Monetary Policy Statement

August 2019

Projections and data finalised on 1 August 2019.
Policy assessment and summary record of meeting finalised on 7 August 2019.

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The remit for the Monetary Policy Committee
Reserve Bank of New Zealand

The Government's Economic Objective

The Government's economic objective is to improve the wellbeing and living standards of New Zealanders through a sustainable, productive and inclusive economy. Our priority is to move towards a low carbon economy, with a strong diversified export base, that delivers decent jobs with higher wages and reduces inequality and poverty.

Context

Monetary policy plays an important role in supporting the Government's economic objective. The Reserve Bank of New Zealand Act 1989 (the Act) requires that monetary policy promote the prosperity and wellbeing of New Zealanders, and contribute to a sustainable and productive economy. Monetary policy contributes to public welfare by reducing cyclical variations in employment and economic activity whilst maintaining price stability over the medium term.

This remit is issued by the Minister of Finance to the Monetary Policy Committee (MPC) under Clause 3, Schedule 1 of the Act.

1) Monetary Policy Objectives

a) Under Section 8 of the Act the Reserve Bank, acting through the MPC, is required to formulate monetary policy with the goals of maintaining a stable general level of prices over the medium term and supporting maximum sustainable employment.

2) Operational Objectives

a) For the purpose of this remit the MPC's operational objectives shall be to:

i. 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. This target will be defined in terms of the All Groups Consumers Price Index, as published by Statistics New Zealand; and

ii. support maximum sustainable employment. The MPC should consider a broad range of labour market indicators to form a view of where employment is relative to its maximum
sustainable level, taking into account that the level of
maximum sustainable employment is largely determined by
non-monetary factors that affect the structure and dynamics
of the labour market and is not directly measurable.

b) In pursuing the operational objectives, the MPC shall:

i. have regard to the efficiency and soundness of the financial
   system;

ii. seek to avoid unnecessary instability in output, interest rates,
    and the exchange rate; and

iii. discount events that have only transitory effects on inflation,
    setting policy with a medium-term orientation.

Agreed by

Ron Grant Robertson
Minister of Finance

Adrian Orr
Governor of the Reserve Bank of New Zealand
Chapter 1
Policy assessment

Tēnā koutou katoa, welcome all.

The Official Cash Rate (OCR) is reduced to 1.0 percent. The Monetary Policy Committee agreed that a lower OCR is necessary to continue to meet its employment and inflation objectives.

Employment is around its maximum sustainable level, while inflation remains within our target range but below the 2 percent mid-point. Recent data recording improved employment and wage growth is welcome.

GDP growth has slowed over the past year and growth headwinds are rising. In the absence of additional monetary stimulus, employment and inflation would likely ease relative to our targets.

Global economic activity continues to weaken, easing demand for New Zealand’s goods and services. Heightened uncertainty and declining international trade have contributed to lower trading-partner growth. Central banks are easing monetary policy to support their economies. Global long-term interest rates have declined to historically low levels, consistent with low expected inflation and growth rates into the future.

In New Zealand, low interest rates and increased government spending will support a pick-up in demand over the coming year. Business investment is expected to rise given low interest rates and some ongoing capacity constraints. Increased construction activity also contributes to the pick-up in demand.

Our actions today demonstrate our ongoing commitment to ensure inflation increases to the mid-point of the target range, and employment remains around its maximum sustainable level.

Meitaki, thanks.

Adrian Orr

Governor
Summary record of meeting

The Monetary Policy Committee agreed there was a need for further monetary stimulus to meet its inflation and employment objectives.

The Committee noted recent economic developments were broadly as expected and employment was around the targeted maximum sustainable level. The Committee was pleased to see that the labour market data held up relative to expectations in the June 2019 quarter.

However, the Committee noted that inflation remains below 2 percent and the outlook for employment and inflation was softer. GDP growth had slowed and global conditions had weakened.

The Committee agreed that the balance of risks to achieving its consumer price inflation and maximum sustainable employment objectives was tilted to the downside, although members placed different emphasis on the sensitivities to these risks.

The Committee noted the decline in long-term government bond yields to historically low levels. Financial market participants expect both inflation and policy interest rates to remain low globally for a prolonged period. Some members noted that survey measures of short-term inflation expectations in New Zealand had declined recently. Others were encouraged that longer-term expectations remained anchored at close to 2 percent.

The Committee agreed that weak global economic conditions could see imported inflation remain low if global growth slows further or if commodity prices decline. The members discussed the range of appropriate policy responses should imported inflation persist at low levels.

The Committee welcomed the recent employment and wage data but noted that private sector wage growth was subdued despite businesses having difficulty finding labour. The members discussed that the recent slowdown in growth could dampen wage inflation by more than assumed. Some noted that if cost pressures remain elevated, firms may pass on costs to consumer prices by more than assumed, while others viewed the wage pass through as a natural consequence of a tight labour market and policy stimulus.

The members discussed the recent slower domestic GDP growth and the impact of slowing global demand on New Zealand through the trade, financial and confidence channels. The members noted that heightened global uncertainty was reducing investment and suppressing trading-partner growth. This highlighted the risk of a larger or more prolonged slowdown in global economic growth.

The Committee noted that additional stimulus from central banks had underpinned growth and reduced the likelihood of a more-pronounced slowdown. However, some thought that even with support from monetary stimulus, considerable economic and policy uncertainty could see global growth continue to decline. Other members noted that the easing in global financial conditions since the beginning of the year, or a shift in political environment, could lead to a pick-up in global growth over the next year.

The Committee acknowledged the importance of additional spending from households, businesses, and the government, to meet their inflation and employment targets. They also agreed that additional monetary
stimulus was needed. The members discussed several important uncertainties.

The Committee noted that low business confidence had dampened business investment in 2018 and had remained weak in mid-2019. The members discussed that if sentiment remained low, perhaps due to global economic conditions or if profitability remains squeezed, growth might not increase as anticipated over the medium term. The members also noted that the shift in domestic production from manufacturing towards services was also dampening business investment.

The outlook for household spending was discussed with regard to the assumed dampening impact of soft house price inflation. Some members noted lower mortgage rates could contribute to a stronger pick-up in house price inflation, which could support consumption. Other members noted that house price inflation could remain weak, for example if net immigration continued to decline relative to the number of new houses being constructed.

The Committee noted that fiscal assumptions embedded in the projections were consistent with Budget 2019, which included adjustments to reflect that government spending takes time to increase. The members discussed that fiscal policy could be more supportive if future announcements incorporate more spending or if the impact on domestic demand is larger than assumed. This view was balanced by the impact of any increase in government spending being delayed, for example due to timing of the implementation of new initiatives and difficulty finding labour.

The Committee also discussed the contribution of monetary policy to the projected pick-up in growth and inflation. The members noted that estimates of the neutral level of interest rates have continued to decline and this was consistent with generally lower interest rates over time. Members also noted the Bank’s current assessment of analysis on the transmission from monetary policy to growth and inflation. This suggested that the overall strength of these relationships was little changed in the environment of low interest rates. The Committee agreed to continue to monitor and assess the impacts of monetary policy, including the transmission through to retail interest rates.

The Committee reached a consensus that, relative to the May Statement, a lower path for the OCR over the projection period was appropriate. The lower OCR path reflected the economic projections and the balance of risks discussed.

The members debated the relative benefits of reducing the OCR by 25 basis points and communicating an easing bias, versus reducing the OCR by 50 basis points now. The Committee noted both options were consistent with the forward path in the projections. The Committee reached a consensus to cut the OCR by 50 basis points to 1.0 percent. They agreed that the larger initial monetary stimulus would best ensure the Committee continues to meet its inflation and employment objectives.

Attendees

Reserve Bank staff: Adrian Orr, Geoff Bascand, Christian Hawkesby, Yuong Ha

External: Bob Buckle, Peter Harris, Caroline Saunders

Observer: Bryan Chapple

Secretary: Chris McDonald
Chapter 2
Key policy judgements

- Economic growth has slowed over the past year and is likely to remain soft in the near term. Subdued house price inflation and low business confidence are suppressing domestic demand.

- Global economic conditions continue to weaken. Declining trade and heightened uncertainty have contributed to lower trading-partner growth. Central banks are easing monetary policy to support their economies.

- Employment is currently near its maximum sustainable level and underlying inflation has risen moderately over recent years. However, with inflation still below 2 percent and domestic growth slowing, additional monetary stimulus is required to achieve our employment and inflation objectives in the medium term.

- Monetary and fiscal stimulus is expected to give impetus to growth from later this year.

Additional monetary stimulus is needed to achieve our objectives

Slower GDP growth over the past year is expected to reduce capacity pressure and reduce employment relative to its maximum sustainable level in the near term. Inflation is likely to remain below the 2 percent target mid-point throughout 2019 and into 2020. Without additional stimulus, inflation and employment are likely to be below their targets over the medium term. As a result, a lower OCR is necessary to achieve our objectives (figure 2.1).

Low inflation persists, despite capacity pressure

A key judgement affecting monetary policy is how persistent we think low inflation will be.

Prior to mid-2018, low interest rates and supportive global conditions contributed to an upswing in the economy and there were signs of increasing capacity pressure, including in the labour market. Employment increased to near its maximum sustainable level and has remained around this level since, although the range of estimates is wide (see table 5.1).
Despite this earlier improvement in economic conditions, annual CPI inflation and most measures of core inflation remain below 2 percent (figure 2.2). Subdued CPI inflation partly reflects low imported inflation, which has held down tradables inflation since 2012. Tradables inflation is expected to decline in the near term before gradually rising to slightly below its long-term average.

Weak pricing behaviour has also dampened inflation. Although survey measures suggest inflation expectations remain anchored at around 2 percent, firms and households continue to reflect past low inflation in their pricing decisions. Globally, financial market participants expect both inflation and policy interest rates to remain low for a prolonged period. Long-term government bond yields are currently at historically low levels (figure 2.3).
Nominal wage inflation, which is closely related to underlying inflationary pressure, is lower than we would expect given tightness in the labour market. Our analysis suggests that persistent low nominal wage inflation partly reflects previously low CPI inflation. Low imported inflation has contributed to low CPI inflation, particularly between 2012 and 2016. This has supported real wage inflation (see chapter 3).

Low wage inflation may also reflect long-term labour market trends. For example, it could relate to technological improvements or increasing labour market flexibility. These explanations suggest nominal wage inflation will remain subdued relative to tightness in the labour market.

**GDP growth has slowed**

When setting monetary policy over recent years, our objective has been to stimulate GDP growth, build capacity pressure, and lift inflation to the 2 percent target mid-point. However, GDP growth has slowed over the past year. Annual GDP growth was 2.5 percent in the March 2019 quarter. This is below our estimate of potential growth in the New Zealand economy (figure 2.4). In addition, indicators of growth have remained weak or weakened further over the past few months.

**Weakening global conditions are contributing to the domestic slowdown**

Global economic conditions have weakened since mid-2018. Growth has slowed in some of our key trading-partner economies, especially China, Australia, and Europe (figure 2.5). Political and policy uncertainty is very elevated in several major economies. International trade has declined and growth in manufacturing production has slowed, while service sector activity has largely held up. Spillovers from trade disputes have resulted in widespread impacts across many economies.
Prices for many commodities have softened, although reduced supply has provided support for some. New Zealand’s terms of trade declined over 2018, weighing on domestic incomes and dampening growth in consumption and business investment. The terms of trade are expected to increase over the coming quarters, providing a boost to domestic spending. However, this increase partly reflects lower import prices, which put downward pressure on inflation.

A number of central banks have responded to the weakening economic outlook and low expected inflation by easing monetary policy. Financial market pricing indicates that market participants now expect policy settings to be much easier in the future than they expected late last year (figure 2.6). Long-term interest rates have fallen and financial conditions have eased. The New Zealand dollar Trade-Weighted Index (TWI) has been fairly stable since the start of 2018 as upward pressure from lower global interest rates has been offset by lower domestic interest rates and export prices.

House price inflation and business confidence are weak

Domestically, the housing market has softened over recent months, dampening the outlook for household spending (figure 2.7). House prices have declined in Auckland and increased more slowly in other regions. We expect this to dampen consumer demand, as changes in housing wealth affect spending decisions. Construction activity is expected to remain elevated, given the still high level of house prices and continued strong population growth. However, further falls in house prices could reduce construction activity.

Deteriorating business sentiment also appears to have adversely affected economic activity, and likely contributed to the decline in business investment over 2018. Survey measures suggest business
confident in the economic outlook has continued to decline in 2019. There are likely to be a number of factors causing this decline in confidence, including concerns about the global economy, domestic policy uncertainty, slowing domestic growth, and declining profit margins.

**Monetary and fiscal stimulus supports growth from late 2019**

With GDP growth and capacity pressure expected to be weaker in the near term, a material pick-up in GDP growth is necessary for inflation to increase to 2 percent and for employment to remain around its maximum sustainable level. More stimulatory monetary policy is needed to support this pick-up.

Monetary stimulus is expected to give impetus to growth from late 2019. Market interest rates have declined since the start of 2019. This supports consumption and investment, and keeps the New Zealand dollar exchange rate lower.

Fiscal policy is also expected to support growth. In particular, government consumption growth is projected to increase sharply from the second half of 2019.

**Growth pick-up supports employment and inflation**

As increased monetary and fiscal stimulus lifts GDP growth above potential, the labour market is expected to tighten and the unemployment rate to decrease (figure 2.8). We expect employment to remain around its maximum sustainable level over the projection period.
Weaker capacity pressure is expected to flow through into lower non-tradables inflation over the rest of 2019. However, non-tradables inflation is expected to rise from 2020 as capacity pressure begins to build and pricing behaviour becomes less subdued. CPI inflation is projected to return to 2 percent in 2021 (figure 2.9). Recent and planned minimum wage increases are expected to have relatively small effects on consumer price inflation as firms absorb most of the additional cost into their margins.

**Key assumptions and uncertainties**

The outlook for monetary policy is contingent on the key forecast assumptions outlined in table 2.1. There is considerable uncertainty around these assumptions, and they are updated as new information becomes available. The Summary Record of Meeting outlines the key uncertainties discussed by the Monetary Policy Committee that could affect the economy and shift the outlook for monetary policy.
### Table 2.1

<table>
<thead>
<tr>
<th>Overarching narrative</th>
<th>Key forecast assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global growth stabilises around its historical average</strong></td>
<td>GDP growth in our major trading partners averages 3.3 percent over the projection period. Monetary stimulus is assumed to support growth.</td>
</tr>
<tr>
<td><strong>Global inflationary pressure edges up only gradually</strong></td>
<td>Inflationary pressure in our major trading partners is weak over 2019, and edges up only gradually over the projection period. Import price inflation in foreign currency terms is low, averaging close to zero over the projection period. Dubai oil prices gradually decline to around USD 60 per barrel. Whole milk powder prices remain stable around USD 3,000 per metric tonne.</td>
</tr>
<tr>
<td><strong>New Zealand GDP growth picks up to above trend due to fiscal and monetary stimulus</strong></td>
<td>GDP growth remains soft over the middle of 2019, but later exceeds potential growth as fiscal and monetary stimulus increases. Annual net immigration of working-age people falls from 40,000 in 2018 to 28,000 in 2021, providing less support to growth over time. Household consumption growth slows as house price inflation remains low and net immigration declines. Growth in export volumes slows over 2019. Import volumes grow at a moderate pace, supported by a pick-up in domestic demand growth from late 2019. Government spending growth increases significantly over the next year, but eases over the medium term.</td>
</tr>
<tr>
<td><strong>Capacity pressure builds as demand growth outstrips supply</strong></td>
<td>Employment is currently near its maximum sustainable level and the output gap is close to zero. Labour force participation remains around its current level. The labour market softens slightly over 2019. Over the medium term, the unemployment rate declines to around 4 percent and the output gap rises slightly above zero.</td>
</tr>
<tr>
<td><strong>Inflation trends up to the 2 percent target mid-point</strong></td>
<td>Annual non-tradables inflation dips over 2019 but then increases gradually, as capacity pressure increases and the dampening effect of past low inflation slowly fades. Annual tradables inflation is zero over 2019, but recovers thereafter to just below-average levels. Annual wage inflation rises to around 2.5 percent in 2021, as the labour market tightens and the minimum wage rises. Minimum wage increases are mostly absorbed in firms’ margins and have a small impact on CPI inflation.</td>
</tr>
</tbody>
</table>
Box A

Statement of the MPC’s monetary policy strategy

The following statement summarises the MPC’s monetary policy strategy. The strategy outlines the overarching plan for achieving the objectives laid out in the Remit, summarising the key principles the MPC considers when setting monetary policy. We intend to include this in each Monetary Policy Statement and to update it as the MPC’s strategy evolves.

The MPC’s monetary policy strategy

The MPC’s monetary policy strategy is its overarching plan for how it will formulate monetary policy under different circumstances to achieve its objectives. It outlines a consistent approach for 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. 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 Reserve Bank’s flexible inflation targeting framework and the MPC’s monetary policy strategy reflect 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.

The MPC does not attempt to immediately return inflation and employment to target, 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 have only transitory effects on inflation.

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 to the 2 percent target mid-point, regardless of whether inflation is currently below or above target. 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.

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. Monetary policy and prudential policy are coordinated to ensure that changes in each policy are taken into account when setting the other.

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.
Implementation of strategy

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

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

2) Next, it deliberates about 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 change the OCR at the current meeting and how it will communicate the policy outlook.
Chapter 3
Special topics

Prior to each Statement, the MPC is provided with analysis of some topical issues that may influence the policy assessment.

Topics for the August Statement included:

1. How are weaker global conditions affecting New Zealand’s economy?

New Zealand is a small open economy, so global economic and financial market conditions have a large influence on our business cycle (figure 3.1). Over the past year, the global economy has moved from a phase of relative strength to one of relative weakness. We have reflected this shift in our forecasts for the domestic economy and our policy stance.

Although global conditions have weakened, most external forecasts are for the global economy to grow at around its historical average over the next few years. However, our domestic forecasts do not place much weight directly on forecasts of growth in our trading partners. We instead consider the various channels through which international developments affect New Zealand’s economy and adjust our forecasts accordingly.

2. What is driving low business investment?

3. Why has house price inflation been so weak?

4. Has low CPI inflation driven low nominal wage growth?

5. Has recent monetary policy easing passed through to bank lending rates?
At a high level, the key channels are trade, financial markets, and confidence/uncertainty (figure 3.2).1

**Trade channel**

Weaker global conditions often lead to lower prices for our exports and imports, and reduced tourist spending in New Zealand.

Currently, slowing growth in global demand is suppressing the outlook for import and export prices, despite idiosyncratic factors supporting prices for some of our export products. Lower export prices reduce domestic incomes and spending. Low import price inflation is expected to hold down tradables inflation, which in turn damps pricing behaviour and suppresses non-tradables inflation too.

We also forecast growth in exports of services to soften over 2019, as weaker global conditions reduce tourist spending. Growth in visitor arrivals has slowed over recent quarters, although capacity constraints in the tourism sector may have also limited further growth.

**Financial market channel**

New Zealand’s financial markets are integrated into the global financial system. As a result, weak global conditions can transmit to New Zealand via our financial markets.

Globally, policy interest rates are expected to fall over the coming year, as central banks respond to the weaker outlook for demand and inflation. This would typically place upward pressure on the New Zealand dollar,

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as returns on New Zealand dollar investments become relatively more attractive. However, expectations for lower New Zealand interest rates have dampened this effect.

In the past, changes in the cost of New Zealand banks’ offshore borrowing have been an important influence on the New Zealand economy, due to their effects on domestic lending rates. These funding costs tend to increase at times of heightened uncertainty and risk aversion in global financial markets.

Domestic long-term interest rates have moved lower as global long-term interest rates have fallen. The spread between banks’ offshore funding costs and benchmark interest rates has been broadly steady over the past few years, despite weaker global conditions.

**Confidence/uncertainty channel**

Global developments can also affect domestic confidence and uncertainty; however, this channel is difficult to measure. Slower world growth has dampened business investment by lowering export prices and the output gap. But business investment has been weaker than would be suggested by these factors alone.

Recent low business confidence, which may reflect global uncertainty, likely explains some of this additional weakness. We reflect this in our forecasts by projecting investment to respond sluggishly to the projected increase in the output gap over the forecast horizon.

2. **What is driving low business investment?**

Investment is an important factor supporting GDP growth in our projections. However, for several years business investment has been relatively low, with government and residential investment supporting investment overall (figure 3.3). This section investigates the drivers of low business investment.

![Figure 3.3 Investment (share of nominal GDP, s.a.)](source: Stats NZ, RBNZ estimates.)

Business investment has been weaker than capacity pressure in the economy would suggest. A higher output gap is typically associated with higher investment because it indicates that demand is higher relative to firms’ capacity to produce. As a result, firms may invest more to take
Weaker GDP growth since 2016 offers another explanation. With slower GDP growth, firms may expect demand for their products to grow more slowly in the future, and therefore be less willing to invest, even if there is a high degree of capacity pressure in the economy.

Structural changes in the economy have also played a role. Since the mid-1990s, the composition of the economy has shifted away from manufacturing and towards services production (figure 3.5). Services production is generally less capital intensive than manufacturing, so this transition has contributed to a decline in investment in plant, machinery, and equipment as a share of the economy.

We expect business investment to increase over the projection period as capacity pressure builds. However, this increase may be tempered by structural shifts and elevated global uncertainty. Total investment is expected to be supported by strong construction activity.

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advantage of demand. But despite capacity pressure in the economy, business investment has been subdued (figure 3.4).

Elevated global uncertainty may help explain this. When firms are uncertain about the future, they are typically more cautious about making significant investments. Global uncertainty is likely to be one driver of recent low business confidence, although domestic factors have played a role too. Combined, these factors have likely suppressed business investment in New Zealand.²

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3. Why has house price inflation been so weak?

House prices are a key driver of household spending. Recently, house price inflation has been weak, influencing our forecasts for household consumption and residential investment (see chapter 4).

House price inflation has been low despite falling mortgage interest rates in 2018 and early 2019 (see figure 4.8). Lower interest rates tend to support house prices by reducing the cost of financing home ownership. Because houses are long-term assets, longer-term mortgage rates, which have fallen the most, correlate best with house price movements.

Historically, falls in the five-year mortgage rate have been associated with stronger house price inflation over the subsequent year or two. We estimate that recent falls in interest rates supported house prices in the first half of 2019, but will have more impact in late 2019 and early 2020 (figure 3.6).

Given house price inflation was actually weak in early 2019, other factors must have had a dampening impact (see figure 2.7).

Tighter restrictions on non-resident purchases of residential property are likely to have suppressed house price inflation. However, ‘now or never’ purchases could have supported prices between the announcement and the final implementation of the restrictions in October 2018.

House price inflation appears to have slowed more in regions that had greater non-resident buyer activity, like Auckland and Queenstown, but the role of the restrictions in this is unclear (figure 3.7). Moreover, house price inflation in regions that had low non-resident participation also slowed in the June quarter 2019. Having been in place for nine months, the transitional impact of the restrictions may have largely run its course.

Slowing net immigration and strong house building may also be dampening house prices. Building does not appear to be outpacing population growth, consistent with recent elevated nationwide rent growth. However, current house prices should also be influenced by expectations of future demand and supply. Lower net immigration and strong building could be dampening expectations of future supply and demand pressures, weighing on current house prices.
Other factors will have also influenced the housing market. Government policies regarding rental properties may have contributed to subdued demand from property investors. Given that many of these policies were signalled some time ago, their impacts on prices may have already occurred. That said, the Government’s decision to not adopt a capital gains tax may provide a temporary boost to house price inflation in the second half of 2019, but we expect its impact on price growth will diminish after that.

Other potential influences on house prices include housing affordability constraints, which may have restrained house prices, and the easing of loan-to-value restrictions, which may have supported house price growth.

Overall, we think lower mortgage rates, the diminishing impact of the foreign buyer ban, and the ruling out of the capital gains tax will outweigh strong building and declining net immigration, supporting prices through the rest of 2019. This is consistent with a recent pick-up in the number of house sales, which tends to lead prices by up to three months.

Over the medium term, house price inflation is expected to remain relatively low as the support from lower mortgage rates fades (see chapter 4). The subdued trend for house price inflation weighs on consumption and residential investment over the projection period.

4. Has low CPI inflation driven low nominal wage growth?

Nominal wage inflation has been subdued since the global financial crisis (GFC), despite a steady economic recovery, a tightening labour market, and employment currently estimated to be near its maximum sustainable level. This section investigates the importance of CPI inflation for nominal wage inflation.  

Our analysis finds that low past actual and expected CPI inflation has contributed significantly to low nominal wage inflation since the GFC.

In this section we focus on the private sector Labour Cost Index, which measures the cost of labour for firms. It is adjusted for changes in productivity and is not affected by changes in the composition of jobs in the economy. It is not a measure of the pay received by workers, which has grown at a faster rate than the cost of labour to firms.
Employees may not have demanded higher nominal wage increases because prices were not increasing as fast as they had historically. In other words, while nominal wage inflation has been low, CPI inflation has been even lower. As a consequence, real wages have increased at a higher rate on average since the GFC than before (figure 3.9).

Growing real wages would normally be associated with higher overall real costs for firms. But the story is more complex.

From 2012 to 2016 import prices fell in New Zealand dollar terms. As imports make up a large share of production costs for some firms, this may have allowed firms to pay higher real wages. Consistent with this explanation, fewer firms reported rising input costs over this time.

Since 2017, import prices have risen in New Zealand dollar terms and more firms are reporting increasing costs. However, firms have not increased their selling prices by as much as their input costs have risen. This may reflect slower demand growth and increased competition.

While wage inflation reflects a range of factors, this analysis suggests that past low CPI inflation has been a significant driver of low nominal wage inflation in recent years. Firms have increased prices by less than nominal wage inflation would suggest. Despite this, wage inflation remains a significant indicator of inflationary pressures and, therefore,
the outlook for wage inflation is important for monetary policy. The impact of past low CPI inflation is likely to persist, but gradually diminishes over time as CPI inflation rises towards 2 percent.

5. Has recent monetary policy easing passed through to bank lending rates?

Bank lending to households and businesses is an important channel through which monetary policy affects the economy. Lower policy rates reduce banks’ funding costs which, in turn, lead to lower lending rates to households and businesses.

Since March 2019, financial markets have anticipated more accommodative monetary policy in New Zealand. In May, the Reserve Bank cut the OCR to 1.5 percent, reinforcing expectations of easier monetary policy. However, the cost of new bank funding has declined by less than the fall in market expectations for the OCR, as indicated by interest rates on overnight indexed swaps (OIS) (figure 3.10). This partial pass-through is consistent with the tightening and easing cycles between 2014 and 2016.

One driver of this partial pass-through is the prevalence of deposits in banks’ funding structures. Banks have not fully passed on the monetary policy easing to deposit rates, partly because many transactional deposits are non-interest-bearing or have interest rates that are close to zero. In contrast, wholesale funding costs have declined broadly in line with the decline in OCR expectations, consistent with historical experience.

Changes in OCR expectations and bank funding costs tend to flow through to interest rates on household and business loans. Business lending rates are hard to observe, as they are often tailored to the risk of each loan. Mortgage rates are more easily observable, and may be indicative of changes in interest rates on business and consumer loans.

Mortgage rates have fallen in recent months, particularly longer-term fixed rates, which are an important driver of housing demand and house price inflation (figure 3.11). The larger declines in longer-term rates are in line with larger declines in longer-term wholesale interest rates.

However, the majority of mortgage lending is on floating or fixed rates with terms up to two years, so these rates have a larger bearing on borrowers’ cash flows. We estimate the weighted average mortgage rate
on new loans to have fallen by around 25-30 basis points since March, roughly in line with the fall in bank funding costs when translated into an equivalent term.

Lower interest rates will take time to flow through to the rates paid on existing mortgages. Since March, the weighted average interest rate on outstanding mortgages has fallen by around seven basis points. Given that around half of outstanding fixed-rate mortgages are due to have their interest rates reset within the coming year, the average mortgage rate will likely decline further in the coming months.

Overall, recent monetary policy changes have been partially passed through to mortgage rates in the same manner as in recent history. Although banks have passed on changes in their funding costs to mortgage interest rates, actual and expected monetary easing has not fully passed through to bank funding costs.
Global conditions have continued to weaken since the May Statement, reducing the outlook for domestic activity and capacity pressure. Domestically, increased fiscal stimulus over the projection period partially offsets weakening global conditions. More monetary stimulus is needed to achieve our inflation and employment objectives (see chapter 2).

This chapter summarises the economic projections that underpin our policy assessment.

Global conditions have continued to weaken

• Global economic conditions have continued to weaken in 2019. The outlook for trading-partner growth has been revised lower, and risks are to the downside (figure 4.1).

• Global trade volumes have been declining, and growth in manufacturing production has slowed. Global uncertainty, particularly around trade disputes and political developments in Europe, has caused businesses worldwide to reduce or delay investment and production.

• In contrast, unemployment has remained low in most major economies.
Demand for New Zealand’s exports is slowing

- Slower growth in foreign demand is expected to weigh on domestic export volumes, particularly for services such as tourism (figure 4.2).
- The export price forecast has been revised down slightly due to falls in export commodity prices, such as those of dairy and forestry. Lower export incomes dampen domestic spending.
- Lower oil prices and subdued world inflation are expected to reduce import prices (figure 4.3).

Overseas central banks are increasing stimulus

- Due to the subdued outlook for global activity and inflation, many overseas central banks have eased monetary policy or have signalled that they are likely to ease in the coming year.
- The lower outlook for world policy rates has put upward pressure on the New Zealand dollar exchange rate, but has been broadly offset by the lower outlook for New Zealand interest rates and export prices.
- The New Zealand dollar TWI is assumed to remain around 73 over the projection period (figure 4.4).
Domestic GDP growth is expected to remain subdued in the near term

- Global economic conditions are expected to continue dampening domestic growth. Domestic business surveys suggest that growth momentum continued to slow into mid-2019.

- We have revised down our forecast for GDP growth through 2019 to reflect this (figure 4.5).

- Fiscal and monetary stimulus is expected to contribute to higher domestic GDP growth from late 2019.

Net immigration remains elevated but is expected to decline

- Net immigration has been declining since 2016, but remains elevated. We assume it declines to 28,000 working-age people annually by 2021 (figure 4.6).

- Net immigration is expected to contribute significantly to potential output growth over the projection period, but this contribution declines over time.
Lower mortgage rates are expected to support house prices

- House price inflation has continued to slow over the past year (figure 4.7).
- Recent declines in mortgage rates are expected to support house price inflation over the coming year (figure 4.8).
- Over the medium term, house price inflation remains modest as net immigration wanes and new housing construction remains high.

Note: The rates shown for each term are the average of the latest rates on offer from ANZ, ASB, BNZ, and Westpac.
Low house price inflation weighs on household consumption

- Household consumption growth has trended down since 2016 in line with weakening house price inflation and lower net immigration (figure 4.9).

- In the near term, consumption growth is slightly weaker than in the May Statement, reflecting weaker house price inflation. Lower interest rates support consumption growth from late 2019.

- Consumption growth is expected to continue declining gradually over the projection period as house price inflation remains subdued and net immigration trends lower.

Residential investment increases gradually

- Residential investment was strong in the March quarter of 2019 (figure 4.10). Elevated dwelling consent issuance suggests residential investment will rise further in the near term.

- Low house price inflation may temper further increases in residential investment towards the end of the projection period.

Figure 4.9
Household consumption growth (annual)

Figure 4.10
Residential investment (share of potential, s.a.)

Source: Stats NZ, RBNZ estimates.
**Business investment eases over the next year**

- Business investment rebounded in the March 2019 quarter, reflecting higher non-residential construction (figure 4.11).

- Global policy uncertainty and low business confidence are assumed to suppress business investment over the next year.

- Stronger GDP growth over 2020 is expected to encourage firms to increase investment, which should help sustain GDP growth over the latter part of the projection period.

- Lower export prices and a weaker near-term GDP growth outlook dampen business investment growth for longer than in the May Statement.

**Fiscal stimulus supports a lift in GDP growth**

- Government expenditure is higher over the projection period, consistent with the spending plans outlined in *Budget 2019* (figure 4.12).

- Growth in government consumption accelerates considerably from the second half of 2019, contributing significantly to domestic demand.

- We assume that additional fiscal spending translates less than one-for-one into domestic spending. This assumption reflects factors such as fiscal spending on imported goods and services.
**Capacity pressure is easing**

- With GDP growth slowing below potential growth, we estimate that capacity pressure has eased since the first half of 2018. The output gap is currently assumed to be around zero (figure 4.13).

- The output gap is expected to fall further in 2019 as GDP growth remains low.

- Capacity pressure begins to rise from 2020 as fiscal and monetary stimulus increases.

**Labour market projected to ease slightly before gaining momentum**

- Our suite of labour market indicators suggests that employment is currently near its maximum sustainable level (see table 5.1).

- We expect a slightly higher unemployment rate in the near term, consistent with subdued GDP growth (figure 4.14). The unemployment rate declines over the medium term as GDP growth increases.

- Employment growth is forecast to decline in the near term but to recover as labour demand increases (figure 4.15). The employment rate is expected to stabilise at a high level.

- We assume the labour force participation rate will remain high at around 71 percent over the projection period.
Wage inflation is expected to increase

- Nominal wage inflation remains low but has increased slightly since 2017, in line with higher wage expectations (figure 4.16).

- In the near term, we expect lower nominal wage inflation than in the May Statement, in line with lower CPI inflation and a more moderate labour market outlook over 2019.

- Over the medium term, rising wage inflation is driven by the tightening labour market and announced minimum wage increases.

- The increase in the minimum wage in April 2019 is assumed to lift non-tradables inflation slightly from the June quarter, providing some offset to the fall in capacity pressure.
CPI inflation returns to 2 percent in late 2021

- Measures of core inflation have increased over the past year. Easing capacity pressure and lower fuel prices are expected to see CPI inflation decline in the near term (figure 4.17).

- CPI inflation is projected to return to the 2 percent target mid-point by the end of 2021, slightly later than projected in the May Statement.

Capacity pressure lifts non-tradables inflation in the medium term

- We expect non-tradables inflation to dip slightly over the remainder of 2019 due to weaker capacity pressure (figure 4.18).

- As capacity pressure increases, non-tradables inflation increases to 3 percent by the end of the projection period.

- The dampening effect of past low inflation on price-setting behaviour is assumed to dissipate slowly over the projection period as headline inflation gradually increases.

- Higher minimum wages provide a slight boost to non-tradables inflation over the projection period.
Tradables inflation gradually increases

- Low global inflation and commodity prices have contributed to low tradables inflation since 2012 (figure 4.19).

- Tradables inflation is projected to converge gradually to slightly below its long-term average.

- Excluding fuel, tradables inflation slowly increases over the projection period. This reflects higher import costs in New Zealand dollar terms and higher domestic retailer costs being gradually passed through to consumer prices.

- Fuel price inflation is expected to be relatively subdued, consistent with our oil price and New Zealand dollar TWI assumptions.
# Chapter 5

## Appendices

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<th>Our recent research</th>
<th>MSE indicators</th>
<th>Chart pack</th>
<th>Statistical tables</th>
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RESERVE BANK OF NEW ZEALAND/MONETARY POLICY STATEMENT, AUGUST 2019
Appendix 1: Our recent research

This appendix summarises various streams of monetary policy-related research produced by Reserve Bank staff over the past six months. Research shapes our understanding of the New Zealand economy, and ultimately influences policy decisions. Our research is disseminated through several types of Bank publications including speeches, Bulletin articles, Analytical Notes, and Discussion Papers, as well as external publications such as academic journals and conference volumes.

Labour market and capacity pressure

Our Remit requires us to contribute to supporting maximum sustainable employment (MSE). Understanding various aspects of the New Zealand labour market and measuring the impact of labour market variables on capacity pressure and inflation are important dimensions of our research programme.

To get a better sense of where we may be heading, it pays to know where we have been. Dean Hyslop, Amy Rice, and Hayden Skilling take a historical perspective on the labour market in their Discussion Paper Understanding labour market developments in New Zealand, 1986-2017. They find that the increasing labour force participation rate in New Zealand’s labour market has been due to increased participation of older people and women.

The effectiveness of the monetary policy transmission mechanism depends crucially on how capacity pressure in the labour and goods markets generates inflation. In an Analytical Note, Evaluating indicators of labour market capacity in New Zealand, Finn Robinson, Jamie Culling, and Gael Price find that disaggregated measures of unemployment, under-utilisation, and labour market flows are particularly good measures of labour utilisation. This is due to their ability to forecast and explain employment growth, wage growth, and non-tradables inflation.

While the assessment of overall capacity pressure is an important determinant of monetary policy settings, capacity pressure is essentially unobservable. Moreover, the estimate of the output gap, a key measure of capacity pressure, tends to get revised substantially as new data points are incorporated. Hence, in the Analytical Note Suite as! Augmenting the Reserve Bank’s output gap indicator suite, Punnoose Jacob and Finn Robinson reiterate that it is appropriate to use a suite of indicators, rather than any single measure, to inform the Bank’s assessment of capacity pressures. They also augment our existing output gap indicator suite with new labour market measures that lend more stability to the Bank’s estimate of the output gap.

The formulation of monetary policy is a forward-looking exercise, and forecasting the future evolution of the New Zealand and global economies is a core function of our Economics department. While there is little doubt that forecasting the future is challenging, assessing the current state of the economy is also difficult due to data publication lags. Özer Karagedikli and Murat Özbilgin address the latter issue by employing state-of-the-art quantitative techniques in the Analytical Note Mixed in New Zealand: Nowcasting labour markets with MIDAS. They efficiently combine information from data that are available at daily, monthly, or quarterly time intervals (‘mixed-frequency’ data) to improve our real-time assessment of the state of the labour market.
Monetary policy framework

Amendments to New Zealand’s monetary policy framework came into effect on 1 April 2019. In the context of these changes, the Bank released a Monetary Policy Handbook documenting the way we think about the economy and monetary policy. We also published three Bulletin articles to support the Handbook.

With the introduction of the new framework, it was timely to take stock of the Bank’s monetary policy strategy – the overarching approach that guides policy setting across the range of economic circumstances and the trade-offs that can potentially arise. Julia Ratcliffe and Ross Kendall explain our strategy in Monetary policy strategy in New Zealand, discussing the underlying principles of effective strategy in the context of New Zealand’s dual mandate.

One of the key framework updates has been the move to a monetary policy committee structure for decision-making. In Effective monetary policy committee deliberation in New Zealand, Amber Wadsworth and Gael Price support the new decision-making process, by outlining the principles of clear objectives, diversity, and inclusion (of people and information) for the Committee.

In Monetary policy objectives – price stability and macro stabilisation, Omar Aziz and Christie Smith discuss the Bank’s policy objectives in a broader historical context, illustrating how the objectives of monetary policy have varied over time in response to pressing societal issues. They acknowledge that the Reserve Bank is only one of a number of key institutions shaping macroeconomic policy in New Zealand, and explain the sometimes significant interplay between monetary objectives and the macroeconomic objectives set for fiscal policy.

Global influences

New Zealand is a small open economy that can be significantly affected by economic developments in other countries. It is important that we understand the channels through which international developments can affect New Zealand, and are able to measure the magnitudes of the effects.

In the Bulletin article Opening the toolbox: how does the Reserve Bank analyse the world?, Michael Callaghan, Enzo Cassino, Tuğrul Vehbi, and Benjamin Wong summarise the Bank’s frameworks for modelling global influences, and discuss the transmission of global shocks to the New Zealand economy through three channels: trade, financial, and uncertainty or confidence.

The influence of international factors on the New Zealand economy also implies that forecasts for New Zealand macroeconomic variables need to account for external developments. Thomas van Florenstein Mulder and Tuğrul Vehbi, in the Analytical Note Forecasting with a Global VAR model, show that incorporating international variables using a Global Vector Autoregression (GVAR) model delivers more accurate forecasts of New Zealand GDP growth than those from the traditionally used professional economists’ forecasts provided by Consensus Economics. The GVAR is now an integral part of the Bank’s modelling toolkit for forecasting and scenario analysis.

Monetary policy transmission

Another strand of our research aims to deepen our understanding of the effects of monetary policy on the real economy, as well as features of the economy that may support or constrain the transmission mechanism.
The OCR has been declining since 2015. It is important that changes in the OCR are transmitted to interest rates across the yield curve, and ultimately the market rates that New Zealanders face. Michael Callaghan, Jamie Culling, and Adam Richardson construct a summary measure of monetary stimulus from the yield curve in their Analytical Note Effective Monetary Stimulus: Measuring the stance of monetary policy in New Zealand. This measure validates that monetary policy settings have been stimulatory for about five years. Furthermore, in addition to the stimulus provided by the OCR, the Bank’s forward guidance on future monetary policy settings has helped influence interest rates across the yield curve.

The Phillips curve – the statistical relationship between measures of inflation and economic activity – is an important consideration for monetary policy. Punnoose Jacob and Thomas van Florenstein Mulder examine this relationship in the Analytical Note The flattening of the Phillips curve: Rounding up the suspects. They demonstrate that the apparent weakening of the correlation between inflation and activity in New Zealand does not necessarily imply that price-setting firms are less responsive to demand pressures. Instead, the authors find that the relationship may be highly influenced by the increased variability of business cycle disturbances on the supply side of the economy.

Changes in monetary policy can affect house prices, which flow on to consumption and ultimately inflation. Fang Yao and co-authors find a causal link between house prices and consumption growth in New Zealand in the Discussion Paper Household leverage and asymmetric housing wealth effects – evidence from New Zealand. They also find that declines in housing wealth have a stronger effect on consumption than increases in housing wealth.

External publications

Our monetary policy framework is also informed by new developments in economic thought and best-practice modelling techniques. To this end, we maintain robust ties with academia, other central banks, and supra-national organisations, and our staff regularly publish their work in domestic and international peer-reviewed journals and conference volumes.

Punnoose Jacob; Lenno Uusküla

Jed Armstrong; Hayden Skilling; Fang Yao

Adam Richardson; Thomas van Florenstein Mulder; Tugrul Vehbi

Dean Hyslop; Amy Rice
Speeches

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

The evolving Reserve Bank – the view from Tāne Māhuta
Speech – 11 July 2019
Governor Adrian Orr outlines the Bank’s vision to be ‘a great team and the best central bank’, and also reflects on the Government’s review of the Reserve Bank Act.

Macroprudential policy: past, present and future
Speech – 01 July 2019
Deputy Governor Geoff Bascand explains the Bank’s refreshed strategy for using macroprudential policy tools such as the loan-to-value ratio and discusses how these tools may be set in the future.

Renewing the RBNZ’s approach to financial stability
Speech – 26 June 2019
Deputy Governor Geoff Bascand sets out the Reserve Bank’s approach to financial stability, and how its regulatory and supervisory regimes fit together. He also discusses the Government’s ‘in-principle’ decisions on the review of the Reserve Bank Act.

Maintaining credibility in times of change
Speech – 05 June 2019
Assistant Governor and General Manager Christian Hawkesby explains the importance of good decision-making and governance in achieving the long-term goal of improving wellbeing. He also discusses the Bank’s new Monetary Policy Committee decision-making structure, as well as the possibility of coordinating monetary and fiscal policies.

In service to society: New Zealand’s revised monetary policy framework and the imperative for institutional change
Speech – 29 March 2019
Governor Adrian Orr explains how the new monetary policy process and the Reserve Bank’s reviews and public consultations will bring greater transparency and accountability.

Safer banks for greater wellbeing
Speech – 26 February 2019
Deputy Governor Geoff Bascand explains the Reserve Bank’s proposal to increase minimum capital requirements for banks.
## Appendix 2: Maximum sustainable employment indicators

### Table 5.1
**Summary of indicators of employment and maximum sustainable employment (MSE)**

<table>
<thead>
<tr>
<th>Indicator type</th>
<th>Employment below MSE</th>
<th>Employment at MSE</th>
<th>Employment above MSE</th>
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<tr>
<td><strong>Indicator suite</strong></td>
<td>• Unemployment rate gap (reduced-form model)</td>
<td>• LUCIL</td>
<td>• Hours worked gap</td>
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<tr>
<td></td>
<td>• Employment rate gap (filled jobs)</td>
<td>• Unemployment rate gap (structural model)</td>
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<tr>
<td></td>
<td>• LUCIL</td>
<td>• Employment rate gap</td>
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<tr>
<td></td>
<td>• NAIRU</td>
<td>• Medium-term unemployment</td>
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<td><strong>Unemployment</strong></td>
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<td>• Youth unemployment (20-24 years)</td>
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<td></td>
<td>• Underemployment rate</td>
<td>• Māori and Pacific unemployment</td>
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<tr>
<td></td>
<td>• Underutilisation rate</td>
<td>• Underutilisation rate</td>
<td></td>
</tr>
<tr>
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<td>• Difficulty finding labour (QSBO)</td>
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<tr>
<td></td>
<td>• Job-finding rate</td>
<td>• Labour as limiting factor (QSBO)</td>
<td></td>
</tr>
<tr>
<td><strong>Flows data</strong></td>
<td>• Job-finding rate</td>
<td>• Job-separation rate</td>
<td></td>
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</table>

- LUCIL is the Labour Utilisation Composite Index in Levels – a principal component of a range of labour market variables.
- NAIRU stands for Non-Accelerating Inflation Rate of Unemployment.
- The job-finding rate is the probability of an unemployed person finding a job in a given quarter. The job-separation rate is the probability of an employed person losing their job in a given quarter. These rates have been adjusted to account for flows in and out of the labour force.
- QSBO stands for Quarterly Survey of Business Opinion.
Appendix 3: Chart pack

**Figure 5.1**
Composition of CPI inflation (annual)

- Headline
- Non-tradables
- Tradables

Source: Stats NZ, RBNZ estimates.

**Figure 5.2**
Output gap and labour/non-labour output gap indicator suite (share of potential)

- Output gap
- Labour (mean)
- Non-labour (mean)

Source: RBNZ estimates.

Note: Shaded areas indicate the range between the maximum and minimum values of labour and non-labour indicators in the output gap indicator suite.
Figure 5.3
Unemployment rate and NAIRUs (s.a.)

Source: Stats NZ, RBNZ estimates.

Note: NAIRU stands for 'Non-Accelerating Inflation Rate of Unemployment'. Shaded area indicates the range between the maximum and minimum values from different NAIRU estimates.

Figure 5.4
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 5.5
Composition of potential output growth (annual)

Source: RBNZ estimates.

Figure 5.6
Headline inflation and core inflation (annual)

Source: Stats NZ, RBNZ estimates.

Note: Core inflation measures exclude the GST increase in 2010.
Figure 5.7
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 5.8
Private sector wage growth
(annual)

Source: Stats NZ, RBNZ estimates.

Note: Real QES average hourly earnings is deflated with headline CPI inflation.

Figure 5.9
House price inflation
(annual)

Source: REINZ.

Figure 5.10
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 5.11
New Zealand dollar exchange rates

Source: Reuters, RBNZ estimates.

Figure 5.12
Terms of trade, dairy and oil price indices

Source: Stats NZ, GlobalDairyTrade, Reuters, RBNZ estimates.
### Appendix 4: Statistical tables

#### Table 5.2
**Key forecast variables**

<table>
<thead>
<tr>
<th>Year</th>
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<th>CPI inflation Quarterly</th>
<th>CPI inflation Annual</th>
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### Table 5.3

**Measures of inflation, inflation expectations, and asset prices**

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<th>2017</th>
<th>2018</th>
<th>2019</th>
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<td></td>
<td>Dec</td>
<td>Mar</td>
<td>Jun</td>
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<tr>
<td><strong>Inflation (annual rates)</strong></td>
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<td>CPI</td>
<td>1.6</td>
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<td>Sectoral factor model estimate of core inflation</td>
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<td>CPI trimmed mean (30 percent)</td>
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<td>ANZ Business Outlook – inflation one year ahead (quarterly average to date)</td>
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<td><strong>Asset prices (annual percent changes)</strong></td>
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<td>Quarterly house price index (CoreLogic NZ)</td>
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<td>REINZ Farm Price Index (quarterly average to date)</td>
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<td>NZX 50 (quarterly average to date)</td>
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<td>17.5</td>
<td>16.8</td>
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\(^1\) Long-run expectations are extracted from a range of surveys using a Nelson-Siegel model. Source: ANZ Bank, Aon Consulting, Consensus Economics, RBNZ estimates.
### Table 5.4
**Measures of labour market conditions**
*(seasonally adjusted, changes expressed in annual percent terms)*

<table>
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<th>Measure of Labour Market Conditions</th>
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<th>2019</th>
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<td>Unemployment rate</td>
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<td>Underutilisation rate</td>
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<td>Labour force participation rate</td>
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<td>Employment rate (percentage of working-age population)</td>
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<td>67.8</td>
<td>68.2</td>
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<td>Employment growth</td>
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<td>Average weekly hours worked</td>
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<td>Number unemployed (thousand people)</td>
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<td>120</td>
<td>122</td>
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<td>Number employed (million people)</td>
<td>2.60</td>
<td>2.62</td>
<td>2.63</td>
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<td>Labour force (million people)</td>
<td>2.72</td>
<td>2.74</td>
<td>2.76</td>
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<tr>
<td>Extended labour force (million people)</td>
<td>2.82</td>
<td>2.85</td>
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<td>Working-age population (million people)</td>
<td>3.84</td>
<td>3.87</td>
<td>3.88</td>
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| **Quarterly Employment Survey**     |      |      |      |
| Filled jobs growth                  | 1.8  | 1.2  | 1.3  |
| Average hourly earnings growth      | 3.1  | 3.9  | 3.6  |

| **Other data sources**              |      |      |      |
| Labour Cost Index growth, private sector | 1.9  | 1.9  | 2.0  |
| Labour Cost Index growth, private sector, unadjusted | 3.6  | 3.5  | 3.5  |
| Estimated net migration (published, thousands, quarterly) | 9.2  | 9.9  | 9.6  |
| Change in All Vacancies Index       | 6.7  | 5.4  | 6.7  |

**Note:** The All Vacancies Index is produced by the Ministry of Business, Innovation and Employment as part of the Jobs Online report, which shows changes in job vacancies advertised by businesses on several internet job boards. The unadjusted Labour Cost Index (LCI) is an analytical index that reflects quality changes in addition to price changes (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 and recent outturns are subject to large revisions.
Table 5.5
Composition of real GDP growth
(annual average percent change, seasonally adjusted, unless specified otherwise)

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<td>7.9</td>
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1 Percentage point contribution to the growth rate of GDP.
### Table 5.6
**Summary of economic projections**
*(annual percent change, unless specified otherwise)*

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<td>Import prices (in New Zealand dollars)</td>
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<td>3.6</td>
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<td>2.7</td>
<td>2.4</td>
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<td>2.6</td>
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<td>3.1</td>
<td>3.1</td>
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<td>2.9</td>
<td>2.7</td>
<td>2.6</td>
<td>2.5</td>
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<td>Output gap (% of potential GDP, year average)</td>
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<td>-1.5</td>
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<td>Total employment (seasonally adjusted)</td>
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<td>1.7</td>
<td>1.8</td>
<td>1.4</td>
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<td>Unemployment rate (March qtr, seasonally adjusted)</td>
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<td>5.7</td>
<td>5.6</td>
<td>5.5</td>
<td>5.3</td>
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<td>Government operating balance (% of GDP, year to June)</td>
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