20the%20Publication%20of%20Submissions.pdf?la=en

15 The three Acts referred to are the Reserve Bank of New Zealand Act 1989, the Insurance (Prudential Supervision) Act 2010 and the Non-bank Deposit Takers Act 2013.

16 See the November 2015 *Report* for a summary of the Stocktake.

17 See http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/stocktake/feedback-statement.pdf?la=en

The Reserve Bank is working through this plan, although the timing of the stages has slipped compared to the published version, and the whole project will not be completed before end-2017. Work is continuing on the first and most complex stage, which involves making the capital adequacy requirements clearer and easier to navigate. As suggested in the consultation feedback, the Reserve Bank has set up a small working group of individuals from banks to provide feedback on sections of text before whole documents go out for formal consultation.

Planned regulatory policy development

There are a number of other areas where policy development has been delayed and is now expected to begin next year. These include:

- Securitisation legislative changes: securitisation is one mechanism that banks have available to raise debt funding. Securitisation involves the sale of assets originated by one entity, to another entity (a special purpose vehicle) that issues securities to fund the purchase of those assets. Security holders then receive payments from the securitised asset pool. The Reserve Bank is planning to consult on several technical legislative changes regarding securitisation. The proposed changes may also reflect the findings of the RMBS review, outlined above.

- Liquidity review: the Reserve Bank plans to review the prudential liquidity policy for locally incorporated banks that was introduced in 2010. The Reserve Bank will consider whether there are benefits in harmonising New Zealand's approach with the liquidity standards developed by the BCBS.

Box C

Changes to the settlement of retail payments

The processing of retail payments in New Zealand has recently undergone a number of important changes. The most noticeable change for customers has been a move to processing payments throughout the day, increasing the speed of payments. And work is currently being undertaken to achieve further improvement.

The first major overhaul of the retail payment systems was in 2012, when Settlement Before Interchange (SBI) was introduced. This replaced the previous model in which payments were centrally cleared throughout the business day and participant banks settled with each other once, the following business day. Instead, the SBI model allowed participants to exchange payment instructions with each other multiple times throughout a business day, with payments combined into smaller batches. The main improvement was the significant reduction of inter-participant settlement risk – the risk that one participant fails to meet its payment obligations to another participant. Under SBI, inter-participant obligations are established and discharged just before the payment instructions are exchanged.

Although the introduction of SBI was a major step forward, the Reserve Bank was concerned about the settlement risk between underlying customers. There was little incentive for banks to process payment instructions soon after they were received (given SBI significantly reduced inter-participant settlement risk), so the processing of payments was heavily skewed towards the evening. A payer still faced the risk that their bank might fail in the period between their account being debited and the payment being processed, causing the payment to not reach the payee.

Delaying payment processing could also increase banks' liquidity risk, as banks need to ensure that they have sufficient funds to settle more payments towards the end of the day. It also increases operational risk as it limits the time available to resolve outages or disruptions before the end of the day.

To address these risks, since 2014, the Reserve Bank has been working with participant banks to reduce the delay between a payment instruction being issued by a customer and it being processed and settled by banks. The project is expected to conclude by the end of December 2016, with the following changes implemented:

- Payment instructions issued by a customer during the business day will be processed without undue delay. Banks will download payment instructions into SBI files at least hourly and submit those files for settlement. This is expected to mitigate customer-to-customer settlement risk.

- Existing recurring instructions, such as automatic payments for rent, will be processed earlier in the day to reduce customers' uncertainty over whether payments will be settled on the day they are due.

- Customers' accounts will reflect payments in a timely manner, including both funds entering and leaving an account.

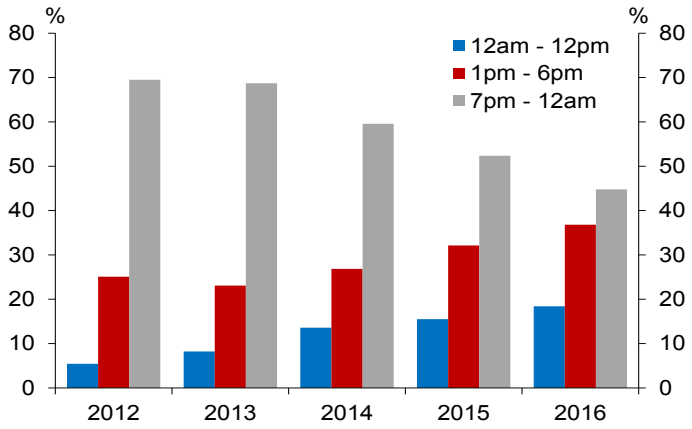
A parallel project led by Payments NZ will also ensure funds posted to customer accounts are 'cleared funds', meaning they cannot be unwound (unless due to fraud), reducing uncertainty around the status of funds. This essentially removes the ability for banks to dishonour an electronic credit due to insufficient funds. The change will only apply to electronic

credits (direct credits, bill payments and automatic payments) and not to direct debits.

Banks involved in this project have made significant changes to their systems in the past two years to ensure they can deliver these changes. The share of transactions that are settled early in the day has been increasing since 2012, and we expect this trend to continue (figure C1).

These changes will benefit banks by reducing both liquidity and operational risks. Customers will also benefit as payments will be processed and settled within a couple of hours, during a business day.

Figure C1
Distribution of payment settlement times
(% of total settlements, by value)



Source: RBNZ.

Note: 2012 data are based on March to December 2012, and 2016 data are based on January to October 2016.

Appendices

Appendix 1

Reserve Bank enforcement

The Reserve Bank has responsibility for enforcing the regulatory obligations of entities in a number of areas, comprising banking, insurance, payments and settlements, non-bank deposit-taking, anti-money laundering and countering the financing of terrorism. The Reserve Bank monitors entities' compliance with the obligations it oversees. In responding to identified non-compliance by an entity, the Reserve Bank may consider it appropriate to take enforcement action. As of 25 November 2016, the Reserve Bank has not undertaken any public enforcement action in the previous 12 months.

Appendix 2

Presentations May-November 2016

The Reserve Bank presented on financial stability and related topics to the following sectors and regions:

Financial services (2)	Auckland
Sectors (2)	Queenstown, Auckland
Advisers (14)	Christchurch, Wellington, Auckland, Sydney, Singapore
Business groups (17)	Invercargill, Queenstown, Dunedin, Ashburton, Christchurch, Blenheim, Wellington, Masterton, Palmerston North, Gisborne, Rotorua, Tauranga, Hamilton, Auckland, Whangarei
Universities (2)	Auckland, Wellington

The Reserve Bank also speaks to a range of audiences on monetary policy and related topics. They are reported in the *Monetary Policy Statement*.

Appendix 3

Table 1
Registered banks' market share, credit rating, parent and country of parent (*as at 30 June 2016*)

Registered bank's name	Market share[1]	Total assets ($bn)	Credit ratings			Ultimate parent	Country of parent
			S&P	Fitch	Moody's		
Australia and New Zealand Banking Group Limited (B)[2]	1.3	6.6	AA-	AA-	Aa2	Australia and New Zealand Banking Group Limited	Australia
ANZ Bank New Zealand Limited	32.0	160.3	AA-	AA-	Aa3	Australia and New Zealand Banking Group Limited	Australia
Commonwealth Bank of Australia (B)	0.9	4.5	AA-	AA-	Aa2	Commonwealth Bank of Australia	Australia
ASB Bank Limited	16.3	81.6	AA-	AA-	Aa3	Commonwealth Bank of Australia	Australia
Bank of Baroda (New Zealand) Limited	0.0	0.1	-	BBB-	-	Bank of Baroda	India
Bank of China (New Zealand) Limited	0.1	0.4	-	-	A1	Bank of China	China
Bank of India (New Zealand) Limited	0.0	0.1	BB+	-	-	Bank of India	India
Bank of New Zealand	18.4	92.1	AA-	AA-	Aa3	National Australia Bank	Australia
China Construction Bank (New Zealand) Limited	0.1	0.5	A	-	A1	China Construction Bank	China
Citibank N A (B)	0.5	2.3	A	A+	A1	Citigroup Inc.	USA
Heartland Bank Limited	0.7	3.5	-	BBB	-	Heartland New Zealand Limited	New Zealand
Industrial and Commercial Bank of China (New Zealand) Limited	0.1	0.7	A	-	A1	Industrial and Commercial Bank of China	China
JPMorgan Chase Bank NA (B)	0.2	1.2	A+	AA-	Aa3	JPMorgan Chase & Co	USA
Kiwibank Limited	3.9	19.4	A+	AA+	Aa3	New Zealand Post Limited	New Zealand
Kookmin Bank (B)	0.1	0.4	A	-	A1	Kookmin Bank	South Korea

(continued)

Registered bank's name	Market share[1]	Total assets ($bn)	Credit ratings			Ultimate parent	Country of parent
			S&P	Fitch	Moody's		
Coöperatieve Rabobank U.A. (B)	0.7	3.6	A+	AA-	Aa2	Coöperatieve Rabobank U.A.	Netherlands
Rabobank New Zealand Limited	2.2	11.1	A	-	-	Coöperatieve Rabobank U.A.	Netherlands
Southland Building Society	0.7	3.5	-	BBB	-	Southland Building Society	New Zealand
The Bank of Tokyo-Mitsubishi UFJ Limited(B)	0.6	2.9	A+	A	A1	Mitsubishi UFJ Financial Group Inc.	Japan
The Co-operative Bank Limited	0.4	2.1	-	BBB-	-	The Co-operative Bank Limited	New Zealand
The Hongkong and Shanghai Banking Corporation Limited (B)	1.1	5.4	AA-	AA-	Aa2	HSBC Holdings PLC	UK
TSB Bank Limited	1.3	6.5	-	A-	-	TSB Community Trust	New Zealand
Westpac Banking Corporation (B)	1.5	7.5	AA-	AA-	Aa2	Westpac Banking Corporation	Australia
Westpac New Zealand Limited	16.9	84.7	AA-	AA-	Aa3	Westpac Banking Corporation	Australia

1 Each registered bank's assets as a proportion of the total assets of the banking system, as at 30 June 2016. Weights do not sum to 100 due to rounding.

2 Banks marked (B) operate in New Zealand as branches of overseas incorporated banks. All other banks are incorporated in New Zealand.

Source: Registered banks' *Disclosure Statements*.

Table 2
New Zealand financial system assets and liabilities (*as at 31 December*)

Financial system liabilities										
$bn	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016***
Banks										
Households	79	90	92	97	106	115	125	137	152	156
Other residents	98	114	103	104	108	120	125	131	141	146
Non-residents	111	127	132	127	122	112	108	108	114	118
Other liabilities and equity	43	72	53	53	60	59	55	61	73	85
Total	**332**	**403**	**380**	**382**	**395**	**407**	**414**	**435**	**479**	**505**
Other non-bank lending institutions										
Households	12	9	9	7	5	3	3	3	3	3
Other residents	8	7	6	7	7	6	5	6	6	6
Other liabilities and equity	12	11	9	7	5	5	5	5	5	6
Total	**31**	**27**	**24**	**21**	**17**	**14**	**14**	**14**	**15**	**15**
Funds under management										
Household assets	63	55	61	64	66	75	84	95	107	113
Other sector assets	11	8	10	10	10	10	11	13	13	15
Total	**74**	**63**	**70**	**74**	**76**	**84**	**95**	**108**	**120**	**127**
Total financial system liabilities	**437**	**493**	**474**	**477**	**488**	**505**	**523**	**557**	**615**	**647**

*As at 30 June.

Financial system assets

$bn	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
Banks										
Households	153	163	169	173	177	185	196	205	221	231
Other residents	127	149	136	137	141	149	151	156	168	172
General government	4	6	14	17	20	20	18	17	16	16
Non-residents	15	16	16	13	10	12	14	19	27	26
Other assets	33	70	44	41	47	41	35	38	48	59
Total	**332**	**403**	**380**	**382**	**395**	**407**	**414**	**435**	**479**	**505**
Other non-bank lending institutions										
Households	14	12	10	9	7	6	6	6	6	6
Other residents	13	12	11	9	7	6	6	6	7	7
Other assets	4	4	3	3	3	2	2	2	2	2
Total	**31**	**27**	**24**	**21**	**17**	**14**	**14**	**14**	**15**	**15**
Funds under management										
Domestic assets	42	38	40	41	43	48	52	55	62	66
Overseas assets	31	25	30	33	32	36	44	52	59	61
Total	**74**	**63**	**70**	**74**	**76**	**84**	**95**	**108**	**120**	**127**
Total financial system assets	**437**	**493**	**474**	**477**	**488**	**505**	**523**	**557**	**615**	**647**

*As at 30 June.
Source: RBNZ surveys
Notes: General insurance companies not included. Totals and sub-totals may not add due to rounding.