Monetary Policy Statement

May 2021

RESERVE BANK
OF NEW ZEALAND
TE PŪTEA MATUA

Statement of the MPC's monetary policy strategy

The Monetary Policy Committee's (MPC) monetary policy strategy is its overarching plan for how it will formulate monetary policy under different circumstances to achieve its objectives.[1] It outlines a consistent approach to how the MPC intends to achieve its objectives across time, accounting for trade-offs and uncertainty. Agreeing on and publishing a strategy promotes transparency, public understanding, and accountability.

Monetary policy framework and objectives

Under the *Reserve Bank of New Zealand Act 1989* (the Act), the MPC is responsible for formulating monetary policy to maintain a stable general level of prices over the medium term and to support maximum sustainable employment.[2] Operational objectives for monetary policy are set out in the **Remit**. The current *Remit* sets out a flexible inflation targeting regime, under which the MPC must set policy to:

- keep future annual inflation between 1 and 3 percent over the medium term, with a focus on keeping future inflation near the 2 percent mid-point; and
- support maximum sustainable employment, considering a broad range of labour market indicators and taking into account that maximum sustainable employment is largely determined by non-monetary factors.

In pursuing these objectives, the *Remit* requires the MPC to have regard to the efficiency and soundness of the financial system, seek to avoid unnecessary instability in the economy and financial markets, and discount events that have only transitory effects on inflation. The MPC must also assess the effect of its monetary policy decisions on the Government's policy to support more sustainable house prices.

The Reserve Bank's flexible inflation targeting framework and the MPC's monetary policy strategy reflect the fact that:

- low and stable inflation is monetary policy's best long-run contribution to the well-being of New Zealanders;
- in the short to medium term, monetary policy can influence real variables such as employment, and hence policy trade-offs can arise; and
- monetary policy is more effective if the Bank's policy targets are credible, so policy should be formulated in a way that ensures credibility is maintained.

Key aspects of monetary policy strategy

The MPC practises **forecast targeting**, which means that it sets monetary policy such that it expects to achieve its inflation and employment goals in the medium term. In most instances the MPC aims to return inflation to the target mid-point within a one to three year horizon. The appropriate horizon at each policy decision will vary based on how different policy paths will contribute to maximum sustainable employment, whether price-setters' expectations are consistent with the inflation target, and other considerations such as the balance of risks to the MPC's central economic outlook.

1 For a more in-depth discussion of monetary policy strategy in New Zealand, see J. Ratcliffe and R. Kendall (2019), 'Monetary policy strategy in New Zealand', Reserve Bank of New Zealand, *Bulletin*, Vol. 82, No. 3, April.

2 These economic objectives contribute to the overall purpose of the Act, which is to promote the prosperity and well-being of New Zealanders, and contribute to a sustainable and productive economy. See monetary policy framework for more information on New Zealand's monetary policy framework, including the full text of the *Remit*.

The MPC does not attempt to return inflation and employment to target immediately, because monetary policy actions take time to transmit through the economy. Attempting to return inflation to target too quickly would result in unnecessary instability in the economy and financial markets. The 1 to 3 percent target range for inflation provides the MPC with flexibility to ensure that managing inflation variability does not come at the cost of excessive variability in the real economy. For similar reasons, the MPC does not attempt to offset events that are expected to have only transitory effects on inflation.

The MPC **takes into account both its inflation and employment objectives** when setting policy. In the long run, no trade-off exists between the MPC's objectives. In the short to medium term, there may be situations where monetary policy can move one objective closer to target only at the cost of the other, resulting in a trade-off. When a trade-off does arise, the MPC will consider outcomes for both objectives in setting policy. In general, if employment is projected to be below its long-run sustainable level, the MPC would let inflation overshoot the target mid-point for a time, and vice versa (while staying within the 1–3 percent target range).

The MPC **responds to both deviations above target and deviations below target**. The MPC sets policy to stabilise employment near its maximum sustainable level, and to return inflation near to the target mid-point, regardless of whether inflation is currently below or above 2 percent. This approach helps to anchor inflation expectations at the target mid-point and promotes sustainable growth and employment by dampening fluctuations in the business cycle.

The MPC **considers the balance of risks** to its objectives that arise from uncertainty about the economic outlook and the transmission of its policy decisions. In general, the MPC will incorporate likely future developments into its central economic projections and set monetary policy in response.

However, the MPC will also take into account risks to its central projections when setting policy. Under extreme uncertainty, the MPC may choose to publish scenarios instead of central projections to illustrate the range of possible situations and economic outcomes that could occur when circumstances are highly unpredictable.

The MPC **has regard to the efficiency and soundness of the financial system**, while recognising that in most instances prudential policy is better suited to leaning against risks to financial stability. The RBNZ takes prudential policy settings into account when setting monetary policy, and vice versa.

Implementation of strategy

The MPC applies the following process when formulating a policy decision:

1. Firstly, it assesses the outlook for the economy and the implications for its policy objectives. It then discusses risks to achieving its policy objectives.

2. Next, it considers which stance of monetary policy is most consistent with its monetary policy strategy given the current economic outlook, risks, and trade-offs.

3. Finally, the MPC decides how it will achieve the desired stance of monetary policy, including whether or not to adjust its policy settings at the current meeting and how it will communicate the policy outlook. The MPC has a **suite of monetary tools** to achieve its goals, and uses its **Principles for Monetary Tools** to make decisions on which tools to deploy.

REPORT AND SUPPORTING NOTES PUBLISHED AT:

www.rbnz.govt.nz/monetary-policy/monetary-policy-statement

Subscribe online: www.rbnz.govt.nz/email-updates

This report is published pursuant to section
15C of the *Reserve Bank of New Zealand Act 1989*.

ISSN 1770-4829

Monetary Policy Statement

May 2021

Scenarios and data finalised on 21 May 2021.
Policy assessment and summary record of meeting finalised on 26 May 2021.

Contents

Chapter 1
Policy assessment

Tēnā koutou katoa, welcome all.

The Monetary Policy Committee agreed to maintain the current stimulatory level of monetary settings in order to meet its consumer price inflation and employment objectives. The Committee will keep the Official Cash Rate (OCR) at 0.25 percent, and the Large Scale Asset Purchase and Funding for Lending programmes unchanged.

The global economic outlook has continued to improve, with ongoing fiscal and monetary stimulus underpinning the recovery. New Zealand's commodity export prices have benefited from this rise in global demand. However, divergences in economic activity, both within and between countries, remain significant. The sustainability of the global economic recovery remains dependent on the containment of COVID-19.

The near-term economic data will continue to be highly variable. While economic growth in New Zealand slowed over the summer months following an earlier strong rebound, construction activity remains robust. The aggregate level of employment has also proved resilient, while fiscal spending continues to support domestic economic activity.

However, tourism-related business activity continues to be affected by the absence of international visitors, with the recent opening of trans-Tasman travel expected to only partially offset revenue losses. The extent of the dampening effect of the Government's new housing policies on house price growth and hence economic activity will also take time to be observed.

Overall, our medium-term outlook for growth remains similar to the scenario presented in the February *Statement*. Confidence in the outlook is rising as the more extreme negative health scenarios wane given the vaccination progress globally. We remain cautious however, given ongoing virus-related restrictions in activity, the sectoral unevenness of economic recovery, and the weak level of business investment.

A range of international and domestic factors are currently resulting in rising costs for businesses and consumers. These factors include disruptions to global raw material supplies, higher oil prices, and pressure on shipping arrangements. These price pressures are likely to be temporary and are expected to abate over the course of the year.

The Committee noted that medium-term inflation and employment would likely remain below its *Remit* targets in the absence of prolonged monetary stimulus. The Committee also noted that while the low interest rate environment has supported house prices, other factors such as recent tax changes, the growing supply of housing, and lending restrictions, are providing offsetting pressures.

The Committee agreed to maintain its current stimulatory monetary settings until it is confident that consumer price inflation will be sustained near the 2 percent per annum target midpoint, and that employment is at its maximum sustainable level. Meeting these requirements will necessitate considerable time and patience.

Meitaki, thanks.

Adrian Orr
Governor

Summary record of meeting

The Monetary Policy Committee discussed economic developments since the February *Statement*, and their implications on the outlook for inflation and employment. The Committee noted the ongoing improvement in global economic activity and the associated rise in long-term wholesale interest rates. Fiscal and monetary stimulus are continuing to underpin the global recovery. However, the varied pace of national vaccination programmes, and the re-introduction of COVID-19 containment measures in some countries, means that the growth outlook remains uncertain, and uneven within and across countries.

Economic activity in New Zealand has returned to close to its pre-COVID-19 level. The increase in economic activity has been supported by ongoing favourable domestic health outcomes. This has led to a catch-up in consumer spending, supported by substantial monetary and fiscal stimulus. Improving global demand and higher prices for New Zealand's goods exports are also contributing to economic activity.

The Committee discussed the key factors underpinning the economic recovery and agreed that the outlook was unfolding broadly as outlined in the February *Statement*. The improvement in global and domestic economic indicators, such as New Zealand's terms of trade, have provided members more confidence in this outlook. However, the Committee agreed on the need for caution as domestic activity remains uneven across sectors of the economy.

The Committee noted areas of the economy where business activity levels remained low. The sectors most exposed to international tourism remain weak, despite the recent re-opening of travel with Australia. Business investment also remains below its pre-COVID-19 level, although recent indicators of investment intentions suggest signs of recovery.

The Committee noted that the level of employment has remained resilient. Reports of specific skill and seasonal worker shortages have the potential to put upward pressure on some wage costs. The economy is experiencing pockets of both labour shortages and employment slack, consistent with the economic disruption caused by COVID-19.

The Committee agreed that, in aggregate, the current level of employment remains below their estimates of the maximum sustainable level but expect it to converge to that level over time. They also expect to see wage growth lift as firms compete for labour, in particular given the current low levels of immigration.

The Committee noted that underlying CPI inflation currently remains slightly below their target midpoint of 2 percent per annum. A range of domestic and international factors are expected to lift headline inflation above 2 percent for a period. Members noted these factors are expected to be temporary and include higher international transport costs, disruptions to global raw material supplies and resulting higher prices for many commodities, and administrative charges.

The Committee discussed the risk that these one-off upward price pressures may promote a rise in more general inflation and inflation expectations. However, the Committee agreed that these risks to medium-term inflation were mitigated by ongoing global spare capacity and well-anchored inflation expectations.

The Committee assessed the effect of its monetary policy decisions on the Government's objective to support more sustainable house prices, as required by its *Remit*. It was noted that the current level of house prices results from a range of factors including low global and domestic interest rates, housing supply shortages, land use regulations, and strong investor demand.

However, the Committee acknowledged that some of the factors supporting house price growth have eased. In particular, they noted the current high rate of housing construction, historically low population growth, increased loan-to-value ratio restrictions, and the Government's recent changes to housing tax and supply policies. These factors place downward pressure on the longer-run level of sustainable house prices and are consistent with a period of significantly lower house price growth.

The Committee noted risks remain to economic growth both on the upside and downside. However, they expressed greater confidence in their outlook for the economy given the reduced risk of extreme downside shocks to the economy from COVID-19.

The Committee noted that on current projections the OCR eventually increases over the medium term, but agreed that this is conditional on the economic outlook evolving broadly as anticipated. In line with their least regrets framework, members reinforced their preference to maintain the current level of monetary stimulus until they were confident that the inflation and employment objectives would be met. They agreed this would require considerable time and patience.

The Committee discussed the effectiveness of monetary policy settings since the February *Statement*. The Committee noted staff advice that the LSAP programme has provided substantial monetary policy stimulus to date.

Staff noted that reduced government bond issuance was placing less upward pressure on New Zealand government bond yields. This also provided less scope for LSAP purchases with the limits outlined in the *Letter of Indemnity*, specified as a percentage of government bonds outstanding. Based on current Treasury projections for the issuance of New Zealand government bonds, the Committee acknowledged that the LSAP programme could not reach the $100bn limit by June 2022. Members affirmed that this dollar figure was a limit, not a target.

Members endorsed staff continuing to adjust weekly bond purchases as appropriate, in particular taking into account market functioning. The Committee agreed that weekly changes in the LSAP purchases do not represent a change in monetary policy stance, and that any desired change in stance would be made via the usual Monetary Policy Committee communication channel.

The Committee agreed that the OCR is the preferred tool to respond to future economic developments in either direction.

The Committee agreed to maintain its current stimulatory monetary settings until it is confident that consumer price inflation will be sustained near the 2 percent per annum target midpoint, and that employment is at its maximum sustainable level. The Committee agreed it will take time before these conditions are met.

On Wednesday 26 May, the Committee reached a consensus to:

- hold the OCR at 0.25 percent;
- maintain the existing LSAP programme; and
- maintain the existing Funding for Lending Programme (FLP) conditions.

Attendees:

Reserve Bank members of MPC: Adrian Orr, Geoff Bascand, Christian Hawkesby, Yuong Ha
External MPC members: Bob Buckle, Peter Harris, Caroline Saunders
Treasury Observer: Bryan Chapple
MPC Secretary: Sandeep Parekh

Chapter 2

Current economic assessment and key judgements

The Reserve Bank's Monetary Policy Committee (MPC) is responsible for using monetary policy to achieve and maintain medium-term price stability, and support maximum sustainable employment. These outcomes are the best long-run contribution that monetary policy can make to the prosperity and well-being of New Zealanders.

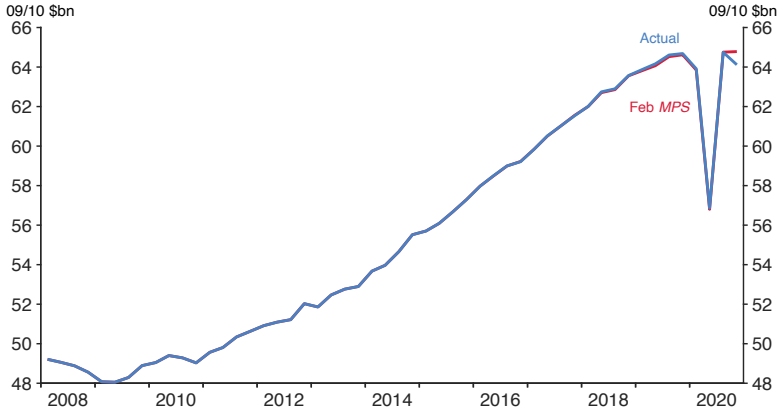
Key points

- The New Zealand economy continues to recover from the effects of the COVID-19 pandemic, but growth has been uneven across sectors. Housing-related sectors have fared better than those more exposed to the decline in international visitors since the border closed in March 2020. Global demand for our key export commodities has strengthened.
- General business sentiment has improved. Businesses are becoming increasingly confident to invest and hire more workers. Firms are also reporting higher costs and intend to increase their prices.
- The labour market remains resilient, with the unemployment rate having declined to 4.7 percent in the March 2021 quarter. Aggregate wage inflation has so far remained subdued, although labour shortages are constraining some sectors.
- Annual consumer price index (CPI) inflation increased to 1.5 percent in the March 2021 quarter, and is expected to increase temporarily in the near term. This reflects continued momentum in domestically-driven inflation overlaid with increases in the prices of tradable goods. The increase in tradables inflation is expected to ease later in 2021, with global supply-chain disruptions expected to have a transitory impact on inflation.
- The economic outlook is based on several key assumptions:
  - expectations for a stronger global recovery are realised;
  - supply-chain disruptions ease from the end of this year;
  - the trans-Tasman bubble is positive for economic growth, and New Zealand's border restrictions with other countries ease from the start of 2022;
  - government spending continues to support the economy; and
  - house price inflation slows.
- Given these key factors and the broader economic outlook, ongoing monetary stimulus is required. This will ensure that we can meet our inflation and employment objectives sustainably over the medium term.

The economy continues to recover

The New Zealand economy continues to recover from the effects of the COVID-19 pandemic. Although economic activity declined by 1 percent in the final quarter of 2020, this followed a sharp 13.9 percent rebound from New Zealand's period at Alert Level 4 (figure 2.1). Economic activity in New Zealand has benefited from a relatively low number of COVID-19 cases, with fewer and shorter-lived periods at higher restriction levels than many of our trading partners have experienced.

Figure 2.1
Quarterly production GDP
(seasonally adjusted)



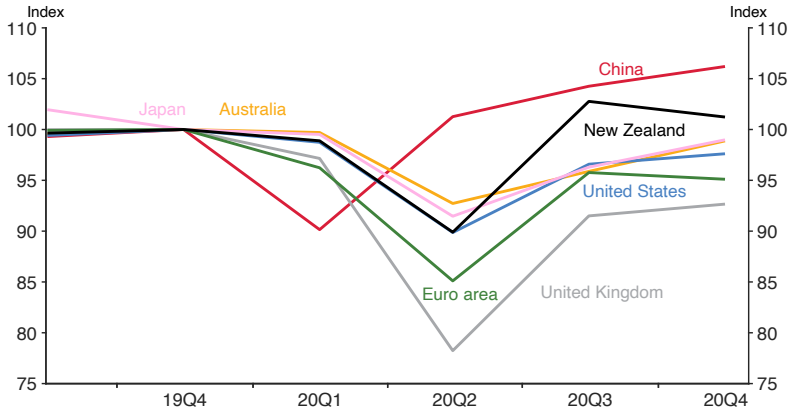
Source: Stats NZ, RBNZ estimates.

But growth has been uneven

While New Zealand's economic recovery has been stronger than many of our trading partners' recoveries (figure 2.2), it has been uneven across sectors. Housing-related sectors, such as construction and durable goods (e.g. appliances) retail, have fared better than those most exposed to international tourism (figure 2.3). The economy is assumed to have contracted further over the first three months of 2021 as the loss of international visitors continued to be felt by the tourism sector. However, the trans-Tasman bubble should provide some offset to this weakness over coming months.

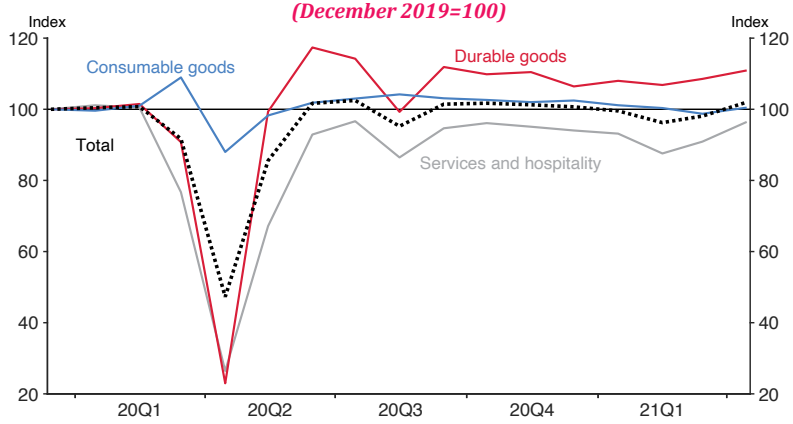
Demand for our goods exports has remained firm. The economic recovery in China has supported demand for New Zealand's export commodities, especially dairy products. Whole milk powder prices have increased 25 percent since the start of the year. Meat prices have remained stable in recent months and prices for logs have also increased. Strength in our export prices, low interest rates and higher capacity pressures in some sectors are consistent with early indications of rising business investment. One indication of increased investment is that imports of plant, machinery and transport goods have increased in recent months.

Figure 2.2
Economic recoveries in selected trading partners
(level of expenditure GDP indexed to 2019Q4, seasonally adjusted)



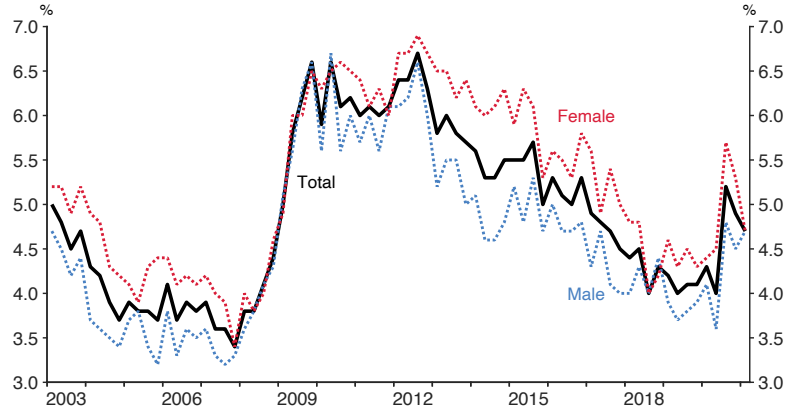
Source: Haver Analytics, Stats NZ.

Figure 2.3
Electronic card spending by sector
(December 2019=100)



Source: Stats NZ.

Figure 2.4
Unemployment rate by sex
(seasonally adjusted)



Source: Stats NZ.

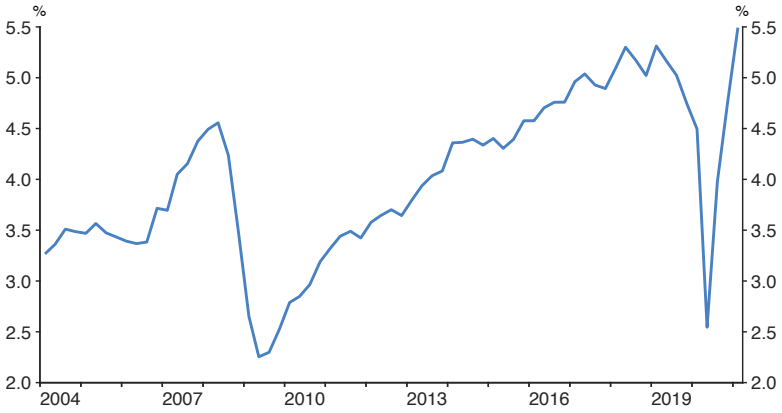
The labour market has been resilient

New Zealand's labour market has remained resilient. The unemployment rate fell to 4.7 percent in the March 2021 quarter. More people have also entered the labour market, and have generally been able to find work. The unemployment rates for men and women converged to 4.7 percent, driven mainly by a decline from 5.3 percent for women (figure 2.4). Sectors where women are a large part of the workforce were disproportiontely affected by the COVID-19 economic downturn. The improvement in the female unemployment rate is encouraging and indicative of a broader recovery in the labour market.

Labour demand is strong, with shortages emerging in some sectors

Survey measures and our discussions with businesses indicate that firms expect to hire more workers in coming quarters. Employment intentions in the *Quarterly Survey of Business Opinio*n (QSBO) have recovered in all surveyed industries. However, businesses report that the closed border is making it difficult to fill positions. These difficulties are particularly acute for skilled labour in the construction and IT sectors, as well as seasonal workers. The job vacancy rate has reached its highest level on record (figure 2.5), showing the strong demand for labour is not being fulfilled. Recent analysis of job-to-job flows by industry suggest that the movements of people from tourism-related sectors to other sectors, such as construction, is similar to pre-COVID-19 times. Businesses report that the skills in these different sectors are not always easily transferred.

Figure 2.5
Vacancy rate
(seasonally adjusted)



Source: ANZ, MBIE, Stats NZ, RBNZ estimates.

Note: The vacancy rate reflects the number of online job advertisements relative to the size of the labour force.

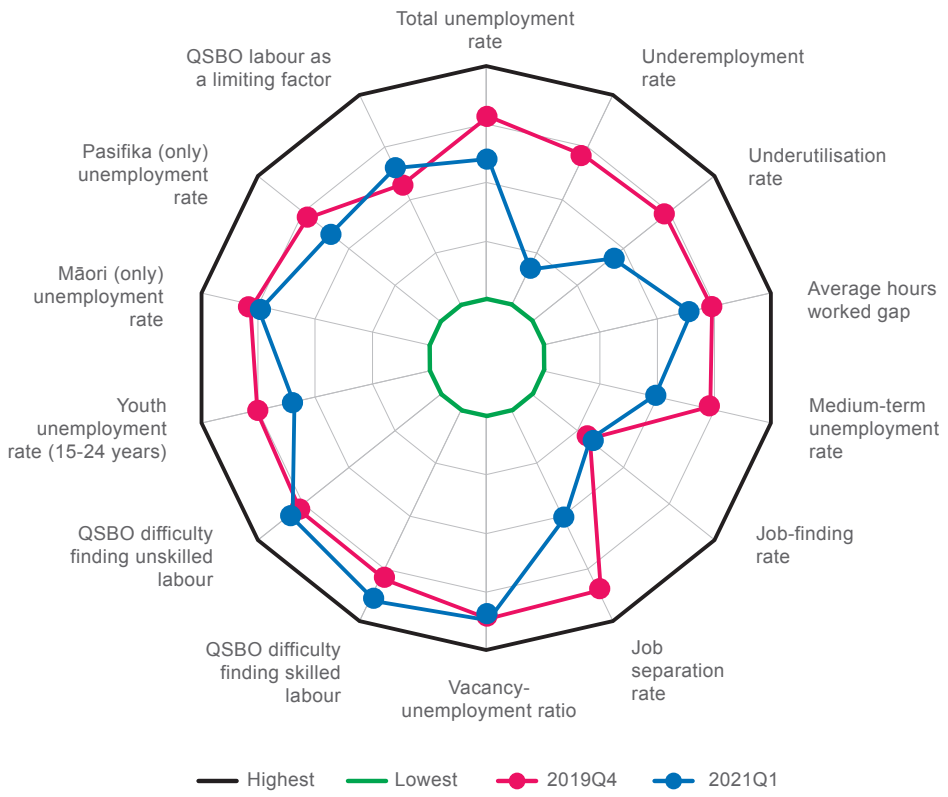
Employment is still below, but closer to, its maximum sustainable level

Although the latest labour market data have generally improved, measures of underutilisation and underemployment have increased. Our suite of labour market indicators suggests that while some sectors – particularly construction – are experiencing significant labour shortages, broader spare capacity remains (figure 2.6). While the Māori underutilisation rate has returned to near its pre-COVID-19 level, Pasifka unemployment and underutilisation remain elevated. We currently assess employment as being closer to but still below its maximum sustainable level.

Unlike the MPC's price stability target, maximum sustainable employment is not defined by a single number. The level of maximum sustainable employment can vary through time due to temporary or permanent structural changes in the economy. We believe that the level of maximum sustainable employment declined from the outset of the pandemic. The skills of those who lost their jobs in industries such as tourism are not necessarily well matched to sectors demanding more workers. Until demand returns in tourism-related industries, the level of employment that is sustainable without generating inflationary pressures is likely to be lower. It is unclear whether, or how quickly, maximum sustainable employment will return to its pre-COVID-19 level.

New Zealand's economic recovery and the fiscal suport provided through the Wage Subsidy scheme have kept more people in work than expected at the outset of the pandemic. This suggests that the extent of economic scarring that would have resulted from high and prolonged unemployment has been much lower. We will continue to examine job flows data for more information on how certain groups and skills within the working population have been redeployed since the outset of the pandemic.

Figure 2.6
Labour market tightness indicators



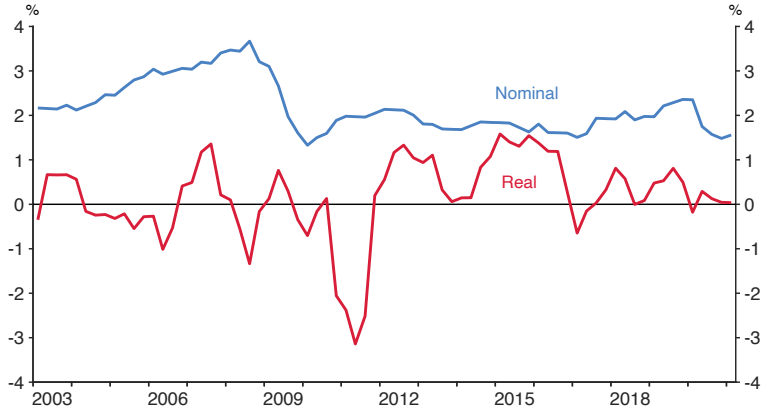
Source: Stats NZ, MBIE, NZIER, RBNZ estimates.

Note: The black ring indicates the highest utilisation of labour, while the green ring shows the lowest level since the March 2000 quarter. The black ring should not be taken as being consistent with maximum sustainable employment, but as an overheated labour market. As we continue to learn more about the labour market and these measures we will develop a better sense of where maximum sustainable employment lies. The red line indicates where these measures were in 2019Q4, a time when we judged employment to be near its maximum sustainable level.

But wage growth remains relatively subdued

Despite strong labour demand and skill shortages in some areas, wage growth remains subdued. Annual labour cost index (LCI) wage inflation was only 1.6 percent for the private sector in the March 2021 quarter. This included the increase in the minimum wage from 1 April 2020, and implies that wages grew broadly in line with consumer price inflation (figure 2.7). We expect wage growth to strengthen over the next year, as labour market shortages continue and another increase in the minimum wage from 1 April 2021 is captured in the data.

Figure 2.7
Private sector LCI wage inflation
(annual)



Source: Stats NZ.

Note: The LCI aims to remove the effects of changes in labour market composition and productivity.

Inflation has increased

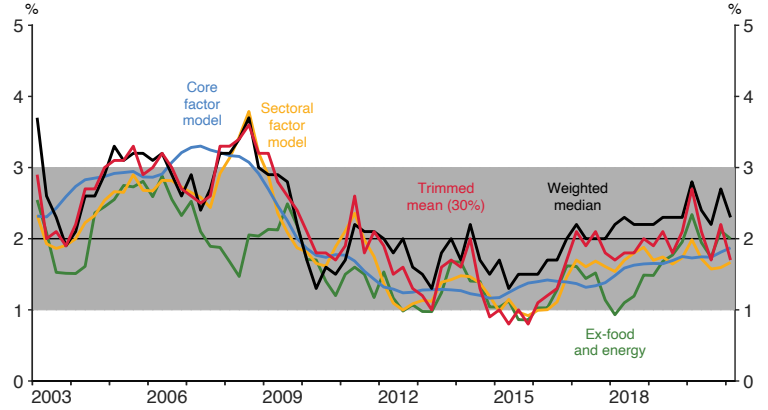
Annual CPI inflation rose to 1.5 percent in the March 2021 quarter. With overall demand holding up and the labour market continuing to recover, many firms are facing rising capacity pressures. Commodity prices have also rebounded. Measures of core inflation have continued to trend gradually higher towards the mid-point of the MPC's 1 to 3 percent target range, while medium- and long-term inflation expectations remain anchored near 2 percent (figures 2.8 and 2.9).

Inflation is expected to increase temporarily in the near term

Inflation is expected to increase into the top half of the MPC's target range during 2021. This near-term increase is due to a lift in non-tradables inflation – underpinned by rising prices due to strength in the construction and housing sectors – overlaid with an increase in tradables inflation (figure 2.10).

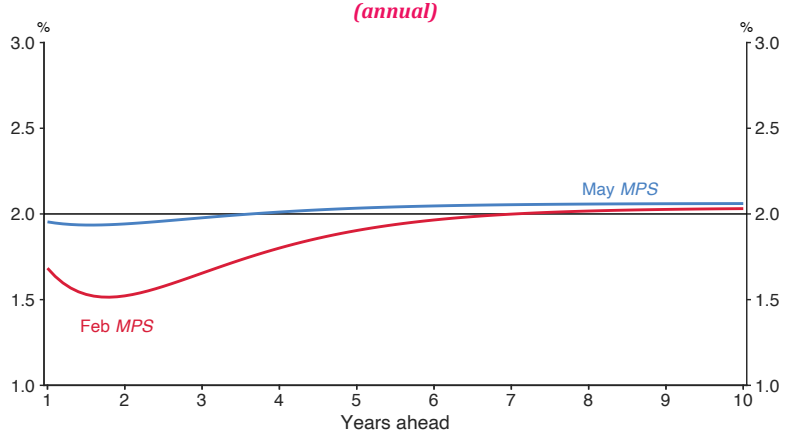
Annual tradables inflation is expected to increase in the short term, predominantly reflecting the rebound in oil prices. We also expect supply-chain disruptions to have a temporary impact on tradables inflation (see chapter 4). The increase in the New Zealand dollar provides a partial offset. The New Zealand dollar measured against a trade-weighted basket of other currencies has appreciated in recent months, and is assumed to remain at its current level.

Figure 2.8
Measures of core inflation
(annual)



Source: Stats NZ, RBNZ estimates.

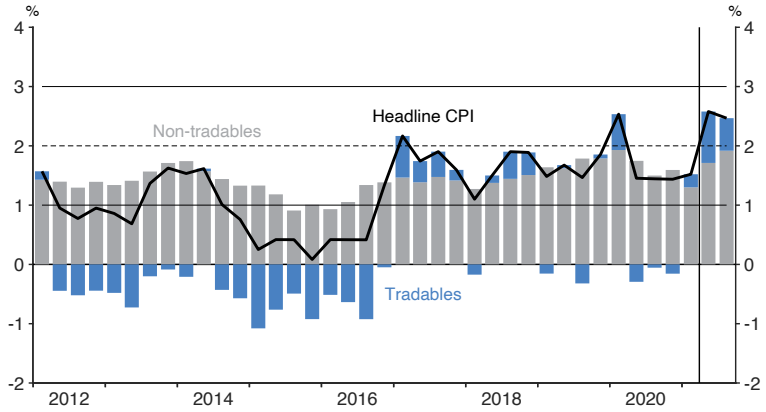
Figure 2.9
Inflation expectations
(annual)



Source: RBNZ estimates.

Note: See Inflation expectations and the conduct of monetary policy in New Zealand (Lewis, McDermott and Richardson, 2016) for a description of the inflation curve.

Figure 2.10
Contributions from non-tradables and tradables inflation
(annual)



Source: Stats NZ, RBNZ estimates.

Key judgements

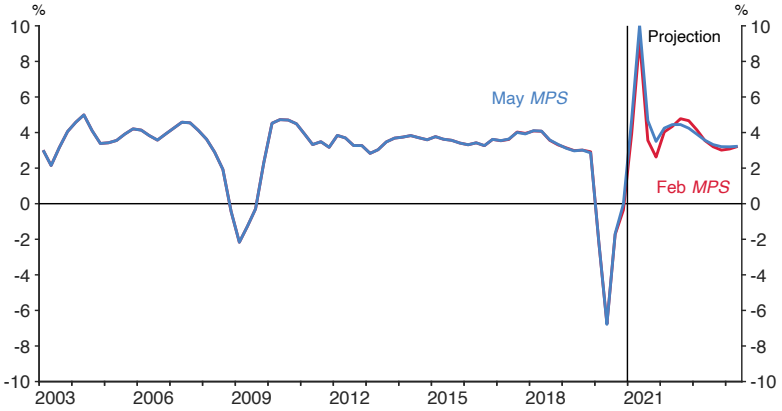
The key factors underpinning our economic outlook are outlined below. Chapter 5 discusses our remaining assumptions.

Expectations for a stronger global recovery are realised

International forecasts for global growth have been revised higher over recent months (figure 2.11). Global bond yields have also increased since the start of the year, on expectations for stronger economic activity and higher inflation. We assume the improved outlook translates into stronger demand for our export goods, and is reflected in continued strength in our terms of trade.

The high terms of trade, in conjunction with low interest rates and increasing capacity pressure in some sectors of the economy, are expected to give businesses confidence to invest and hire more workers.

Figure 2.11
Trading-partner GDP growth
(annual)



Source: Consensus Economics, RBNZ estimates.

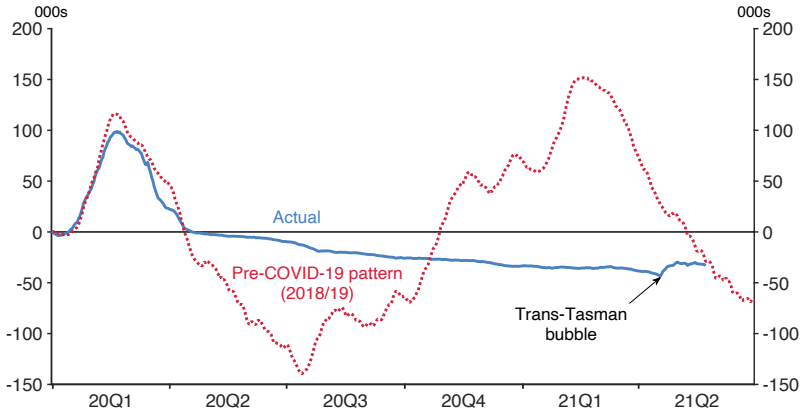
The outlook for the global economy is highly uncertain, and dependent to a large extent on the progress and effectiveness of vaccination programmes. On the upside, there are early indications that inflation in some of our trading partners, such as the United States, is picking up faster than expected, which would push up headline CPI inflation in New Zealand. On the downside, the long-term scarring effects of the pandemic on the global economy are unknown.

Supply-chain disruptions ease from the end of this year

Recovering global demand and health-related restrictions have stretched supply chains since mid-2020. We assume supply-chain disruptions will ease materially from the end of this year, and that affected prices will largely normalise (see chapter 4).

New Zealand's flexible inflation targeting framework means that the MPC looks through any temporary movements in inflation, and focuses instead on the medium term. There is some risk that supply-chain disruptions last longer and affected prices remain high. This would be a concern to monetary policy only if it led to a general increase in inflation expectations that was inconsistent with the MPC's inflation target (see box A).

Figure 2.12
Net New Zealand border crossings
(cumulative, all countries)

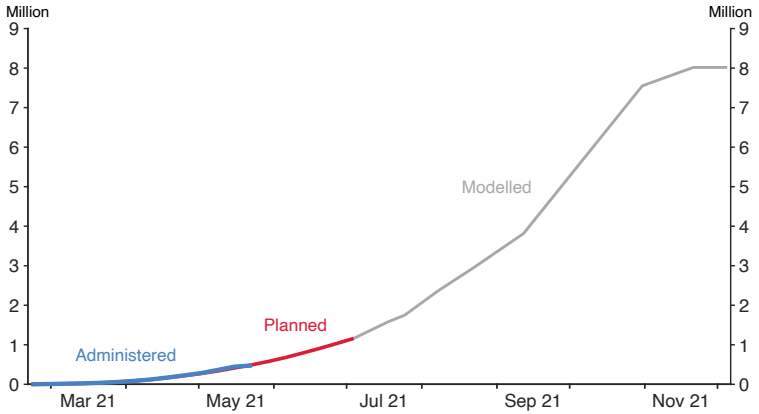


Source: New Zealand Customs Service, RBNZ estimates.

The trans-Tasman bubble and easing border restrictions support economic growth

While the trans-Tasman bubble will result in more visitors from Australia, more New Zealand residents are also expected to travel to and spend in Australia instead of within New Zealand. On balance, we assume that spending by Australian visitors will more than offset the loss in domestic spending, but the magnitude of this is highly uncertain. Since the travel bubble took effect, there has been a net increase of arrivals to New Zealand. However, this has so far been small relative to our usual seasonal flows (figure 2.12).

Figure 2.13
COVID-19 vaccines administered in New Zealand



Source: Ministry of Health.

Note: Modelled vaccinations from the Ministry of Health exceed New Zealand's adult population, as more than one dose per person is required.

We assume that New Zealand's COVID-19 vaccination programme runs as planned by the Ministry of Health (figure 2.13), and that sufficient herd immunity is achieved in New Zealand to accommodate a material easing of border restrictions from the start of 2022. We expect a gradual recovery in international visitors over subsequent years.

Government spending continues to support the economy

Fiscal stimulus, especially the Wage Subsidy scheme, has provided significant support to the economy since the outset of the pandemic. We do not assume any further COVID-19 outbreaks requiring stimulus of this nature. However, we expect fiscal policy to remain accommodative for several years, consistent with the recently released *Budget 2021*. In particular, we expect the recent changes to welfare policy to increase spending in the economy, as higher transfers are going to those with lower incomes who are more likely to spend the additional payments.

House price inflation eases

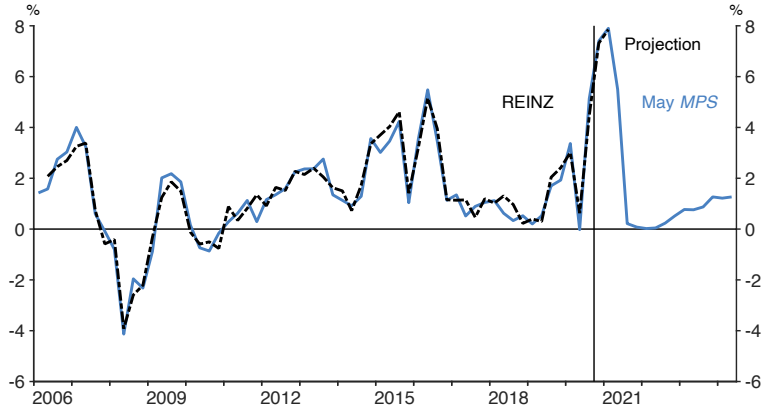
As in the February *Statement*, house price inflation is assumed to ease due to:

- slower population growth via low immigration over most of 2020 and 2021;
- the reintroduction and tightening of loan-to-value ratio (LVR) restrictions;
- the waning impact of interest rate declines over 2019 and 2020; and
- increased supply from strong residential construction.

Chapter 4 provides more discussion of the impact of low interest rates on house price sustainability.

On 23 March, the Government announced a range of changes to tax and housing policy. These are aimed at supporting more sustainable house prices, including by dampening investor demand for existing houses, to improve affordability for first-home buyers. In conjunction with the existing factors listed above, the Government's policy changes are expected to see house price inflation ease to nearly zero percent in quarterly terms from the middle of this year (figure 2.14).

Figure 2.14
House price inflation
(quarterly, seasonally adjusted)



Source: Corelogic, REINZ, RBNZ estimates.

Figure 2.15
Unemployment rate
(seasonally adjusted)

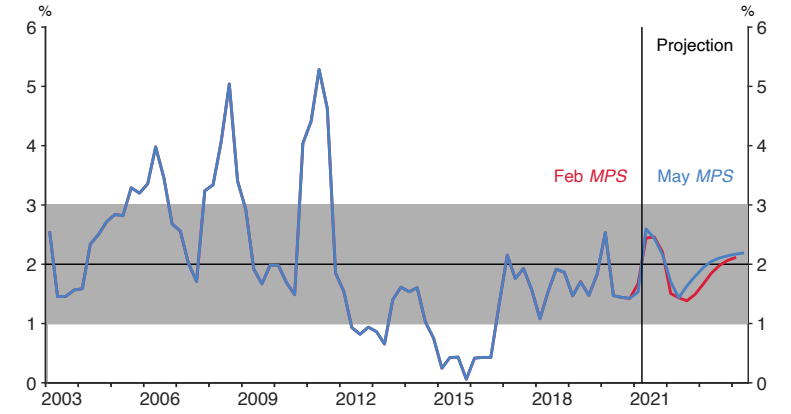
Source: Stats NZ, RBNZ estimates.

Continued monetary stimulus remains necessary

Given these key judgements and the broader economic outlook, continued monetary stimulus remains necessary to ensure that the domestic recovery is sustained and we meet our inflation and employment objectives over the medium term (figures 2.15 and 2.16).

In March 2020, the MPC announced that the Official Cash Rate (OCR) would remain at 0.25 percent for at least 12 months. This provided households and firms with certainty that monetary policy would continue to be accommodative. At the time, operational constraints in the financial system limited the MPC's ability to deliver more stimulus through a negative OCR. However, scenarios presented during 2020 indicated that more stimulus was necessary, and other monetary policy instruments were introduced (discussed further in chapter 3). To capture this broader degree of required stimulus, we began publishing an 'unconstrained OCR' from the May 2020 *Statement*.

Figure 2.16
CPI inflation
(annual)

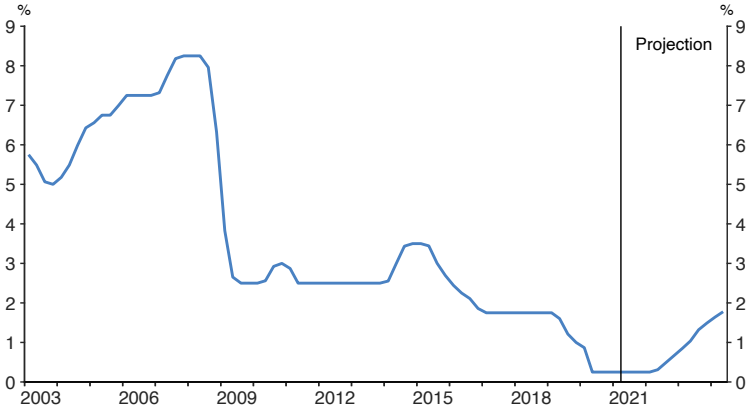


Source: Stats NZ, RBNZ estimates.

Now that operational constraints have been addressed and the OCR can be lowered further if necessary, we believe it is appropriate to return to our long-standing practice of publishing an OCR projection (figure 2.17). This projection is *conditional*, in that it communicates the policy path required to meet our monetary policy objectives subject to the economic outlook and the assumed impacts of other monetary policy tools. Future changes in the economic outlook should be reflected in shifts in the OCR projection.

There continues to be more stimulus provided than captured in the OCR projection. This reflects the ongoing stimulus from the Large Scale Asset Purchase (LSAP) programme and the Funding for Lending Programme (FLP). However, monetary conditions have tightened since the February *Statement*, due to higher international and domestic long-term interest rates. The current economic outlook implies that continued monetary stimulus remains necessary to meet our inflation and employment objectives sustainably over the medium term.

Figure 2.17
OCR



Source: RBNZ estimates.

Box A

Monetary policy's response to temporary and persistent price changes

Recent supply-chain disruptions are expected to increase inflation temporarily in the near term. The monetary policy **Remit** directs the MPC to "*discount events that have only transitory effects on inflation, setting policy with a medium-term orientation*". This is because attempts to offset temporary changes in inflation with monetary policy would result in greater volatility in output and employment. It is also challenging for monetary policy to offset unexpected changes in near-term inflation, as interest rates take time to affect the economy.

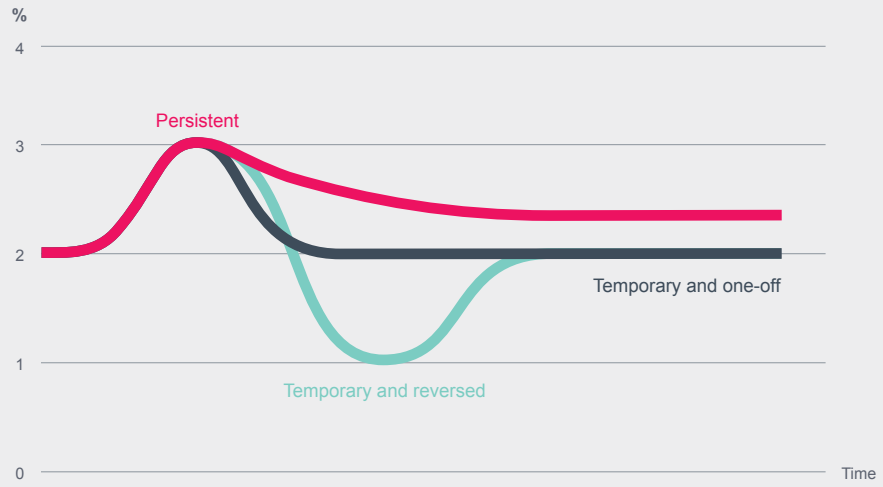
However, it is difficult at any point in time to judge whether developments in inflation are likely to be temporary or persistent. This difficulty can be due to uncertainty about the persistence of the underlying driver (such as the outlook for oil prices), or uncertainty about how households and businesses might adjust their expectations of inflation into the future.

For example, if households and businesses *perceive* an increase in inflation to be persistent, they are likely to respond by asking for higher wages to compensate for a higher cost of living or by setting higher prices. This can become self-fulfilling, as higher actual wages and prices can lead to higher expectations for future inflation. It is for this reason that central banks place so much emphasis on measures of inflation expectations. These measures help assess the perceived persistence of inflation changes and whether they are consistent with central banks' inflation targets.

As illustrated in figure A1, changes in inflation can broadly be characterised as:

1. temporary changes in prices that fully reverse (for example, an increase in global oil prices followed by a decline of the same magnitude);
2. one-off changes in prices that do not reverse, but do not place ongoing pressure on inflation (for example, the increase in the rate of GST in 2010); and
3. changes in prices that affect expectations of future prices, and result in ongoing inflationary pressure.

Figure A1
Stylised representation of changes in annual inflation



The current pressure on supply chains is assumed to result in a temporary change in prices that at least partially reverses as conditions normalise. However, there is some risk that the change in prices is more persistent and leads to ongoing inflationary pressure. Consistent with the *Remit*, the MPC would be expected to respond to ongoing inflationary pressure if it were perceived as being inconsistent with the inflation target.

Chapter 3
Monetary policy instruments

During 2020 the MPC cut the OCR to a record low level of 0.25 percent, and introduced additional monetary policy (AMP) tools to support New Zealand's economy through the COVID-19 pandemic. These actions were summarised in the **February 2021 *Statement***.

These actions influence economic activity through several key financial market channels. These include:

- the interest rate channel;
- the portfolio rebalancing channel;
- the exchange rate channel;
- the market functioning channel; and
- the bank lending channel.

This chapter examines how effectively these channels have operated, and discusses the outlook for AMP tools as the economy continues its recovery.

Key financial market channels of monetary policy

Interest rate channel

Interest rates are the main way conventional monetary policy affects the economy. By raising or lowering the OCR, the Reserve Bank influences key wholesale interest rates, which in turn influence interest rates faced by households and businesses. Because the OCR is an overnight interest rate, it has its largest influence on shorter-term interest rates. However, longer-term interest rates also embed expectations about the future level of the OCR.

AMP tools also influence interest rates, but typically at longer terms than the OCR. Under the Large Scale Asset Purchase (LSAP) programme, the Reserve Bank has bought government bonds of maturities up to 20 years on the secondary market (i.e. not directly from the government). Purchasing large quantities of these bonds raises their price, lowering their yield. The yields on government bonds are key benchmark interest rates in the economy. By lowering these yields the Reserve Bank can exert downward pressure on other interest rates at longer maturities. These include the interest rates local governments and corporates pay to raise debt in the bond market.

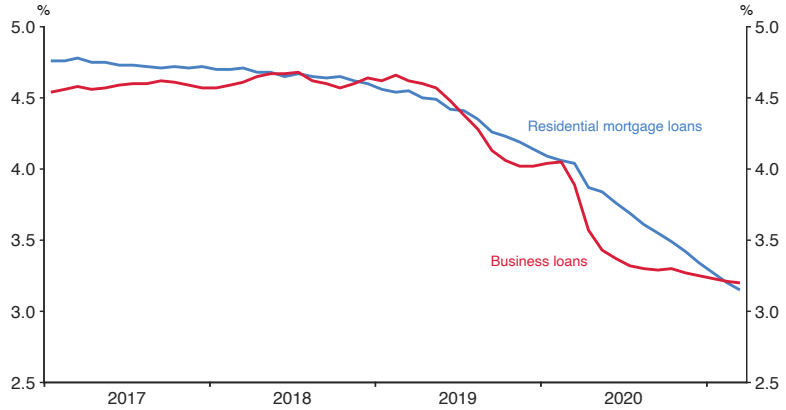
LSAPs also help to keep longer-term interest rates lower than otherwise via a 'signalling effect'. This is because market participants might interpret LSAPs as evidence that monetary policy will need to be accommodative for an extended period in order for the MPC to meet its objectives. Central banks can also use more explicit 'forward guidance' and commit to future paths for their official interest rates. For example, in March 2020 the MPC committed to holding the level of the OCR at 0.25 percent for at least 12 months. This anchored short-term interest rates around the level of the OCR.

The Funding for Lending Programme (FLP) provides banks with funding at the prevailing level of the OCR for three years. As a source of stable and low-cost funding this tool can directly lower bank funding costs. It also indirectly lowers bank funding costs by making other sources of funding, such as deposits or bonds, relatively less attractive, which puts downward pressure on the cost of these funding sources. With a lower cost of funding, banks are able to offer lower lending rates to their customers.

Interest rates impact the broader economy through three main sub-channels: the *cash-flow channel*, the *inter-temporal substitution channel*, and the *asset price channel*.

The *cash-flow channel* works by lowering the interest burden for borrowers in the economy. A lower interest rate makes debt cheaper to service. This leaves borrowers with more disposable income, boosting demand in the economy.

Figure 3.1
Average lending interest rates



Source: RBNZ.

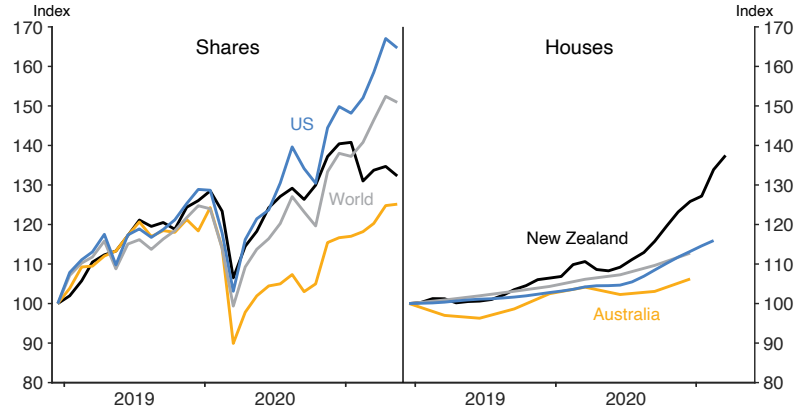
Note: The average interest rate refers to the yields on loans.

In the year to March 2021, the average interest rate on outstanding bank residential mortgage loans fell by 0.9 percentage points (figure 3.1). This equates to a reduction in mortgage interest payments of about $2.5 billion. Over the same period, the yield on business loans fell by 0.7 percentage points.

The *cash-flow channel* also reduces the interest earned by savers. This impact is smaller as New Zealanders' interest-bearing assets are smaller than their interest-bearing liabilities. As a result, the cash-flow channel is positive overall.

Through the *inter-temporal substitution channel*, lower interest rates encourage households and businesses to spend more now rather than in the future. This raises aggregate demand and helps to support employment and inflation.

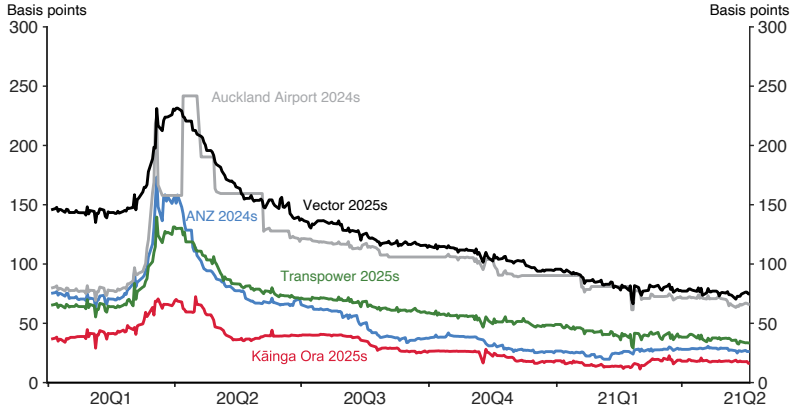
Figure 3.2
International asset prices
(December 2018 = 100)



Source: S&P, Australian Bureau of Statistics, REINZ, OECD, Haver Analytics.

Note: Share prices are capital indices. House prices for OECD members serve as a proxy for world prices.

Figure 3.3
Credit spreads



Source: Bloomberg, RBNZ.

Note: Credit spreads are the spread in basis points between secondary market bond yields and the swap curve. A lower spread represents a lower implied borrowing cost. The year in the legend entries refers to the year the bond matures.

The *asset price channel* refers to how asset prices move in response to changes in interest rates. When returns on interest-bearing assets decline, households and firms tend to be willing to pay more for assets that provide income in the future (such as equities and property). This is because the returns on these assets become relatively more attractive. Asset prices have risen worldwide over the past year, partially in response to lower interest rates since the outset of the COVID-19 pandemic (figure 3.2).

Higher asset prices can contribute to stronger household and business spending. Households may feel wealthier when their assets appreciate in value, and increase their spending. Households and businesses may also spend and invest more as rising asset values increase their borrowing capacity. Higher prices and demand for physical assets that provide long-term benefits – such as capital goods and residential and commercial property – may increase demand in the sectors that produce them.

Portfolio rebalancing channel

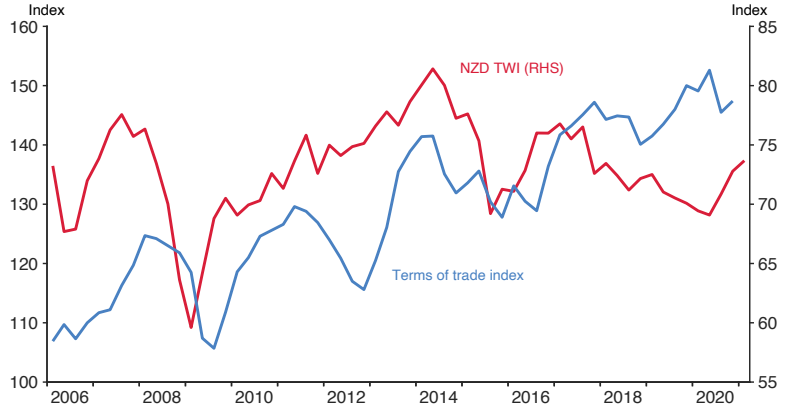
This channel is related to the asset price channel and is one of the main channels for the transmission of the LSAP programme. Because the LSAP programme acts to lower the yields on government bonds, investors may seek higher yields by purchasing riskier assets, such as shares or corporate bonds (figure 3.3). This in turn makes it cheaper for businesses to raise money through these securities, helping to support growth and investment.

Exchange rate channel

Conventional monetary policy influences the exchange rate by changing the relative level of interest rates between countries, thereby driving demand to hold one currency over another. Our current AMP tools also affect the exchange rate, by influencing relative levels of longer-term interest rates and through the portfolio rebalancing channel. For example, by lowering the expected return across a broad range of New Zealand dollar-denominated assets, the LSAP programme encourages investors to seek higher returns in assets denominated in other currencies. This reduces demand for New Zealand dollars, putting downward pressure on the exchange rate.

A lower exchange rate supports inflation and employment by boosting export revenue, and by increasing import prices and encouraging consumers to switch to domestic products. A variety of factors currently supports the exchange rate, including New Zealand's relatively strong economic performance and high prices for New Zealand's key export commodities. However, the exchange rate is lower than it would otherwise be as a result of our monetary easing. As an example, New Zealand's terms of trade (the price of exports relative to imports) is close to a record high, while the New Zealand dollar measured against a basket of trading-partner currencies is close to its 10-year average (figure 3.4).

Figure 3.4
The New Zealand dollar trade-weighted index (TWI) and the terms of trade



Source: Stats NZ, RBNZ.

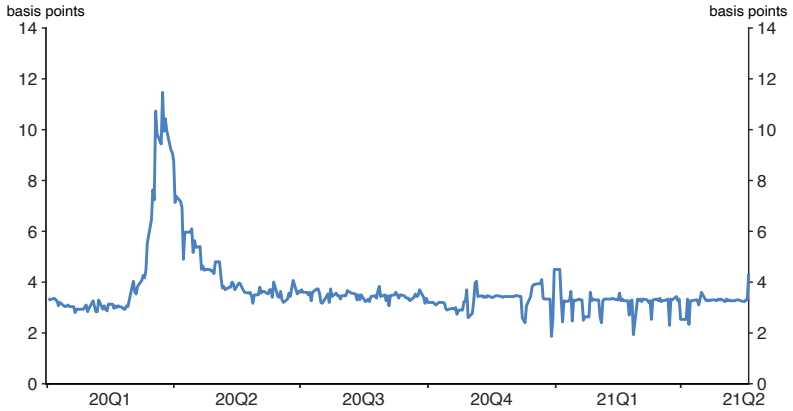
Note: The NZD TWI is the quarterly average.

Market functioning channel

AMP tools can support market functioning by providing a source of liquidity in markets during periods of stress when other participants may be unwilling to trade. In these situations, the transmission of monetary policy is impeded. By restoring the functioning of financial markets, AMP tools can support the effectiveness of other transmission channels.

One indicator of financial market functioning is the bid-ask spread. This measures how far apart buyers and sellers are from reaching an agreed price to trade. In times of market stress, bid-ask spreads can widen significantly. By this measure, the LSAP programme was effective in easing market dysfunction in the government bond market in March and April 2020 when uncertainty related to COVID-19 was extremely high (figure 3.5). After the launch of the LSAP programme, bid-ask spreads on government bonds contracted and returned to pre-COVID-19 levels by May 2020.

Figure 3.5
Average bid-ask spread on nominal New Zealand government bonds



Source: Bloomberg, RBNZ.

Bank lending channel

The level of bank lending is influenced by several factors. One of the most important is interest rates, as these influence demand for credit. AMP tools may also influence the volume of bank lending by increasing liquidity in the banking system.

Internationally, there is mixed evidence about the strength of the bank lending channel in the transmission of LSAPs to the economy. This may be because liquidity is usually not the binding constraint on bank lending. At various times, other constraints such as the availability of profitable lending opportunities, bank risk appetite and prudential regulations may play greater roles in influencing the quantity of bank lending.

The FLP has a more direct effect through the bank lending channel given that it includes a specific incentive to increase bank lending (see the November 2020 *Statement*). The FLP can also act as a funding 'back-stop' during times of financial market stress, meaning that banks can continue to lend in confidence given that they have the FLP as a funding source.

Outlook for monetary policy instruments

The LSAP programme was launched in March 2020. The maximum programme size has been expanded several times, most recently to $100 billion in August 2020. To ensure that a sufficiently deep and liquid market for New Zealand government bonds remains, the Reserve Bank has agreed to keep purchases within a specified proportion of outstanding bonds, in respective markets. This is important for both market functioning and monetary policy transmission.

Since the August 2020 decision, the actual and projected issuance of government bonds has declined. Therefore it is no longer possible for the total LSAP programme size to reach $100 billion by the June 2022 end date of the programme.

The rate of purchases under the LSAP programme has reduced substantially since the scheme was launched. However, the stock of bonds purchased continues to increase. These bond holdings will provide ongoing stimulus after purchases cease.

The FLP became operational in December 2020 and is open for drawdowns under the initial allocation until June 2022. Drawdowns under the additional allocation, which require growth in bank lending as a prerequisite, are available for an additional six months to December 2022. Since the term of the FLP drawdowns is three years, this means that some of the low-cost funding provided by the FLP could be on bank balance sheets until 2025, directly reducing the cost of bank funding. The indirect benefits of the FLP will continue to exist until the end of the drawdown periods as the FLP provides a lower-cost alternative to other funding sources.

In addition to the tools deployed in 2020, which will continue to provide stimulus for several years, the Reserve Bank has other tools it can deploy should additional monetary stimulus be needed. One of these is further cuts to the OCR, including to below zero.

If further stimulus is required, a lower OCR is currently the preferred tool to deliver it (although the MPC would consider the circumstances at the time, and its **principles for AMP instrument decision making**). A lower OCR would likely be more effective and efficient than scaling up the LSAP programme or the FLP in current circumstances, particularly due to the constraints on bond purchases discussed earlier. Using the OCR as a policy tool has the additional advantage that it can be deployed quickly in response to conditions in the economy. Equally it can be unwound quickly if required.

Chapter 4
Special topics

Prior to each *Statement*, the MPC is provided with analysis of some topical issues.

Topics for the May *Statement* included:

1. disruptions to global and domestic supply chains; and
2. monetary policy and house price sustainability.

1. Disruptions to global and domestic supply chains

The COVID-19 pandemic has constrained the global economy's ability to supply goods and services, including to and from New Zealand. There has also been a widespread increase in global demand for goods because of pent-up demand from previous lock-downs worldwide, and a global shift in consumer spending towards goods and away from services.

These developments are affecting New Zealand households and firms, as they rely on imported goods. The border closure since March 2020 has also limited the number of workers coming here. These disruptions to the usual flow of both goods and workers are likely to result in greater capacity constraints and inflationary pressures in the New Zealand economy.

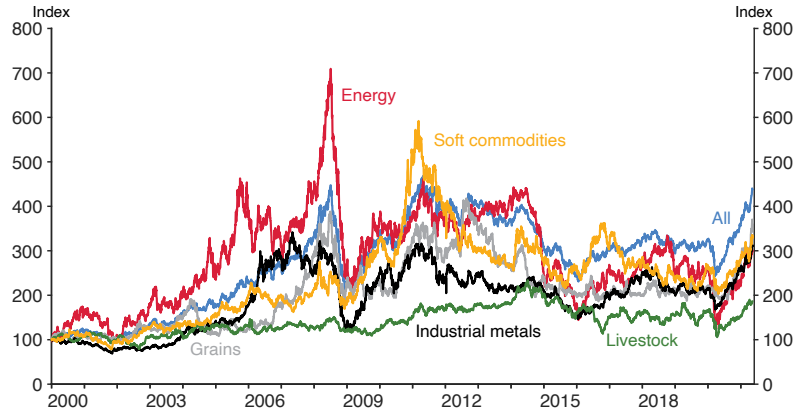
Supply pressures are increasing costs for firms

Global supply chains have struggled to keep up with demand since the outbreak of COVID-19. This partially reflects a global shift in consumer spending towards goods because the pandemic has made it harder to spend on some services. Demand for goods has been boosted further as firms around the world have sought to restock depleted inventories. Some firms have also brought forward purchases in anticipation of further disruptions. This strong increase in demand has lifted prices for key commodities (figure 4.1), pushing up production costs.

Supply chains have also been disrupted. Pandemic restrictions have meant some firms have not been able to produce as much as usual. Restrictions have also limited the availability of workers and how productively they can work. Transport networks have been disrupted as the pattern of global shipping flows has changed. Fewer passenger flights have also meant reduced air freight capacity. The blockage of the Suez Canal in March further contributed to delays in moving goods around the world. Combined with strong demand, these factors have created congestion and delays at key ports globally and have significantly increased global shipping costs.

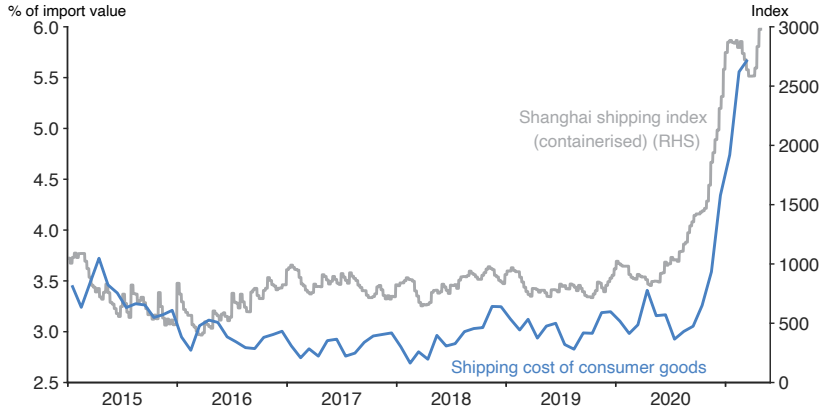
New Zealand firms have faced increased prices for imported goods because of these supply-chain bottlenecks. Domestically, some of New Zealand's ports have found it difficult to keep up with shipping volumes. This has put pressure on road and rail transport networks as freight has been redirected from other ports by land. The cost of shipping goods to and from New Zealand has increased significantly, particularly for container-based freight, which includes many consumer goods (figure 4.2).

Figure 4.1
Bloomberg commodity price index



Source: Bloomberg.

Figure 4.2
Measures of sea shipping costs



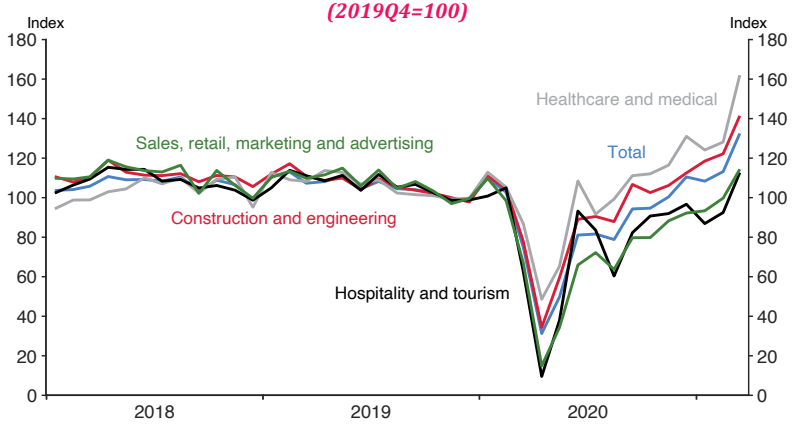
Source: Bloomberg, Stats NZ, RBNZ estimates.
Note: The blue line is calculated by taking the value of consumer merchandise imports including freight and insurance costs (CIF) and subtracting the value reported for duty (VFD), which excludes these costs. It is expressed as a percentage of the VFD figure.

In addition to higher import prices, firms are reporting delays in getting goods into New Zealand. In some cases firms' global suppliers are facing difficulty filling orders. This means some firms may not be able to produce goods as usual due to shortages of key inputs such as chemicals, parts and other materials. In the retail sector, difficulties in getting new stock from overseas have discouraged promotional discounting in some instances.

Labour shortages add to supply-chain difficulties

Many New Zealand firms are also having difficulty hiring workers. Although there has been a fall in demand for staff in some service-related industries such as tourism, workers who have lost their jobs do not always have the right skills to transfer to other sectors where demand is high. While unemployment remains above its pre-COVID-19 levels, demand for labour has increased significantly in some industries, such as construction (figure 4.3). Firms' labour shortages have been more significant due to border restrictions that have limited their access to workers from overseas. These impacts have been felt strongly by industries that rely on seasonal migrant labour, such as horticulture.

Figure 4.3
Job advertisements
(2019Q4=100)



Source: MBIE.

In some sectors, notably construction, labour shortages are creating significant competition for employees. Our business contacts report competitors more frequently enticing staff with attractive pay offers, and firms making counter-offers to retain staff. To date these pressures have not translated to significant economy-wide wage growth, with the labour cost index (LCI) for the private sector growing by 0.4 percent in the March 2021 quarter. However, we expect ongoing labour market tightness to gradually increase wage inflation over the next few years.

Supply challenges expected to temporarily increase inflation

We expect higher costs from supply-chain disruptions and labour shortages to result in a rise in consumer price inflation as firms at least partially pass on higher costs. These impacts are expected to principally come through in higher imported (tradables) inflation over 2021 (see figure 5.1), including a sharp increase in petrol prices.

However, we expect the broader impact on consumer price inflation to be moderate and temporary. Our projection assumes that goods supply-chain bottlenecks begin to ease in late 2021, and dissipate gradually over 2022. There are already tentative signs that the strong global demand for goods is abating, as easing of public health restrictions abroad is lifting demand for services such as eating out and travel. In addition, we expect labour shortages will lessen as border restrictions ease and more workers are able to come into New Zealand.

Medium-term inflation expectations remain anchored near 2 percent despite recent supply-chain bottlenecks (see figure 6.7). This suggests that the near-term acceleration in cost and price pressures is currently not widely expected to spill over into more generalised and persistent inflation. The persistence of the current disruptions to the supply of goods and labour remains uncertain.

2. Monetary policy and house price sustainability

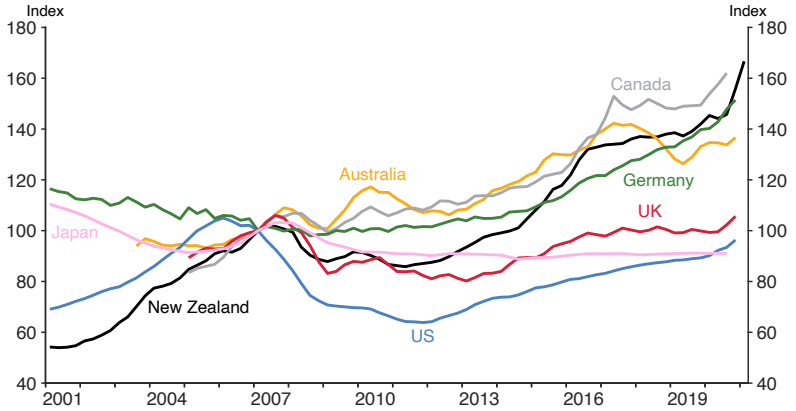
On 1 March the *Remit* for the MPC was changed. The MPC is now required to assess the effects of its monetary policy decisions on the Government's objective to support more sustainable house prices. The MPC's economic objectives remain unchanged – that is, to maintain stability in consumer price inflation and contribute to maximum sustainable employment. The Minister of Finance also directed the Reserve Bank to have regard to the Government's housing policy when making its financial stability policy decisions (see the May 2021 *Financial Stability Report*).

The Reserve Bank's working definition of a sustainable house price is the level that the price would be expected to move towards, given the outlook for the factors that determine the supply of and demand for houses. Deviations of house prices from their sustainable levels can have important implications for the economy and can pose a threat to financial stability.

Structural factors explain high house prices in New Zealand

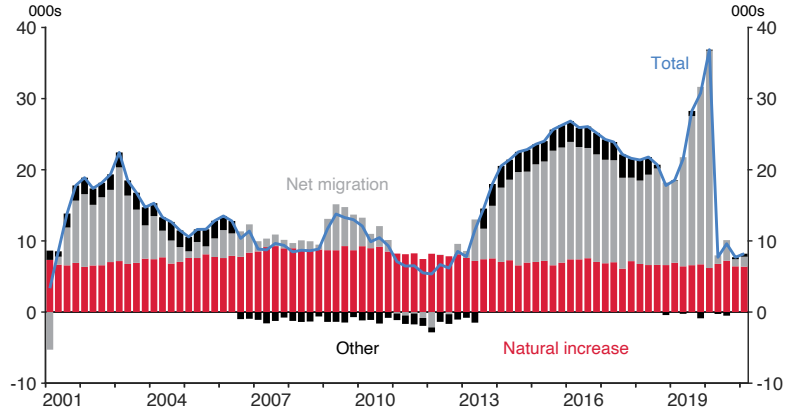
In New Zealand and many other countries, house prices have risen significantly over the past two decades (figure 4.4). High house prices and rents in New Zealand largely reflect structural and regulatory issues in New Zealand's housing market. Policy constraints, such as urban planning rules and other land use restrictions, have meant that the supply of houses has been slow to respond to increasing demand (see chapter 4 of the November 2020 *Statement*). The underlying demand for houses has increased as New Zealand's population has grown – by 750,000 people over the past decade. New Zealand's population increased rapidly during the period of high net immigration between 2013 and early 2020 (figure 4.5).

Figure 4.4
Real house prices
(2007Q1=100)



Source: Bank for International Settlements, REINZ, RBNZ estimates.
Note: Real house prices are house prices adjusted for consumer price inflation. This makes the data more comparable across countries.

Figure 4.5
Quarterly population growth



Source: Stats NZ, RBNZ estimates.
Note: Components are seasonally adjusted by the Reserve Bank until the March 2020 quarter. 'Other' captures technical adjustments to reconcile the data with censuses, and seasonal balancing adjustments. 'Natural increase' refers to the change in population due to births and deaths.

Declines in interest rates have also lifted house prices

Declining interest rates have also contributed to rising house prices. When interest rates fall, both owner-occupiers and investors are willing and can afford to pay more for a house. Lower interest rates make mortgages cheaper and buying a house, to live in or invest in, more attractive relative to investments such as bank deposits. Interest rates can therefore influence the level of house prices that is sustainable over time.

The impacts of interest rates on the prices buyers are willing to pay for houses can be explored using a Discounted Cash Flow framework.[1] This framework is relevant for both investors and owner-occupiers, whose interactions in the housing market influence the price of houses. For investors, this approach considers the value today of the future rental income that properties provide, net of costs. For owner-occupiers, the future rental income is replaced by the value of housing services (e.g. shelter) from which the owners benefit. Interest rates, which reflect the future value of a dollar today, are used to translate these future values into present-day values. As interest rates fall, investors and owner-occupiers become willing to pay more for the future returns or benefits that a house provides. This increases housing demand, and pushes up house prices.

Policy constraints on supply exacerbate the impacts of declining interest rates

When supply is unable to respond fully to demand, declining interest rates cause larger increases in house prices. In the longer run when supply can respond more, lower interest rates can induce more house building, by increasing the demand for and the price of houses. This will in turn reduce the price of housing services (such as rents) and limit the impact on house prices.[2] Therefore, the impact of interest rate declines on house prices is likely to be larger in the short run, and also in the long run in countries like New Zealand with significant policy impediments to supply.

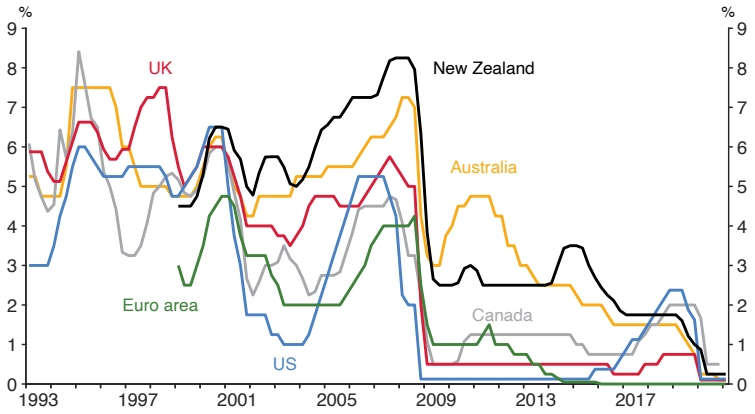
Declines in interest rates that are expected to be more permanent should have greater impacts on the sustainable level of house prices. Intuitively, houses are long-term assets and many people take into account possible future interest rates when purchasing houses. Consistent with this, changes in longer-term interest rates (such as the 5-year mortgage rate) tend to better predict house price inflation than changes in short-term interest rates.

1 See, for example, The tax system and housing demand in New Zealand (Hargreaves, 2008).

2 See A simple model of housing rental and ownership with policy simulations (Coleman and Scobie, 2009).

The decades-long broad decline in interest rates is therefore likely to have led to significantly higher house prices, especially when expressed relative to rents or household incomes. This global trend has been largely outside the control of central banks. It instead reflects the fact that the level of interest rates needed to match savings and investment in the economy (the 'neutral' interest rate) has declined over time.[3] On top of these trends, the Reserve Bank, similarly to other central banks, has used its policy instruments to influence interest rates in order to add and withdraw stimulus to meet its inflation and employment targets (figure 4.6). Being inherently temporary, these cyclical monetary policy changes would be expected to have smaller impacts on house prices.

Figure 4.6
Short-term policy interest rates



Source: Haver Analytics, RBNZ.

House prices may move unsustainably as interest rates change

While it is clear that interest rates and monetary policy can influence the sustainable level of house prices, it is also possible that house prices may move more than is sustainable as interest rates change. For example, by increasing house prices, a decline in interest rates could embed a view that house prices will continue to rise. The resulting expectations of future capital gains (or 'fear of missing out') could encourage buyers to bid prices above what is sustainable. Prices could also move unsustainably if buyers focused on the immediate demand impacts of lower interest rates, and underestimated the eventual supply response that could lower prices later on.

The level of house prices that can be justified by fundamental demand and supply factors has increased over the past few years. The population has grown significantly while the supply of new homes has not grown fast enough to meet demand. Interest rates have also been reduced to historically low levels. The current level of house prices can be explained by these factors, and could be considered sustainable if these factors persist into the future.

However, it is becoming increasingly clear that some of these factors may be reversing and are unlikely to support sustained growth in house prices. Net migration has been low for over a year (figure 4.5) and we do not expect it to return to pre-COVID-19 levels in our projection, even as border restrictions are eased. High levels of building have been rapidly adding to supply, and this is likely to be supported in the future by recent policy changes that allow for more urban development. While monetary policy will remain accommodative for some time, interest rates will eventually increase as the need for low interest rates lessens.

3 See Secular drivers of the global real interest rate (Rachel and Smith, 2015) and Estimating New Zealand's neutral interest rate (Richardson and Williams, 2015).

Additionally, recent tax changes proposed by the Government are likely to reduce the prices investors are willing to pay for houses and will cause some to sell. The Reserve Bank has also reintroduced loan-to-value restrictions (LVRs) to limit higher-risk lending, particularly to investors.

As the long-run determinants of house price growth wane, behavioural factors that have accentuated house price growth, such as 'fear of missing out', may also diminish. Consequently, there is a risk that house prices will fall from their current levels.

We are continuing to develop our understanding of monetary policy's impacts on house prices

The implications of rising house prices, whether sustainable or not, are significant for many New Zealanders. Rising house prices also have different impacts depending on a person's age, generation and home-ownership status, among other factors. The role of monetary policy in contributing to these distributional impacts is an important concern for the Reserve Bank. However, these implications need to be considered alongside the fact that monetary stimulus benefits many New Zealanders by preventing job losses. The Reserve Bank has already begun work to further its understanding of the distributional impacts of monetary policy.[4]

The Reserve Bank is developing its understanding of house price sustainability in discussion with the government agencies directly responsible for housing. As part of this, we will be further assessing the impacts of monetary policy on house price sustainability. This will help us understand how monetary policy transmits through New Zealand's economy and interacts with the Government's housing affordability objective. In setting monetary policy, the MPC remains focused on achieving its inflation and employment objectives.

4 An overview of the distributional effects of monetary policy (Leong, 2021) canvasses the international evidence to date.

Chapter 5
Economic projection

This chapter summarises the baseline economic projection that the MPC considered in making its policy assessment. The projection was finalised on 21 May 2021.

This projection illustrates what the Reserve Bank perceives to be the most likely path for the economy. The projection relies on a set of key assumptions about the global and domestic responses to the COVID-19 pandemic and the subsequent recovery path. Substantially different outcomes could eventuate if these assumptions do not hold. Significant uncertainty surrounds our assumptions about the effectiveness of vaccine programmes, both globally and domestically. There is also uncertainty about how the behaviour of businesses and consumers has changed relative to pre-COVID-19 times, and the effects of significant changes in fiscal policies here and overseas.

The projection takes into account the most recent data, which showed weaker economic activity in late-2020 and a more resilient labour market than previously expected. The factors underpinning this starting point are discussed in chapters 2–4. The projection also accounts for the assumed impacts of significant developments in New Zealand and abroad since the February *Statement*. These include the announced changes to Government policy around housing, the travel bubbles with Australia and the Cook Islands, and *Budget 2021*.

Over the projection, New Zealand is assumed to remain at Alert Level 1 or a lower level of restrictions. Border restrictions are assumed to ease more generally from the beginning of 2022. Thereafter, a more broad-based increase in capacity pressures in the economy is expected. Inflation is boosted by near-term supply shocks that are assumed to be transitory. Inflation returns sustainably to around the 2 percent target mid-point in 2023. Employment returns to around its maximum sustainable level in the second half of the projection.

Monetary policy needs to remain accommodative to maintain momentum in the economy and ensure the MPC meets its inflation and employment objectives.

TABLE 5.1

Table 5.1: Key projection assumptions

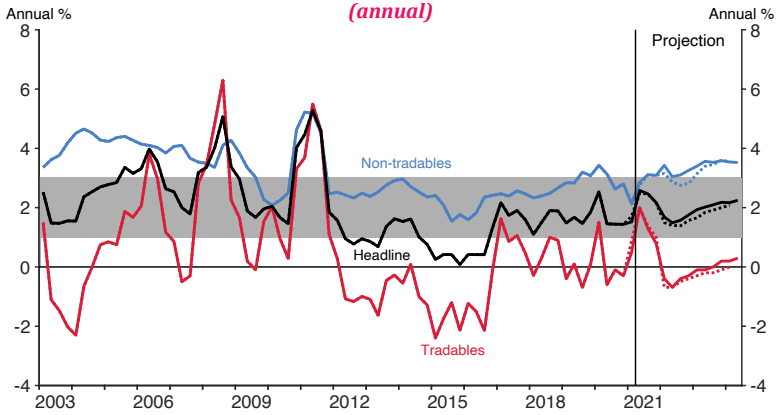
Key factors	**Global growth**	• Annual average GDP growth for our trading partners is projected to recover to 5.7% in 2021 and moderate thereafter. This growth path continues to be supported by strong economic activity in China, improved sentiment around global vaccination roll-outs, and increased government spending in the United States. • The stronger global growth outlook and higher anticipated inflation in our trading-partner economies results in expectations for higher global monetary policy rates, particularly towards the end of the projection. • The New Zealand dollar trade-weighted index (TWI) is assumed to stay around 74.8, well above its pre-COVID-19 levels. • The Dubai oil price is assumed to decline steadily to around $55 USD per barrel over the medium term, in line with futures market pricing.
	Health restrictions	• New Zealand is assumed to remain at Alert Level 1 or a lower level of restrictions over the projection. • The trans-Tasman travel bubble is anticipated to have a small but positive impact on net exports. This impact is particularly noticeable over 2021 as this agreement had not been incorporated in the February *Statement*. However, the uptake of this travel opportunity is expected to be fairly gradual, hampered by concerns over the ongoing stability of the bubble. • Border restrictions are expected to begin to ease more broadly from the beginning of 2022. The majority of New Zealand's adult population is assumed to be fully vaccinated by the end of 2021.
	House prices	• Annual average house price growth is expected to decrease over the projection from 21.5% growth in 2021 to 2.6% in 2023. This reflects a variety of factors including the reintroduction of LVR restrictions, low net immigration, the waning impact of lower interest rates, and increased housing supply. • This slowdown is both larger and faster than expected in the February *Statement*. This is due to the Government's housing policy package announced in March that is assumed to reduce housing demand from residential property investors and support housing supply. No further significant house price increases are expected until the latter half of the projection, when moderate house price growth returns.

Economic growth	**Production**	• GDP is expected to have contracted in the March 2021 quarter, largely driven by weakness in the services sector of the economy. This reflects a softening in domestic consumption, and the lack of international tourists during their peak summer season. Annual GDP growth then accelerates to 3.9% by late 2022 • New Zealand's productive capacity (potential output) has fallen as a result of the measures put in place to contain COVID-19. Productive capacity is assumed to gradually recover towards pre-COVID-19 levels over the projection. In the near term, potential output is hampered by the impact of elevated uncertainty on business investment, and the skills mismatch in the labour market that leads to higher structural unemployment. These temporary disruptions dissipate as border restrictions ease.
	Consumption	• Consumption is expected to soften in the first quarter of 2021, largely reflecting waning pent-up demand. Consumption is projected to be weighed down by the impact of weaker house price growth on consumer confidence and wealth accumulation, although a more resilient labour market provides some offsetting support. • Nevertheless, consumption remains above pre-COVID-19 levels over the projection horizon, reaching a peak annual growth rate of 3.4% in late 2022.
	Investment	• We project business investment will be higher than in the February *Statement*. This largely reflects the positive impact of stronger-than-expected commodity prices on business sentiment and activity. • However, business investment is expected to remain below pre-COVID-19 levels until mid-2022, hampered by elevated levels of uncertainty. • Residential investment peaks in the June 2021 quarter reflecting recent strong annual residential building consents issuance. Residential investment is expected to remain elevated over the near term, with limited spare capacity in the construction sector. • Residential investment begins to soften from 2022 as housing demand weakens and the sector works through existing projects. The Government's Housing Acceleration Fund and easier urban planning rules in some areas are assumed to support residential investment over the medium term.
	Exports and imports	• Strong global demand, particularly from China, is expected to underpin continued demand for New Zealand's exports, notably for dairy products. This supports significantly stronger, albeit moderating, export prices over the projection. • Import prices are also somewhat higher than previously expected, largely driven by higher oil prices and the impact of supply-chain disruptions on the cost of goods and services. • The terms of trade is significantly higher than expected in the February *Statement*. The current account balance is further supported in the near term by the net positive impact of the travel bubbles, albeit from a lower starting point due to a stronger rebound in import volumes.

Labour market	**Employment and wages**	• The unemployment rate is assumed to have peaked at 5.2% in the September 2020 quarter. Over the projection, the unemployment rate is assumed to gradually return to 4.3% as economic activity recovers and capacity pressures begin to rise. Employment is expected to return to around its maximum sustainable level in the second half of the projection. • Structural unemployment is assumed to be elevated relative to pre-COVID-19 levels, largely reflecting a skills mismatch in the New Zealand labour market. This has lowered the level of maximum sustainable employment. Currently, employment is estimated to be closer to, but still below, its maximum sustainable level. • Annual LCI private sector wage inflation is assumed to accelerate from 1.6% in the March 2021 quarter to 2.4% at the end of the year, reflecting the April 2021 minimum wage increase and a tightening labour market. Annual wage inflation peaks at 2.6% later in the projection as capacity pressures tighten. • Net working-age immigration is projected to be around 1,500 people over 2021, with the assumption that the trans-Tasman bubble has no significant impact on the net flow of migrants. Net immigration is assumed to gradually increase as border restrictions ease to a long-run average of about 24,000 people per year.
Inflation	**Headline**	• CPI inflation remains within the 1–3% target band over the projection, but is slightly above the 2% midpoint towards the end of the projection. • Headline inflation is projected to peak at around 2.6% in the near term, but the factors lifting inflation are assumed to be relatively short-lived. Headline inflation is expected to decline to below 2% in 2022, and only return to the midpoint of the target range over the medium term as capacity pressures emerge more sustainably.
	Tradables	• Annual tradables inflation is expected to temporarily increase to 2% in the June 2021 quarter, largely due to recent increases in oil prices and the impact of supply-chain disruptions. • Over the medium term, moderating oil prices and a relatively strong TWI keep annual tradables inflation muted, reaching 0.3% by the end of the projection.
	Non-tradables	• Annual non-tradables inflation remains between 2.6% to 3.6% over the projection. • High starting-point momentum in house prices and construction costs supports housing-related components of non-tradables inflation in the near term and into coming years. More generally, non-tradables inflation is supported by rising capacity pressures over the projection.

Charts

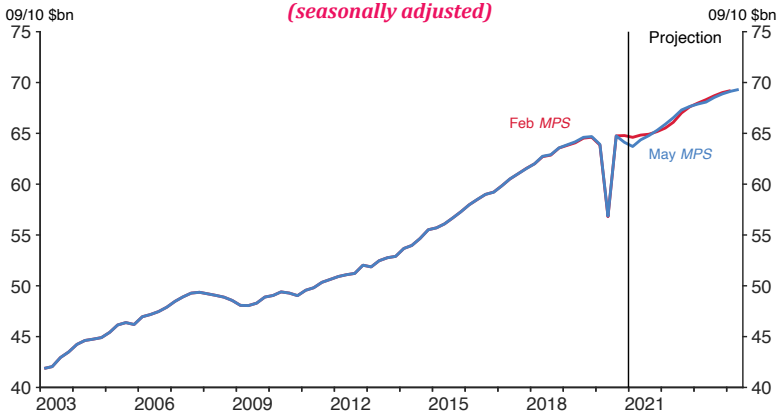
Figure 5.1
Inflation breakdown
(annual)



Source: Stats NZ, RBNZ estimates.

Note: Dotted lines show the baseline scenario from the February *Statement*.

Figure 5.2
Quarterly production GDP
(seasonally adjusted)

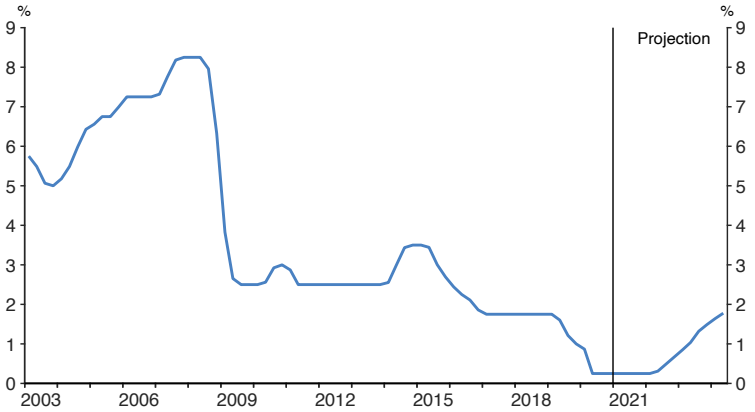


Source: Stats NZ, RBNZ estimates.

Figure 5.3
Unemployment rate
(seasonally adjusted)

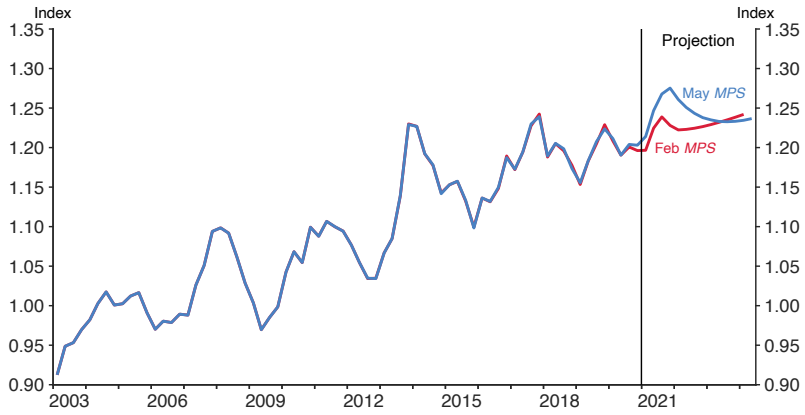
Source: Stats NZ, RBNZ estimates.

Figure 5.4
OCR



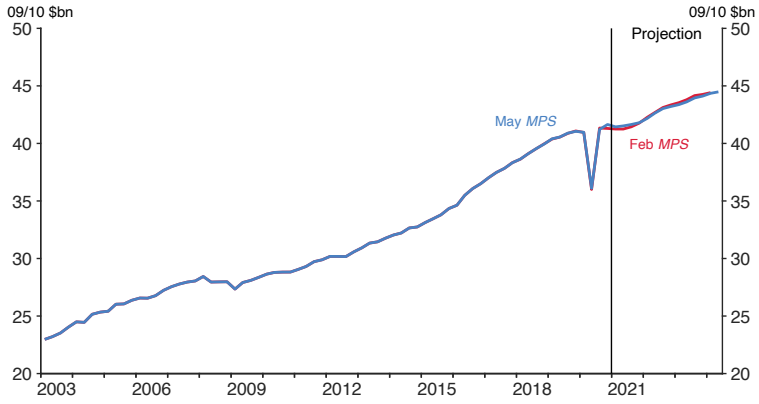
Source: RBNZ estimates.

Figure 5.5
Terms of trade



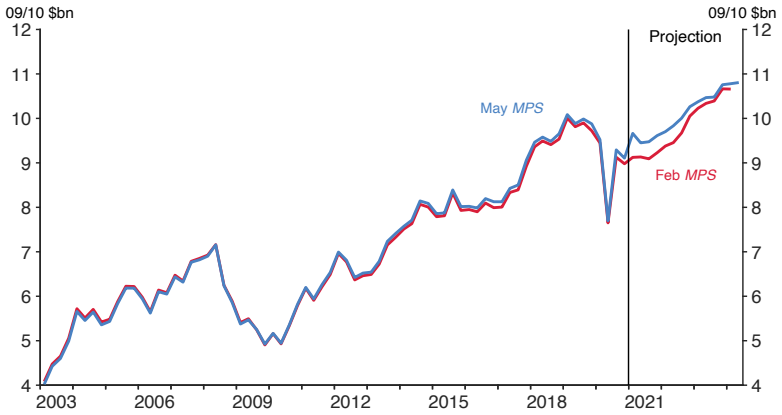
Source: Stats NZ, RBNZ estimates.

Figure 5.6
Household consumption
(seasonally adjusted)



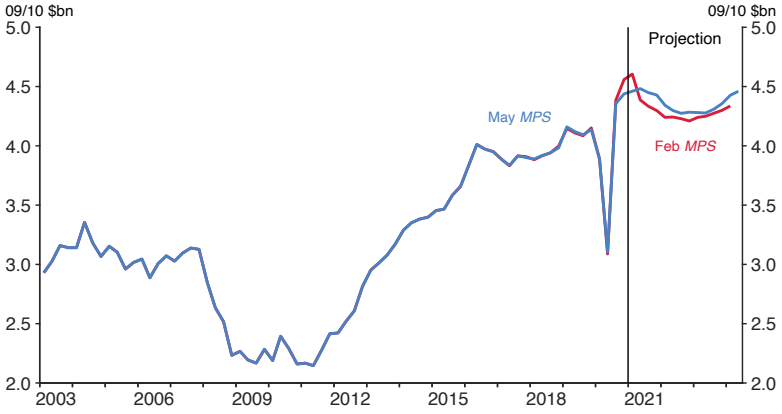
Source: Stats NZ, RBNZ estimates.

Figure 5.7
Business investment
(seasonally adjusted)



Source: Stats NZ, RBNZ estimates.

Figure 5.8
Residential investment
(seasonally adjusted)



Source: Stats NZ, RBNZ estimates.

Chapter 6
Appendices

Appendix 1:
Our recent research

This appendix summarises the Reserve Bank's monetary policy-related research and speeches made by the Reserve Bank's senior leaders at various forums over the past six months. The monetary policy-related **research** produced by Reserve Bank staff is disseminated through *Analytical Notes, Bulletin articles, Discussion Papers*, and academic journal publications. The Reserve Bank has also initiated a series of **videos** where our staff present their published research.

Analytical notes and discussion papers

An overview of the distributional effects of monetary policy

Changes in interest rates and central bank asset purchases affect those with assets and those with debt differently. Jinny Leong reviews the international literature on the distributional effects of monetary policy on wealth and income. She concludes that the empirical evidence is inconclusive. It is not clear that monetary policy easing necessarily reduces or worsens wealth inequality and income inequality.

Down to business: Which QSBO measures are the best at forecasting?

New Zealand's key official data on economic activity and the labour market are published with a considerable lag. However, the *Quarterly Survey of Business Opinion* (QSBO) provides an array of economic indicators that can be used to make a more timely assessment of New Zealand's economy. But which QSBO measures provide reliable forecasts? Hamish Fitchett and Finn Robinson find that QSBO profitability measures perform the best for forecasting GDP growth, while domestic trading activity measures perform the best for forecasting employment.

Drivers of New Zealand business investment

Understanding the drivers of business investment allows us to better understand how monetary policy transmits to the economy through this channel. Julia Ratcliffe and Eric Tong find that aggregate demand, financial conditions and uncertainty exert significant influences on business investment in New Zealand.

Star Wars at central banks

How credible is central bank research? For example, do researchers at central banks favour methods that yield the most statistically significant results? Hamish Fitchett and co-authors confirm that this is not the case. They search for researcher bias in studies by central banks and in top economics journals. They conclude that central banks are more likely than top economics journals to publish research that does not yield statistically significant results.

External publications

Our staff regularly publish their work in peer-reviewed journals, conference volumes, and external working paper series at universities and other central banks. The quality control by the wider community of technical experts ensures that the analytical frameworks that underpin our policy formulation remain rigorous, and are updated with the latest advances in economic theory and statistical methodologies.

Nowcasting GDP using machine-learning algorithms: A real-time assessment

International Journal of Forecasting
Adam Richardson, Thomas van Florenstein Mulder, and Tuğrul Vehbi

Speeches on monetary policy

This section lists recent Reserve Bank speeches on monetary policy that have been made available on the Reserve Bank website.

Monetary policy challenges for a small open economy during COVID-19

2 December 2020

Governor Adrian Orr describes the Reserve Bank's response to the pandemic crisis. He outlines how the Reserve Bank's monetary and financial policy measures helped support New Zealand's economy, complementing the Government's fiscal initiatives.

Finance and Expenditure Committee 2019/20 Reserve Bank Annual Review

10 February 2021

Adrian Orr talks of how the challenges that the Reserve Bank experienced during the COVID-19 disruptions have reinforced the importance of identifying and managing risks, working collectively and collaboratively, and adapting to necessary changes.

Some policy lessons from a year of COVID-19

4 March 2021

Adrian Orr provides an overview of the Reserve Bank's policy experience a year after the pandemic began. The speech addresses a range of issues, including changes to New Zealand's economic environment, the roles of monetary and fiscal policy, and the repercussions of monetary policy on income and wealth inequality.

The future is Māori

Reserve Bank Assistant Governor Christain Hawkesby discussed how Māori values are becoming an increasingly integral part of Aotearoa New Zealand's society, and the implications for New Zealand's economy.

Appendix 2: Statistical tables

TABLE 6.1

Key forecast variables

		GDP growth Quarterly	CPI inflation Quarterly	CPI inflation Annual	TWI	OCR
2019	Mar	0.5	0.1	1.5	74.0	1.8
	Jun	0.5	0.6	1.7	72.6	1.6
	Sep	0.7	0.7	1.5	72.0	1.2
	Dec	0.1	0.5	1.9	71.3	1.0
2020	Mar	-1.2	0.8	2.5	70.9	0.9
	Jun	-11.0	-0.5	1.5	69.7	0.3
	Sep	13.9	0.7	1.4	72.0	0.3
	Dec	-1.0	0.5	1.4	72.9	0.3
2021	Mar	**-0.6**	0.8	1.5	74.9	0.3
	Jun	**1.0**	**0.6**	**2.6**	**74.8**	**0.3**
	Sep	**0.6**	**0.6**	**2.5**	**74.8**	**0.3**
	Dec	**0.8**	**0.2**	**2.2**	**74.8**	**0.3**
2022	Mar	**0.9**	**0.4**	**1.7**	**74.8**	**0.3**
	Jun	**1.0**	**0.4**	**1.5**	**74.8**	**0.3**
	Sep	**1.1**	**0.6**	**1.6**	**74.8**	**0.5**
	Dec	**0.5**	**0.4**	**1.8**	**74.8**	**0.7**
2023	Mar	**0.4**	**0.5**	**1.9**	**74.8**	**0.9**
	Jun	**0.3**	**0.5**	**2.0**	**74.8**	**1.0**
	Sep	**0.7**	**0.7**	**2.1**	**74.8**	**1.3**
	Dec	**0.5**	**0.4**	**2.2**	**74.8**	**1.5**
2024	Mar	**0.4**	**0.5**	**2.2**	**74.8**	**1.6**
	Jun	**0.3**	**0.5**	**2.2**	**74.8**	**1.8**

TABLE 6.2

Measures of inflation, inflation expectations, and asset prices

	2019		2020				2021	
	Sep	Dec	Mar	Jun	Sep	Dec	Mar	Jun
Inflation (annual rates)								
CPI	1.5	1.9	2.5	1.5	1.4	1.4	1.5	
CPI non-tradables	3.2	3.1	3.4	3.1	2.6	2.8	2.1	
CPI tradables	-0.7	0.1	1.5	-0.6	-0.1	-0.3	0.5	
Sectoral factor model estimate of core inflation	1.7	1.7	1.7	1.7	1.7	1.8	1.9	
CPI trimmed mean (30 percent measure)	1.8	2.1	2.7	2.1	1.7	2.2	1.7	
CPI weighted median	2.3	2.3	2.8	2.4	2.2	2.7	2.3	
GDP deflator (expenditure)	2.3	3.6	3.7	2.7	1.7	0.7		
Inflation expectations								
ANZ Business Outlook – inflation one year ahead (quarterly average to date)	1.7	1.7	1.7	1.4	1.4	1.5	1.9	2.1
RBNZ Survey of Expectations – inflation 2 years ahead	1.9	1.8	1.9	1.2	1.4	1.6	1.9	2.0
RBNZ Survey of Expectations – inflation 5 years ahead	1.9	2.0	2.0	1.8	1.9	1.9	2.0	2.1
RBNZ Survey of Expectations – inflation 10 years ahead	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0
Long-run inflation expectations*	2.0	2.0	1.8	1.8	2.0	2.0	2.1	2.1
Asset prices (annual percent changes)								
Quarterly house price index (CoreLogic NZ)	3.0	4.4	7.7	7.1	10.7			
REINZ Farm Price Index (quarterly average)	1.1	-0.8	-12.5	-8.0	-3.7	-0.5	7.3	
NZX 50 (quarterly average)	18.6	25.7	21.1	6.4	8.6	13.2	14.4	17.5

*Long-run expectations are extracted from a range of surveys using a Nelson-Siegel model. Souce: ANZ Bank, Aon-Hewitt Consulting, Consensus Economics, RBNZ estimates.

TABLE 6.3

Measures of labour market conditions

(seasonally adjusted, changes expressed in annual percent terms)

	2019		2020				2021
	Sep	Dec	Mar	Jun	Sep	Dec	Mar
Household Labour Force Survey							
Unemployment rate	4.1	4.1	4.3	4.0	5.2	4.9	4.7
Underutilisation rate	10.3	10.1	10.5	12.0	13.1	11.8	12.2
Labour force participation rate	70.7	70.4	70.7	69.9	70.2	70.2	70.4
Employment rate (percentage of working-age population)	67.7	67.6	67.7	67.1	66.5	66.8	67.1
Employment growth	1.0	1.2	2.6	1.7	0.5	0.8	0.3
Average weekly hours worked	34.2	33.8	34.1	30.6	33.7	34.9	33.9
Number unemployed (thousand people)	117	115	122	115	151	140	135
Number employed (million people)	2.71	2.71	2.74	2.74	2.72	2.74	2.75
Labour force (million people)	2.82	2.83	2.86	2.85	2.87	2.88	2.89
Extended labour force (million people)	2.91	2.92	2.96	2.96	2.98	2.97	2.99
Working-age population (million people)	3.99	4.02	4.05	4.08	4.09	4.09	4.10
Quarterly Employment Survey – QEM							
Filled jobs growth	2.9	3.1	2.7	0.6	-1.0	-0.2	-1.1
Average hourly earnings growth (private sector, ordinary time)	3.0	2.5	3.7	2.9	3.9	4.6	3.0
Other data sources							
Labour cost index growth, private sector	2.3	2.4	2.4	1.7	1.6	1.5	1.6
Labour cost index growth, private sector, unadjusted	3.8	3.7	3.6	2.8	2.6	2.4	2.8
Estimated net migration (published, thousands, quarterly)	16.0	21.4					
Change in All Vacancies Index	-1.1	-5.5	-16.1	-48.5	-17.9	-0.3	20.6

Note: The All Vacancies Index is produced by MBIE as part of the Jobs Online report, which shows changes in job vacancies advertised by businesses on internet job boards. The unadjusted labour cost index (LCI) is an analytical index that reflects quality change in addition to price change (whereas the official LCI measures price changes only). For definitions of underutilisation, the extended labour force, and related concepts, see Statistics New Zealand (2016), *Introducing underutilisation in the labour market*. Estimated net migration (published) is the Stats NZ outcomes-based measure.

TABLE 6.4

Composition of real GDP growth

(annual average percent change, seasonally adjusted, March years, unless specified otherwise)

	Actuals							Projection			
March year	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Final consumption expenditure											
Private	3.9	3.3	4.2	6.5	4.9	4.4	2.8	**-1.9**	**4.2**	**3.1**	**2.2**
Public authority	2.1	3.4	2.3	2.2	3.4	3.7	6.1	**5.0**	**3.1**	**2.1**	**0.9**
Total	**3.5**	**3.3**	**3.7**	**5.5**	**4.6**	**4.2**	**3.6**	**-0.3**	**3.9**	**2.8**	**1.9**
Gross fixed capital formation											
Residential	15.2	8.3	7.1	8.8	-1.8	3.0	1.5	**0.8**	**8.2**	**-3.2**	**1.4**
Other	7.6	7.9	2.8	0.3	10.7	6.6	1.1	**-7.4**	**10.0**	**6.5**	**3.9**
Total	**9.4**	**8.0**	**3.9**	**2.5**	**7.3**	**5.7**	**1.2**	**-5.3**	**9.5**	**4.0**	**3.3**
Final domestic expenditure	4.8	4.4	3.8	4.8	5.2	4.6	3.0	**-1.5**	**5.2**	**3.1**	**2.2**
Stockbuilding*	-0.2	0.5	-0.3	0.1	0.2	-0.1	-0.5	**-0.6**	**1.1**	**-0.1**	**0.0**
Gross national expenditure	**4.5**	**4.6**	**3.3**	**5.0**	**5.7**	**4.5**	**2.4**	**-2.3**	**6.5**	**3.0**	**2.2**
Exports of goods and services	0.1	4.7	6.6	1.7	3.6	3.2	-0.2	**-14.6**	**3.3**	**9.8**	**4.8**
Imports of goods and services	8.1	7.7	2.6	5.6	7.8	4.4	1.0	**-16.6**	**13.5**	**7.1**	**5.3**
Expenditure on GDP	**2.1**	**3.7**	**4.4**	**3.8**	**4.4**	**4.1**	**2.1**	**-0.9**	**3.8**	**3.3**	**1.9**
GDP (production)	2.7	3.8	3.7	3.7	3.6	3.3	1.7	**-3.1**	**4.4**	**3.5**	**2.0**
GDP (production, March qtr to March qtr)	3.5	3.8	4.1	3.2	3.6	3.0	0.1	**-0.3**	**3.4**	**3.0**	**1.8**

*Percentage point contribution to the growth rate of GDP.

TABLE 6.5

Summary of economic projection

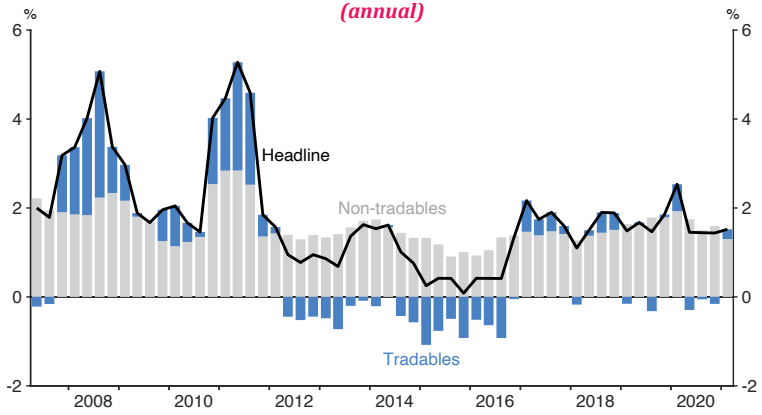
(annual percent change for March years unless specified otherwise)

March year	Actuals 2014	2015	2016	2017	2018	2019	2020	2021	Projection 2022	2023	2024
Price measures											
CPI	1.5	0.3	0.4	2.2	1.1	1.5	2.5	1.5	**1.7**	**1.9**	**2.2**
Labour costs	1.7	1.8	1.8	1.5	1.9	2.0	2.4	1.6	**2.4**	**2.6**	**2.5**
Export prices (in New Zealand dollars)	11.5	-9.2	-0.3	3.9	3.2	1.3	7.4	**-5.2**	**3.4**	**-1.8**	**0.5**
Import prices (in New Zealand dollars)	-3.0	-3.4	1.2	0.6	1.8	4.2	2.5	**-5.4**	**-0.4**	**0.3**	**0.6**
Monetary conditions											
OCR (year average)	2.5	3.4	2.9	2.0	1.8	1.8	1.2	0.3	**0.3**	**0.6**	**1.4**
TWI (year average)	77.6	79.3	72.6	76.5	75.6	73.4	71.7	72.4	**74.8**	**74.8**	**74.8**
Output											
GDP (production, annual average % change)	2.7	3.8	3.7	3.7	3.6	3.3	1.7	**-3.1**	**4.4**	**3.5**	**2.0**
Potential output (annual average % change)	2.6	3.1	3.2	3.2	3.1	3.0	2.4	**-2.6**	**4.2**	**2.0**	**1.9**
Output gap (% of potential GDP, year average)	-1.5	-0.8	-0.3	0.1	0.6	0.9	0.2	**-0.4**	**-0.2**	**1.3**	**1.3**
Labour market											
Total employment (seasonally adjusted)	4.0	3.6	2.2	5.9	2.9	1.5	2.6	0.3	**0.9**	**1.2**	**1.4**
Unemployment rate (March qtr, seasonally adjusted)	5.6	5.5	5.3	4.9	4.4	4.2	4.3	4.7	**4.7**	**4.5**	**4.4**
Trend labour productivity	0.8	0.7	0.6	0.4	0.2	0.1	0.1	**0.4**	**0.6**	**0.8**	**0.8**

March year	Actuals							Projection			
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Key balances											
Government operating balance (% of GDP, year to June)	-1.2	0.2	0.7	1.5	1.9	2.4	-7.3	**-4.9**	**-5.8**	**-3.5**	**-2.8**
Current account balance (% of GDP)	-2.5	-3.5	-2.5	-2.7	-3.2	-3.9	-2.8	**-1.7**	**-2.9**	**-3.0**	**-3.8**
Terms of trade (SNA measure, annual average % change)	11.7	-0.3	-3.0	2.6	4.6	-2.5	2.0	**-0.3**	**5.0**	**-1.7**	**-0.7**
Household saving rate (% of disposable income)	1.2	-0.3	0.0	0.3	-0.1	0.5	0.4	**3.8**	**1.7**	**0.8**	**0.2**
World economy											
Trading-partner GDP (annual average % change)	3.5	3.7	3.5	3.5	3.9	3.5	1.6	**-1.0**	**5.5**	**4.3**	**3.3**
Trading-partner CPI (TWI weighted)	2.3	1.0	1.2	1.9	1.8	1.4	2.4	**0.7**	**2.0**	**2.0**	**2.2**

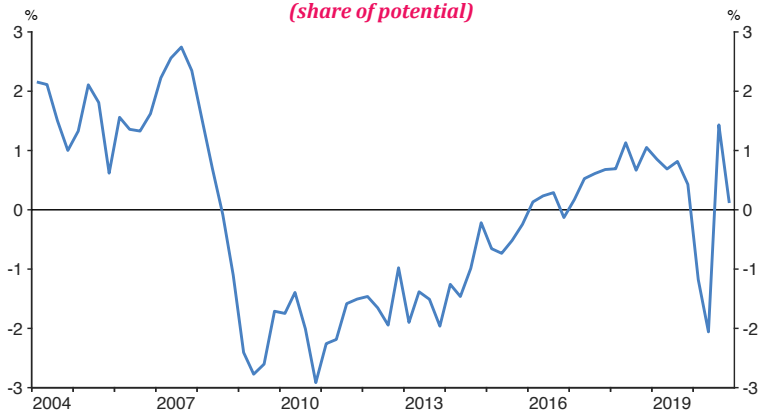
Appendix 3: Chart pack

Figure 6.1
Composition of CPI inflation
(annual)



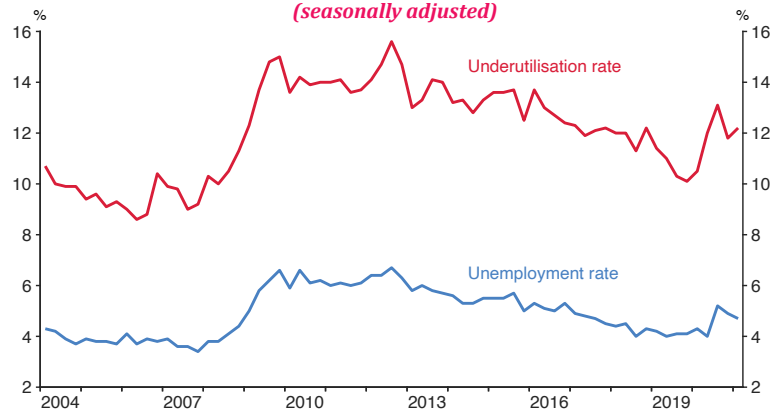
Source: Stats NZ, RBNZ estimates.

Figure 6.2
Output gap
(share of potential)



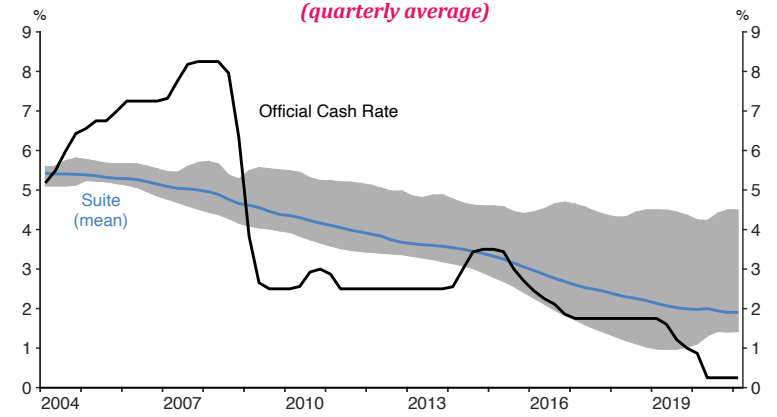
Source: Stats NZ, RBNZ estimates.

Figure 6.3
Unemployment and underutilisation rates
(seasonally adjusted)



Source: Stats NZ.

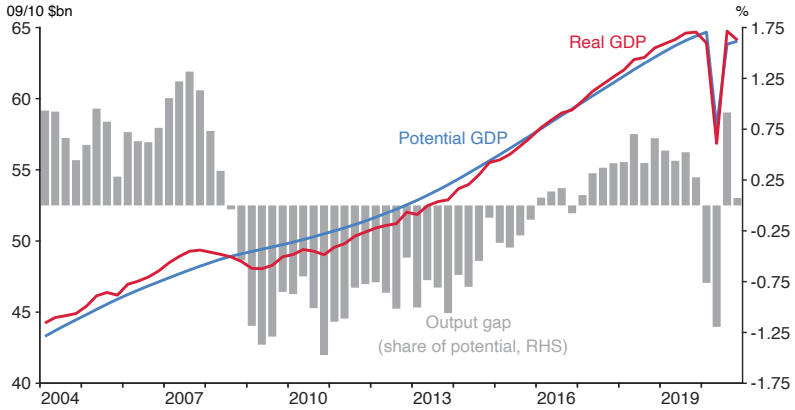
Figure 6.4
OCR and neutral OCR indicator suite
(quarterly average)



Source: RBNZ estimates.

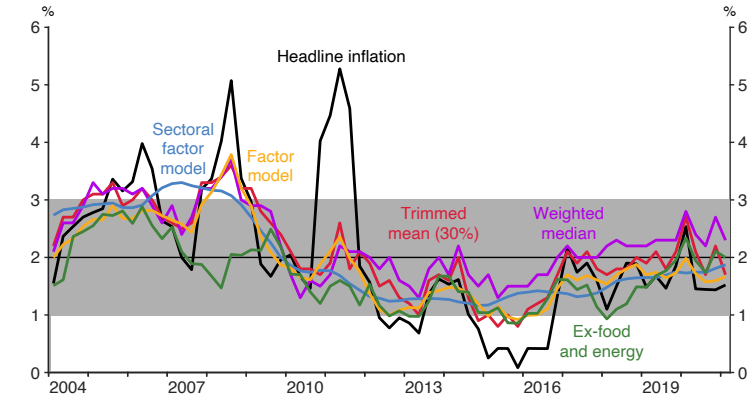
Note: Shaded area indicates the range between the maximum and minimum values from a suite of neutral OCR indicators.

Figure 6.5
GDP and potential GDP



Source: Stats NZ, RBNZ estimates.

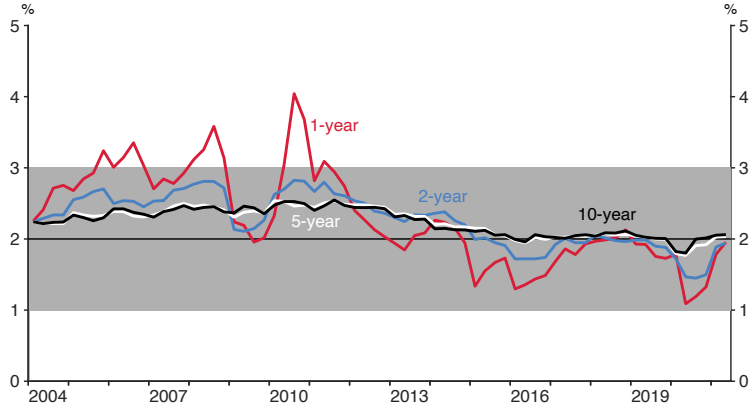
Figure 6.6
Headline inflation and core inflation
(annual)



Source: Stats NZ, RBNZ estimates.

Note: Core inflation measures exclude the GST increase in 2010.

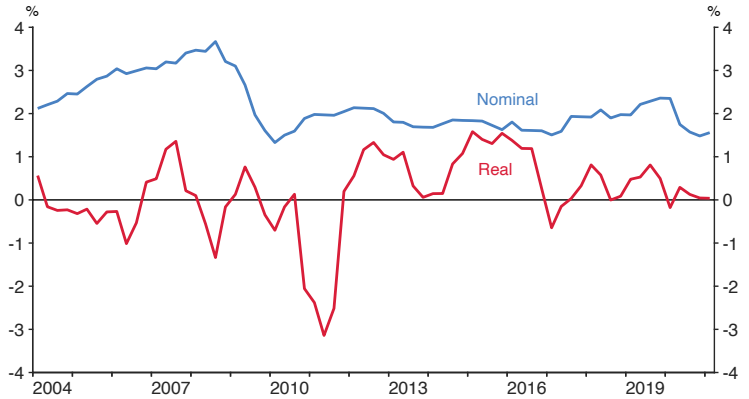
Figure 6.7
Inflation expectations
(annual)



Source: RBNZ estimates.

Note: Inflation expectations are estimates from the RBNZ inflation expectations curve, based on surveys of businesses and professional forecasters.

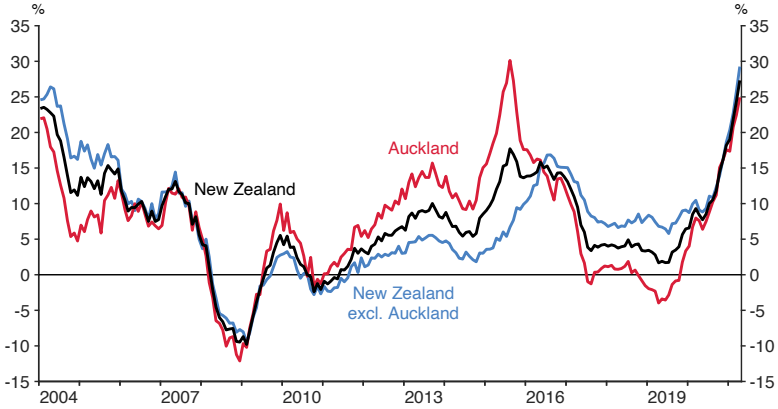
Figure 6.8
Private sector wage growth
(annual)



Source: Stats NZ, RBNZ estimates.

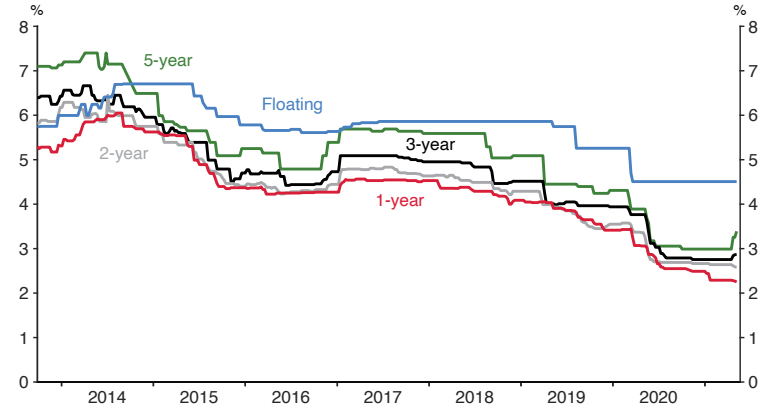
Note: Private sector wage growth is measured by the labour cost index, all salary and wage rates, private sector. Real labour cost index is deflated with headline CPI inflation.

Figure 6.9
House price inflation
(annual)



Source: REINZ.

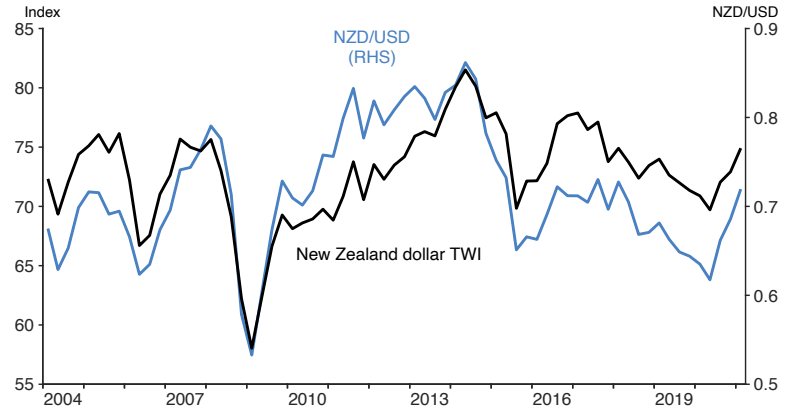
Figure 6.10
Mortgage rates



Source: interest.co.nz, RBNZ estimates.

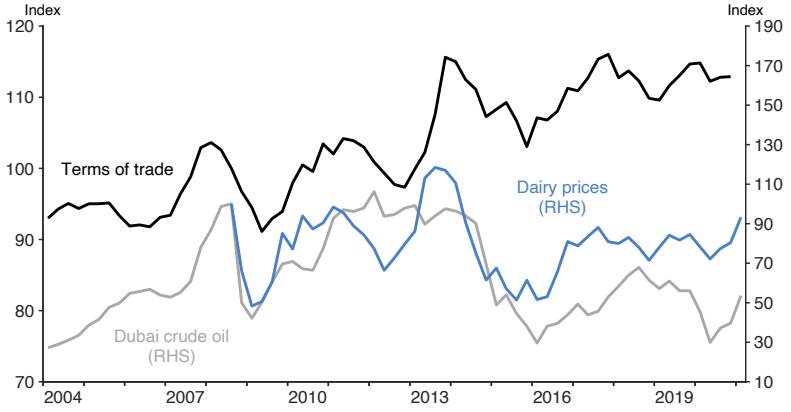
Note: The rates shown for each term are the average of the latest rates on offer from ANZ, ASB, BNZ, and Westpac.

Figure 6.11
New Zealand dollar exchange rates



Source: Reuters, RBNZ estimates.

Figure 6.12
Terms of trade, dairy and oil price indices



Source: Stats NZ, Global Dairy Trade, Reuters, RBNZ estimates.