

February 2018

## Executive Summary

- ▶ **The unemployment rate fell to 4.5% in December, and wage measures were mixed, with annual Quarterly Employment Survey (QES) growth of 3.1%, but Labour Cost Index (LCI) growth unchanged at 1.8%**
- ▶ **House prices and sales volumes both increased in January**
- ▶ **Consumption indicators were positive: for the December quarter retail sales volumes rose 1.7% (sa), and in January electronic cards spending rose 1.4% (sa)**
- ▶ **Global 10-year bond yields pushed higher in February as analysts expect a faster pace of tightening of monetary policy in 2018**
- ▶ **Special topic covers estimation of the Natural Rate of Unemployment**

Labour market data showed solid growth in the December quarter and perhaps slightly more tightness than we expected. The labour force expanded by 9,000 people, as the number in employment grew and the number of unemployed fell, which led to a fall in the unemployment rate from 4.6% to 4.5%. Wage growth measures were mixed; QES ordinary time hourly earnings increased 1.0% in the quarter taking annual growth to 3.1%, but annual growth in the ordinary time LCI was 1.8% for all sectors combined.

We expected annual net Permanent and Long-term (PLT) migration to continue falling but it increased slightly to 70,147 in January. High migration has been a key driver of population growth, with the working age population growing by 18,000 people in the December quarter, but the increase in the labour force, driven by steady employment growth, meant only a slight dip in the participation rate to 71.0%. Productivity statistics for the year to March 2017 included revisions that showed higher productivity over the past few years than previously estimated.

House prices and sales both rose slightly in the January month, recovering from falls earlier last year. Building consents fell in December, but have been quite volatile over recent months. Consents fell for the December quarter as a whole, which we expect to mean residential investment will be flat at the start of 2018.

Consumption indicators released this month were positive. For the December quarter, total retail sales volumes rose by 1.7%, posing some upside risk to our December consumption forecast. For the January month, electronic card spending rose by 1.4% (sa), and there were solid increases in both the January ANZ-Roy Morgan consumer confidence index and the February ANZ business confidence index. The recovery in the housing market could be contributing to solid consumption, particularly with durables spending increasing in line with the pick-up in house sales. The outlook for consumption is solid with annual average growth of between 3.5% and 4.0% expected over the coming year.

On a seasonally adjusted basis, the goods trade balance deteriorated from a surplus of \$200 million in December to a deficit of around \$500 million in January. Export values fell 14.7% (following a similar sized rise in December) and imports fell 0.3% (following a 4.7% dip in December).

In the US, strong economic data, combined with increased fiscal stimulus has raised expectations of the pace of tightening of monetary policy in the US in 2018. This drove a temporary fall in equity prices early in the month and a sustained lift in global 10-year bond yields.

## Analysis

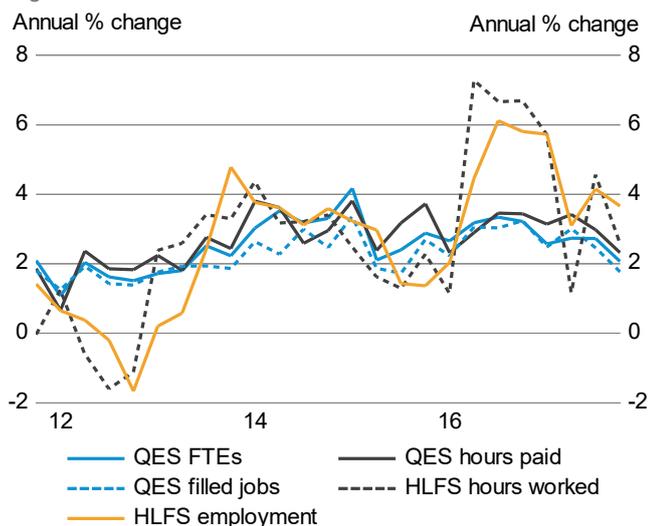
Labour market data showed solid growth and the unemployment rate fell from 4.6% to 4.5%. There was a slight increase in both the New Zealand HPI and sales in January. Indicators for consumption were solid, with December quarter retail sales volumes up 1.7% (sa), and January electronic cards spending up 1.4% (sa). Consumer confidence for January and business confidence for February rebounded after a dip at the end of 2017.

### Employment improved...

According to the HLFS, the working age population increased by 0.5% (18,000 people) in December, boosted by high migration. The labour force expanded by 0.3% (9,000 people), which led to slight dip in the participation rate to 71.0%. The total number of people in employment rose by 12,000 (0.5%) in the December 2017 quarter, with an increase in full-time (0.6%) and a decrease in part-time (-0.2%) employment. Annual growth was 3.7% (Figure 1), down from 4.2% in September.

Other measures of labour demand were softer. HLFS total actual hours worked each week fell 0.6% in the quarter (2.6% higher than a year ago). The QES measures were also fairly muted - hours paid each week increased by 0.4% (2.3% from last year), the number of full-time equivalent employees increased 0.2% (2.1% from last year), and the number of filled jobs rose 0.3% (1.8% from last year).

Figure 1: Measures of labour demand



Note: HLFS growth rates are affected by a potential series break in 2016Q2

Source: Statistics NZ

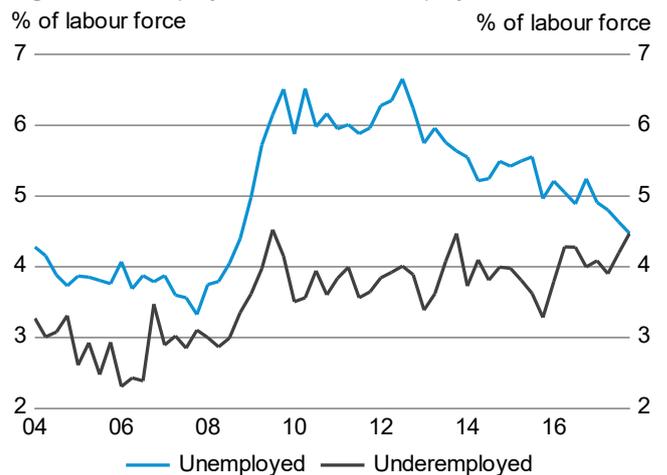
### ...leading to a fall in unemployment...

The number of unemployed fell by 3.2% (4,000 people) to 122,000, and with the increase in the labour force from reasonable employment growth, the unemployment rate fell from 4.6% to 4.5% (Figure 2). This was slightly lower than the Treasury's and market expectations. For more on the unemployment rate and the non-accelerating inflation rate of unemployment (NAIRU), see the special topic.

### ...but underutilisation increased

There was a 7.0% (sa) increase in the number of underemployed, those working part-time who want to work more hours and are available. This offset the fall in unemployed to leave the underutilisation rate at 12.1%, slightly higher than it was in September. The unemployment rate (unemployed as a share of the labour force) has been decreasing since 2012, but underemployed as a share of the labour force has been stable at around 4%. This indicates there is still some spare capacity in the labour market.

Figure 2: Unemployment and underemployment



Source: Statistics NZ

### Wage growth measures mixed

QES ordinary time hourly earnings increased 1.0% in the quarter taking annual growth to 3.1%, from 2.2% in September. Combining hourly earnings with the increase in hours worked, total weekly gross earnings rose 5.5% in the year.

Annual growth in the ordinary time Labour Cost Index (LCI), which measures changes in wages and salaries for a fixed quantity and quality of labour (ie, approximates unit labour costs), was 1.8% for all sectors combined, the same as September.

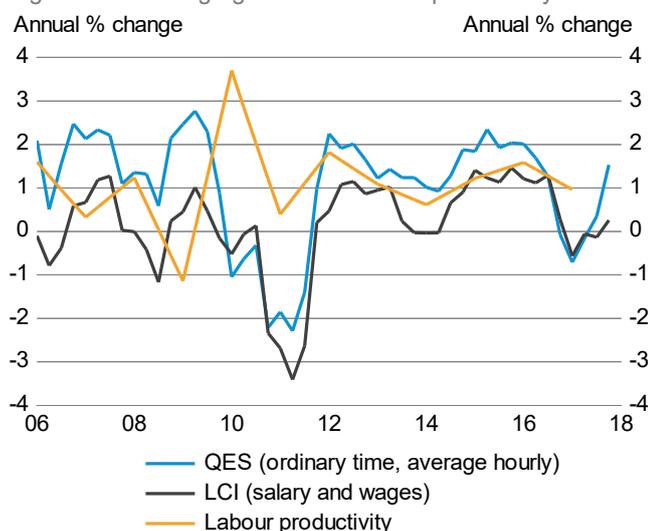
## Productivity growth revised higher

Productivity statistics were released for the year to March 2017. The annual productivity statistics estimate productivity for the 'measured sectors', for which separate output and input measures can be estimated independently. Measured sector output expanded by 3.8% to March 2017, reflecting strong labour and capital input growth. As a result, it is estimated that multifactor productivity (MFP) grew 1.0%, with labour productivity up 0.9% and capital productivity up 1.1%.

The revisions to GDP data late last year resulted in measured sector output being revised up and labour inputs revised down. This saw upward revisions to productivity growth over the past four years, particularly for the year ended March 2016 where annual growth was previously thought to be -0.4% and was revised to 1.5%.

Labour productivity growth of 0.9% for the year ended March 2017 reinforced how weak real wage inflation was at the start of 2017 (Figure 3), when real wages actually fell. Since then, real wage growth has improved, in part owing to the weaker than expected CPI inflation, however it remains subdued on an LCI basis.

Figure 3: Real wage growth and labour productivity



Note: real wages deflated by Consumers Price Index inflation

Source: Statistics NZ

## Labour market outlook

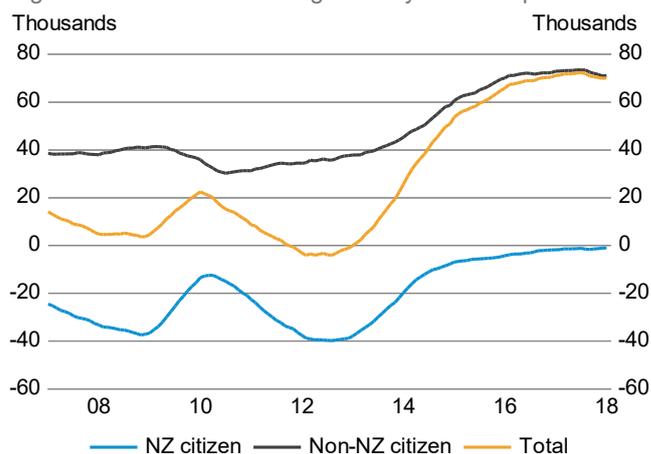
Overall, with employment growth of 0.5%, the data suggest the labour market is slightly tighter than anticipated. That said, the fall in hours worked, and stable share of underemployed indicate that there is some spare capacity.

Looking ahead, we expect annual economic growth to remain around 3% over the coming year will drive continued employment growth. We expect this to be matched by growth in labour supply, which migration continues to increase, even if it has started to come off its peak. This should lead to a broadly flat unemployment rate over the year ahead. We expect steady productivity growth and increasing labour market tightness to continue supporting annual QES wage inflation of around 3%.

## Migration holds up

Net permanent and long-term (PLT) migration increased in January to 6,210 (sa), from 5,780 last month. On an annual basis, net PLT migration also rose slightly to 70,147 (Figure 4), going against our expectation of a continued decline. Departures by non-New Zealand citizens have been driving the fall from last year's peak, and increased again this month on an annual basis. However, the small net outflow of New Zealand citizens has kept net PLT high, and fell to only 993 people in January on an annual basis, the smallest annual net outflow since 1983.

Figure 4: Annual net PLT migration by citizenship



Source: Statistics NZ

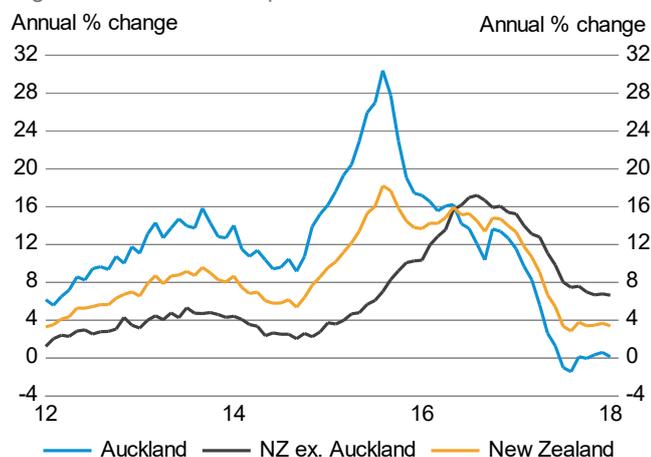
We still expect net PLT to fall, driven in the near-term by increasing departures from non-New Zealand citizens, as those who have arrived over the past few years on temporary visas start to leave, and over the longer run by net New Zealand flows returning to more typical levels.

## House sales and prices steady...

For New Zealand, the rate of house price inflation slowed in the first half of last year, and in Auckland, prices actually fell; by July 2017, the Auckland House Price Index (HPI) was 3.3% lower than it was in January 2017. Since July 2017, prices edged higher and have now fully recovered in Auckland. Towards the end of 2017, monthly growth averaged around 0.7% in both Auckland and the rest of New Zealand, which would translate to annual growth of around 8%

if it were to be sustained. The increase in the New Zealand HPI in January 2018 was more modest, up by 0.3% (sa), but the January outturns can be volatile because there are relatively few house sales. Compared against last year, the New Zealand HPI rose 3.5% (Figure 5), with New Zealand excluding Auckland up 6.7% and Auckland up 0.2%.

Figure 5: Annual house price inflation



Source: REINZ

It is likely the recent monthly increases in the HPI represent a recovery from last year's weakness, rather than a sign of renewed strength; however, we will pay close attention to the next few months, and migration remaining high adds further pressure. We expect annual house price inflation to stay around 4-5% over the next year.

In September last year, seasonally adjusted monthly house sales were the lowest since August 2014. Sales have since rebounded and rose 3.5% in January 2018 to be up 2.7% from January last year.

### ...but consents up and down

Building consents fell 9.6% (sa) in December after increasing by a similar amount the previous month. For the December quarter, consents fell 4.8%, after increasing 5.2% the previous quarter. Most of the growth in consents over the past two years has come from multi-unit dwellings, which are more volatile on a monthly basis, and overall there is still an upwards trend to consent. However, there are signs of stretched capacity constraining growth, particularly from high construction costs. The capital goods price index rose 0.8% in the December quarter, driven by both residential and non-residential construction increasing 1.3%.

The main component of residential investment is construction activity, and December's consents outturn suggests that it will be fairly flat at the start of 2018. However, residential investment also includes the transfer costs associated with buying and selling homes, which will be supported by the pick-up in

house sales. We therefore expect reasonable growth in residential investment in the December quarter.

### Retail sales strong in December...

Total retail sales volumes rose by 1.7% in the December 2017 quarter. Increases were relatively broad based, with strong increases in clothing (up 4.0%), and food and beverage services (up 3.7%), which rebounded from a 2.6% fall in the September quarter. Accommodation fell by most, down 2.3%, after falling 5.1% the previous quarter. Core retail sales volumes, which excludes the volatile fuel and car components, rose 1.8%.

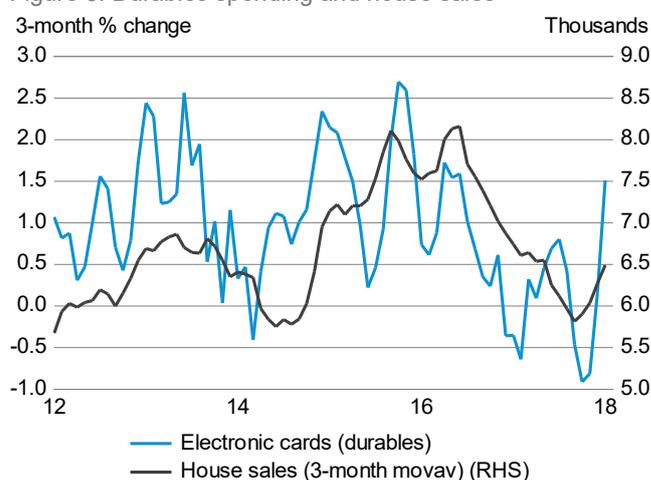
The total value of retail sales rose 1.9%, driven again by food and beverage services (4.1%), and supermarket and grocery stores (1.5%). Core retail sales values increased 1.8%, identical to the growth in core retail sales volumes, indicating little price movement – an expected result given weak Consumer Price Index inflation in December.

In the National Accounts, consumption includes what New Zealanders spend abroad, and removes what visitors spend in New Zealand, which is treated as an export. The amount spent by visitors was as expected in December, meaning the strong retail sales outturn poses some upside risk to our consumption forecast for the quarter.

### ...and electronic cards sales started 2018 well

Total electronic card spending increased 1.4% (sa) in January. Total core retail rose 1.0%, driven by hospitality and durables, up 1.5% and 1.2% respectively. The past few months has seen a recovery in the housing market, particularly of house sales, which could partly explain the strong increase in durables spending. Durables spending was 1.5% higher in the past three months compared to the three months prior (Figure 6).

Figure 6: Durables spending and house sales



Source: REINZ, Statistics NZ

The ANZ-Roy Morgan consumer confidence index increased 5.1 points to 126.9 in January, rebounding after dipping towards the end of last year. House price inflation expectations also increased, but were still well below the highs of mid-2016. The February ANZ business confidence index also moved in a positive direction, showing a net 19% of businesses are pessimistic about the year ahead, from 38% in December. These results suggest the fall was temporary and perhaps related to uncertainty around government formation.

The January electronic cards outturn, despite being strong, is consistent with our view that annual average growth in private consumption has peaked. However, the improving confidence measures provide support for our expectation that strong population growth, matched with employment and wage growth should keep annual average growth in real consumption between 3.5% and 4.0% over the coming year.

## Trade

On a seasonally adjusted basis, the goods trade balance deteriorated from a surplus of \$200 million in December to a deficit of around \$500 million in January. Export values fell 14.7% (following a similar sized rise in December) and imports fell 0.3% (following a 4.7% dip in December).

The decline in exports was largely volume driven, with volumes down for all measured Harmonised System (HS) categories – the largest being forestry, down 29.7%. Dairy volumes fell 4.2%, and we expect further falls given the dry weather and weak milk production in both December and January. Weak milk production also supported solid prices in February's GDT auctions, with prices up 12.8% from their most recent low point in mid-December. The ANZ commodity price index rose 0.7% in the month of January.

The annual overseas merchandise trade deficit widened \$340 million from December to \$3.2 billion, with annual exports up 0.7% (\$0.4 billion) to \$54.0 billion and annual imports up 1.3% (\$0.7 billion) to \$57.2 billion.

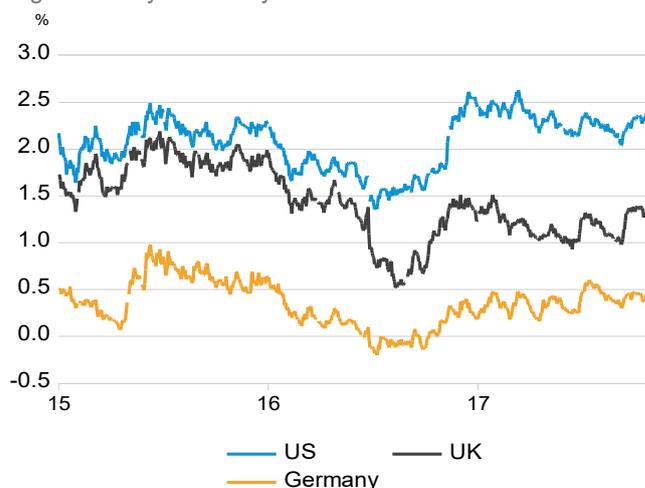
In part, some of the weakness in January exports reflects a bit of a retracement from a strong end to 2017, while some reflects the initial impact of dry weather conditions in late 2017.

## Global bond yields on the rise...

Early in February, strong employment data helped push US 10-year Treasury yields to a 4-year high of 2.84%. This sparked a sell-off in equities globally with the US stock market having its worst day in two years. The fall in equities has proved to be largely transitory with subsequent gains recovering most of the lost

ground, although bond yields have generally remained elevated, with the 10-year Treasury yield currently around 2.9%, up considerably from a low in September 2017 of 2.0% (Figure 7).

Figure 7: 10-year bond yields rise in advanced economies



Source: Haver

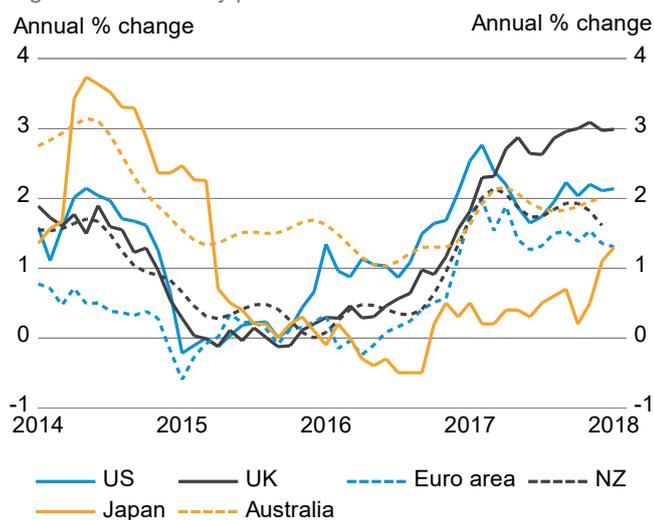
The higher yields largely reflected ongoing strength in a number of indicators over the month that fuelled the view that the global economy is growing quite quickly and monetary policy accommodation could be removed faster than had been anticipated. US Treasury yields were also buoyed by the announcement that the US Senate had agreed a deal funding the government for two years and raised the debt ceiling (more details below). Similarly, German bunds were likely supported by reports of a coalition deal in Germany, although this is still to be confirmed.

## ...with strong economic data in the US...

The January US employment report showed a solid non-farm payrolls rise of 200K, and substantial revisions to past quarters. The bigger surprise was the 2.9% rise in average hourly earnings, well above expectations. The unemployment rate was steady at 4.1%.

CPI data for January showed prices rose 0.5% in the month, leaving annual inflation unchanged at 2.1%, in contrast to an expected dip (Figure 8). More importantly for markets, monthly core inflation rose by, a more than expected, 0.3%, leaving annual core inflation at 1.8%.

Figure 8: Inflationary pressures stale



Source: Haver

Business sentiment in the US continues to come in strong with both the Markit services PMI and the Markit manufacturing PMI rising to 55.9 in February (from 53.3 and 55.5 respectively). The US non-manufacturing ISM rose 3.9pts to 59.9, above even the most optimistic forecast, to its highest level since 2005. The Consumer Board Consumer confidence index increased to 130.8 in February from 124.3 reaching the highest level in more than 15 years (Figure 10).

...and more fiscal stimulus...

The US Congress ended a brief (six hour) government shutdown by passing a 2-year spending bill. The bill increases government spending by providing around \$300 billion for infrastructure, military spending and domestic programmes. Most analysts expect the increased spending will significantly boost growth over the next two years, and put further pressure on inflation and interest rates.

...adding to monetary policy expectations

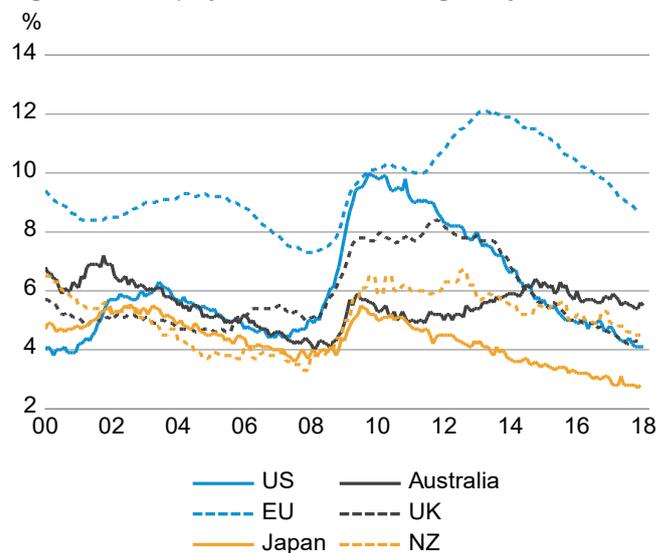
The minutes from the Federal Reserve Open Market Committee's (FOMC) January meeting were in line with most analysts' expectations highlighting the growing economic momentum supporting the outlook for inflation. The next meeting of the Federal Reserve is in March and will be the first chaired by Jerome Powell. In a recent testimony to congress Powell noted that "some of the headwinds the U.S. economy faced in previous years have turned into tailwinds." The testimony was interpreted by analysts as fairly hawkish, suggesting Powell may push to raise interest rates faster than the previous chair Janet Yellen.

Market expectations of US monetary tightening in 2018 have increased by almost 20 basis points over February, with just over three interest rate increases now priced in. Given the strength of the economic data and the expected impact of fiscal stimulus, we now see the balance of risks tilted to the upside with our current pick for four interest rates increases by March 2019. Analysts will be watching the Fed's 'dot plot' in March to see an update of the committee members' forecasts.

Australian wages begin to pick up

In Australia, labour market data for January showed a fall in the unemployment rate to 5.5% from a revised 5.6% in December (figure 9). However, the details showed the gains in employment were in part-time employment (+66k), while full-time employment fell (-50k). The lower unemployment rate was also helped by a fall in the participation rate to 65.6% from 65.7% in December.

Figure 9: Unemployment on the decline globally



Source: Haver

The wage price index for the December quarter showed that wages increased 0.6% in the quarter, up from 0.5% in the September quarter and bringing the annual change to 2.1%. Most of the wage growth was driven by public sector wages, while private sector wage growth remained subdued. However, the gradual increase in wage growth over the last year appears to be the end of roughly four years of falling wage growth. Looking forward, we see the gradual improvement in employment and wage growth continuing, eventually adding to pressure on inflation interest rates.

The RBA kept rates on hold, as expected, with the Governor noting in a later speech, that the growth outlook had changed little since November. Market expectations suggest no interest rate increases in the next twelve months.

### Soft economic outlook in the UK

In the UK, the economic outlook is softening with higher unemployment and lower growth. Labour market data showed a fall in employment in December, which drove the unemployment rate up to 4.4%, from 4.3% in November.

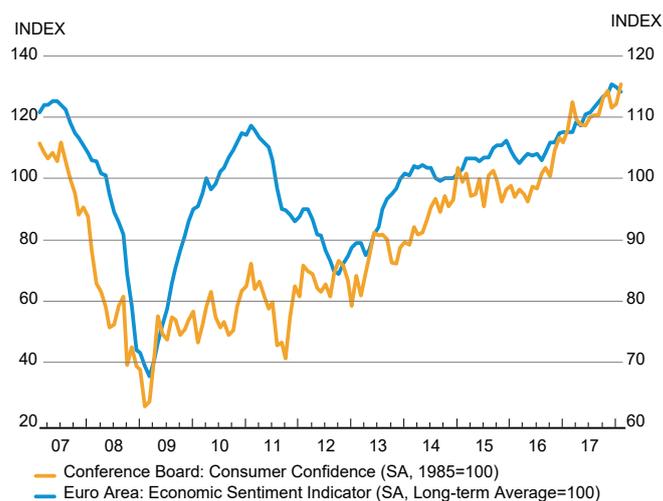
The latest estimate of UK GDP in the December quarter revised annual growth down to 1.4%, compared with 1.8% in the September quarter. One factor contributing to lower GDP growth is the weakness in business investment, with some businesses perhaps delaying investment in the face of an uncertain outlook.

Despite the weak economic data, 10-year bond yields in the UK have largely matched those of other advanced economies and have risen notably in recent months. This largely reflects the tension between the UK's real economic outlook and persistently high rates of inflation. Mark Carney, Governor of the Bank of England, has recently highlighted the recent pick-up in wage inflation in the UK "*the long-awaited pickup in wages is starting to take root*", a condition that he had previously noted as a pre-requisite to further monetary tightening.

### Sentiment in the euro area softens but remains at historic highs

In the euro area, GDP data showed the economy grew by 0.6% in the December quarter, bringing annual growth to 2.7%, down slightly from 2.8% in the September quarter.

Figure 10: European confidence continues to shoot off



Source: Haver

Both the services and manufacturing Market PMIs fell by 1.3 points in Europe in February (to 56.7 and 58.5 respectively). Both indicators remain well above historical averages. Economic confidence fell slightly to 114.1 in February, from 114.9 in January. However the level remains around the highest seen in the last decade (figure 10).

### ...China

PMIs in China continue to contract with the Manufacturing PMI falling from 51.8 in December to 51.3 in January. The National People's Congress in China will take place in early March and will set out new targets for the Chinese economy in 2018.

# Special Topic: Estimating the Natural Rate of Unemployment

## Summary

- ▶ The Treasury is evaluating several methods to estimate the natural rate of unemployment.
- ▶ As the rate is not directly observable from the data, estimating it involves imposing judgments. There are many plausible definitions and estimation methods. This Special Topic provides examples of how such judgments can affect the estimates.
- ▶ This Special Topic outlines the possible criteria for assessing the suitability of estimates of the rate.

## What is the natural rate of unemployment?

Even in a strongly performing economy, it is always likely to have some level of unemployment due to natural reasons that are independent of aggregate demand. It is 'natural', say for example, that people lose their jobs temporarily when transitioning from one job to another. This is known as frictional unemployment. Some unemployment is also natural when the employers and the employees cannot be matched due to geographic differences or skill mismatches. This is known as structural unemployment. The number of the naturally unemployed relative to total labour force is the natural rate of unemployment.

The rate is not directly observable from the data as we cannot easily classify each unemployed individual into naturally unemployed or unemployed because of the lack of aggregate demand. Due to conceptual difficulties and the uncertainty involved in estimating the natural rate, there is no consensus in the literature about its appropriate definition.

Most definitions, however, agree that inflation increases when unemployment is below the natural rate. The logic is the following. When the labour market is tight, ie, unemployment is lower than the natural rate, employees demand higher wages as there is increased competition to employ them. The increase in wages translates into rising production costs, which are passed on to consumers resulting in inflation.

Because of the relationship with inflation, some studies prefer to use the term Non-Accelerating Inflation Rate of Unemployment (NAIRU) instead of the natural rate of unemployment. Studies that use the term NAIRU tend to focus on the rate of unemployment at which inflation stabilises regardless of long term factors such as demographic changes or the structure of the labour market. The difference

between the two terms is subtle and many studies, including this Special Topic, use them interchangeably.

## Why it matters

The natural rate of unemployment is an important measure of slack in the labour market. An economy running at an unemployment rate higher than the natural rate has spare labour capacity that can be used without increasing inflation (and vice versa). The difference between the rate of unemployment and the natural rate is known as the unemployment gap. Given this link between the unemployment gap and inflation, the natural rate is also a useful indicator for current and future inflation pressures.

Recently, there has been a renewed interest in the natural rate of unemployment for two main reasons. First, the subdued wage inflation might be, at least partly, because the natural rate has declined or because the rate of unemployment has been persistently above the natural rate.

Second, phase 1 of the current review of the Reserve Bank Act of New Zealand 1989 will incorporate consideration of employment alongside price stability in monetary policy. The Terms of Reference of the review state that one of the areas of work in phase 1 of the review will recommend changes to the Act to require monetary policy decision makers "*give due consideration to maximising employment alongside the price stability framework*".<sup>1</sup>

## Estimation methods

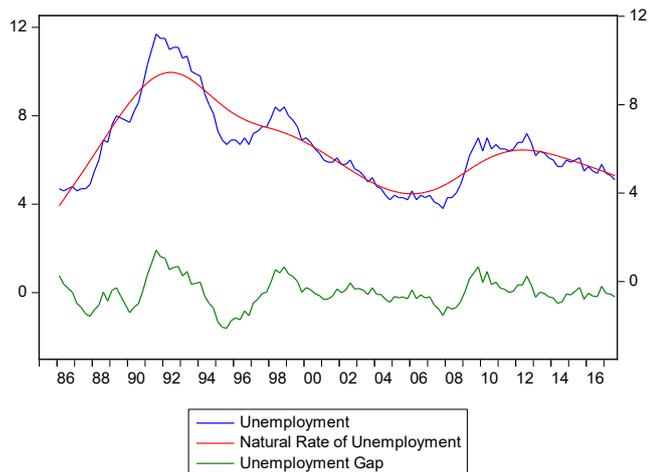
The uncertainty about the appropriate definition of the natural rate is mirrored in the uncertainty about the appropriate estimation method. The literature suggests a variety of empirical estimation methods. Each of which has relative advantages and disadvantages.

The following two examples illustrate how subjective decisions can result in different estimates of the rate. The first example relates to studies where the natural rate is defined as the trend component of the rate of unemployment. The natural rate here is viewed as the rate the economy converges to in the long run. However, the question is how smooth should the trend be? Answering this question depends on what the practitioner believes is sensible. Figures 1 and 2 show the different estimates of the natural rate based on different trend smoothness assumptions using the Hodrick-Prescott (HP) Filter.

<sup>1</sup> <http://www.treasury.govt.nz/publications/reviews-consultation/rbnz-act-1989/pdfs/rbnz-rev-tor-nov17.pdf>

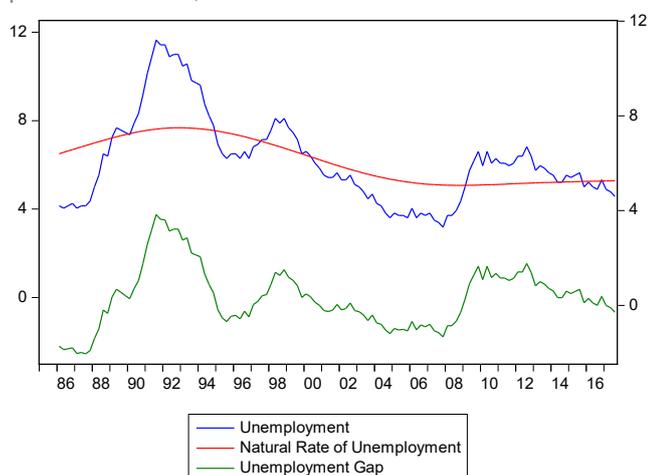
For more information about this method, refer to Cusbert, Tom. "Estimating the NAIRU and the Unemployment Gap." *Reserve Bank of Australia Bulletin*, June (2017): 13-22.

Figure 1: The natural rate using HP Filter with a smoothing parameter of 1600



Source: Statistics NZ

Figure 2: The natural rate using HP Filter with a smoothing parameter of 100,000



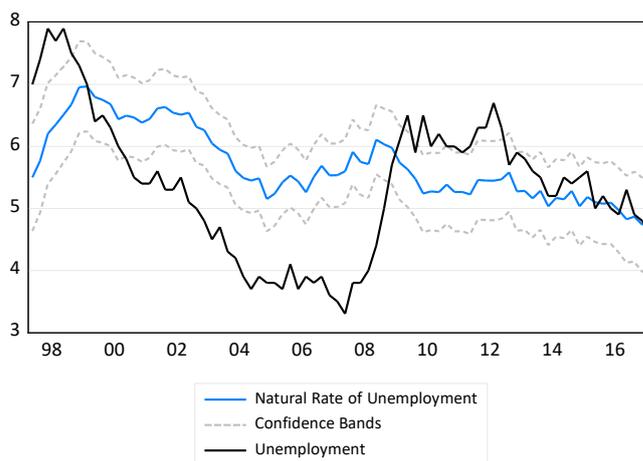
Source: Statistics NZ

The natural rate, and consequently the unemployment gap, differ significantly under each assumption of the smoothing parameter.

In the second example, a method known as the Kalman Filter is used to deduce the natural rate. The method assumes that the unemployment gap affects inflation while taking inflation expectations into account. It uses observations on inflation, inflation expectations, and unemployment to estimate the unobserved natural rate of unemployment.<sup>2</sup>

The estimated natural rate has wide confidence bands as shown in Figure 3 (two standard errors). This high degree of uncertainty around the estimation of the natural rate of unemployment makes it less useful to policymakers.

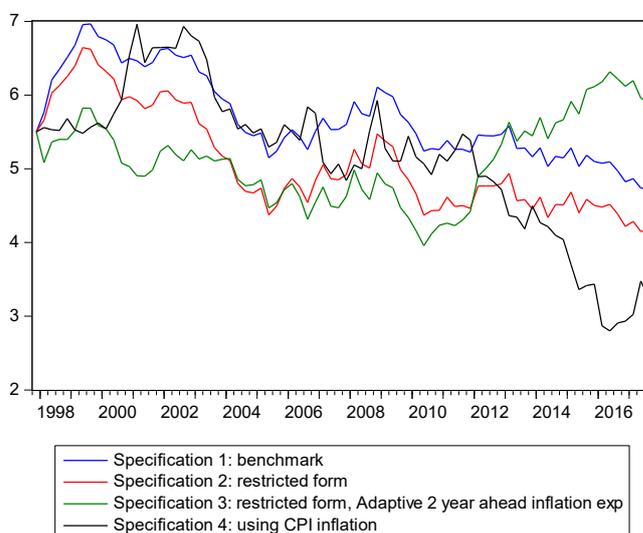
Figure 3: The natural rate using the Kalman Filter (benchmark specification)



Source: Statistics NZ, RBNZ

Like other methods, there are many choices to be made before specifying the Kalman Filter. What measures of inflation should be used? What is the appropriate time horizon and measure of inflation expectations? And so on. The following graph shows four different estimates of the natural rate under different plausible economic assumptions. The estimate from Figure 3 is used as a benchmark to compare with other specifications.

Figure 4: The natural rate using different specifications of the Kalman Filter



Source: Statistics NZ, RBNZ

<sup>2</sup> The initial value is set to 5.5% for all specifications.

The first specification uses wage inflation as a measure of inflation and two-year forward-looking inflation expectations. This specification allows the regression coefficient of the impact of inflation expectations on observed inflation to be different from one. The second variation uses the more common form where the regression coefficient of the impact of inflation expectations is restricted to one. The third replaces the measure of expectations with a two-year backward-looking weighted average of past CPI inflation (adaptive expectations). The last specification replaces wage inflation with a measure of headline CPI inflation.<sup>3</sup>

The Treasury currently estimates the natural rate of unemployment to be around 4.5% using a certain variation of the Kalman Filter.<sup>4</sup> The latest release of the Half Year Economic and Fiscal Update forecasts the natural rate to become 4.3% in 2020.<sup>5</sup> The Reserve Bank recently estimated the rate at 4.7% following other variations of the Kalman Filter as well.<sup>6</sup> Westpac put its estimate at 4.5%<sup>7</sup>. These numbers all fall in the region of possibilities presented in Figure 4.

## What makes a good natural rate of unemployment?

It is not possible to rely on economic theory alone to find out what the natural rate is. The choice of a particular method and data relies largely on subjective decisions. The Treasury is currently evaluating several methods to estimate the natural rate. Our current view is that a suitable estimate of the natural rate has the following properties:

- ▶ Clarity of definition and time horizon
- ▶ Has some predictive power for inflation
- ▶ Economically sensible. The rate needs to be consistent with Treasury's estimates of the output gap and external measures of skill shortages
- ▶ Calculated using a sensible method

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<sup>3</sup> The natural rate is calculated following Szeto, Kam, and Melody Guy. Estimating a New Zealand NAIRU. No. 04/10. New Zealand Treasury, 2004.

<sup>4</sup> <http://www.treasury.govt.nz/budget/forecasts/hyefu2016/011.htm>

<sup>5</sup> Half Year Economic and Fiscal Update, December 2017, New Zealand Treasury.

<http://www.treasury.govt.nz/budget/forecasts/hyefu2017>

<sup>6</sup> RBNZ Monetary Policy Statement, February 2018.

<sup>7</sup> Westpac Economic Review, February 2018.

# New Zealand Key Economic Data

## Quarterly Indicators

		2016Q2	2016Q3	2016Q4	2017Q1	2017Q2	2017Q3	2017Q4
<b>Gross Domestic Product (GDP)</b>								
Real production GDP	qtr % chg <sup>1</sup>	1.1	0.7	0.4	0.8	1.0	0.6	...
	ann ave % chg	3.8	3.9	4.0	3.7	3.3	3.0	...
Real private consumption	qtr % chg <sup>1</sup>	2.3	1.5	0.6	0.9	1.1	0.8	...
	ann ave % chg	4.3	4.9	5.0	5.3	5.0	4.3	...
Real public consumption	qtr % chg <sup>1</sup>	0.1	0.8	1.2	0.9	1.3	2.5	...
	ann ave % chg	1.5	1.4	1.8	2.0	3.0	4.1	...
Real residential investment	qtr % chg <sup>1</sup>	4.4	-0.5	0.2	-1.5	-0.6	3.3	...
	ann ave % chg	10.5	11.7	11.8	9.5	5.0	2.5	...
Real non-residential investment	qtr % chg <sup>1</sup>	1.0	0.6	1.5	0.8	1.0	0.3	...
	ann ave % chg	3.4	2.9	4.1	3.9	3.8	4.2	...
Export volumes	qtr % chg <sup>1</sup>	1.9	-0.9	-2.8	0.6	5.2	0.8	...
	ann ave % chg	4.8	3.0	1.6	0.7	0.0	0.6	...
Import volumes	qtr % chg <sup>1</sup>	2.4	1.8	1.7	1.0	0.8	2.1	...
	ann ave % chg	1.0	1.8	3.4	5.1	6.1	6.2	...
Nominal GDP - expenditure basis	ann ave % chg	5.2	5.3	6.0	6.0	6.3	6.6	...
Real GDP per capita	ann ave % chg	1.7	1.8	1.8	1.6	1.2	0.8	...
Real Gross National Disposable Income	ann ave % chg	3.8	4.1	5.0	4.7	4.6	4.6	...
<b>External Trade</b>								
Current account balance (annual)	NZ\$ millions	-6,827	-7,139	-6,554	-7,730	-7,386	-7,100	...
	% of GDP	-2.6	-2.7	-2.5	-2.9	-2.7	-2.6	...
Investment income balance (annual)	NZ\$ millions	-7,816	-7,611	-7,133	-7,700	-7,952	-8,339	...
Merchandise terms of trade	qtr % chg	-2.0	-1.2	5.8	3.9	1.4	0.8	...
	ann % chg	-3.8	-1.2	6.7	6.4	10.1	12.4	...
<b>Prices</b>								
CPI inflation	qtr % chg	0.4	0.3	0.4	1.0	0.0	0.5	0.1
	ann % chg	0.4	0.4	1.3	2.2	1.7	1.9	1.6
Tradable inflation	ann % chg	-1.5	-2.1	-0.1	1.6	0.9	1.0	0.5
Non-tradable inflation	ann % chg	1.8	2.4	2.4	2.5	2.4	2.6	2.5
GDP deflator	ann % chg	0.2	1.5	4.2	3.8	3.2	3.6	...
Consumption deflator	ann % chg	0.8	0.1	0.8	1.6	1.2	1.5	...
<b>Labour Market</b>								
Employment (HLFS)	qtr % chg <sup>1</sup>	2.5	1.1	0.9	1.0	0.0	2.2	0.5
	ann % chg <sup>1</sup>	4.5	6.1	5.8	5.7	3.1	4.2	3.7
Unemployment rate	% <sup>1</sup>	5.0	4.9	5.3	4.9	4.8	4.6	4.5
Participation rate	% <sup>1</sup>	69.8	70.0	70.6	70.6	70.1	71.1	71.0
LCI salary & wage rates - total (adjusted) <sup>5</sup>	qtr % chg	0.4	0.5	0.4	0.4	0.4	0.6	0.4
	ann % chg	1.5	1.7	1.6	1.6	1.7	1.8	1.8
QES average hourly earnings - total <sup>5</sup>	qtr % chg	0.5	0.5	-0.1	0.5	0.6	1.2	0.8
	ann % chg	2.1	1.7	1.3	1.5	1.6	2.2	3.1
Labour productivity <sup>6</sup>	ann ave % chg	0.8	-0.3	-1.3	-2.7	-1.7	-1.5	...
<b>Retail Sales</b>								
Core retail sales volume	qtr % chg <sup>1</sup>	2.5	0.5	1.4	1.3	1.9	0.6	1.8
	ann % chg	6.8	5.3	4.9	4.9	5.2	5.2	5.6
Total retail sales volume	qtr % chg <sup>1</sup>	2.1	1.0	1.4	1.4	1.8	0.3	1.7
	ann % chg	6.3	5.3	4.8	5.4	5.8	4.6	5.4
<b>Confidence Indicators/Surveys</b>								
WMM - consumer confidence <sup>3</sup>	Index	106	108	113	112	113	112	107
QSBO - general business situation <sup>4</sup>	net %	18.6	25.7	28.3	17.1	17.8	5.2	-11.8
QSBO - own activity outlook <sup>4</sup>	net %	16.8	39.2	27.0	20.6	18.4	35.2	18.7

## Monthly Indicators

		2017M07	2017M08	2017M09	2017M10	2017M11	2017M12	2018M01
<b>External Sector</b>								
Merchandise trade - exports	mth % chg <sup>1</sup>	6.8	-10.2	4.5	4.5	-0.9	14.0	-14.7
	ann % chg <sup>1</sup>	16.5	9.0	9.4	16.1	18.9	24.3	9.5
Merchandise trade - imports	mth % chg <sup>1</sup>	2.0	-3.5	6.0	6.5	4.9	-4.7	-0.3
	ann % chg <sup>1</sup>	4.9	5.2	2.1	14.3	27.0	10.8	17.1
Merchandise trade balance (12 month total)	NZ\$ million	-3213	-3148	-2925	-2967	-3476	-2879	-3218
Visitor arrivals	number <sup>1</sup>	307,500	306,500	309,200	315,410	322,940	313,980	313,830
Visitor departures	number <sup>1</sup>	324,840	300,400	312,180	319,170	322,190	324,240	314,270
<b>Housing</b>								
Dwelling consents - residential	mth % chg <sup>1</sup>	2.8	6.4	-2.1	-9.6	9.6	-9.6	...
	ann % chg <sup>1</sup>	-1.7	11.7	6.0	-1.0	8.6	-1.6	...
<b>Private Consumption</b>								
Electronic card transactions - total retail	mth % chg <sup>1</sup>	-0.6	-0.1	0.3	0.5	1.3	0.6	1.4
	ann % chg	2.0	4.4	2.9	1.3	4.3	3.3	3.4
New car registrations	mth % chg <sup>1</sup>	-4.2	6.5	-0.5	3.3	4.9	-7.9	2.8
	ann % chg	6.2	5.5	5.5	7.3	12.1	4.7	6.2
<b>Migration</b>								
Permanent & long-term arrivals	number <sup>1</sup>	11,050	10,610	10,530	10,960	10,890	11,050	11,410
Permanent & long-term departures	number <sup>1</sup>	5,320	5,150	5,270	5,300	5,180	5,270	5,200
Net PLT migration (12 month total)	number	72,402	72,072	70,986	70,694	70,354	70,016	70,147
<b>Commodity Prices</b>								
Brent oil price	US\$/Barrel	48.48	51.70	56.15	57.51	62.71	64.37	69.08
WTI oil price	US\$/Barrel	46.61	48.05	49.83	51.60	56.66	57.93	63.66
ANZ NZ commodity price index	mth % chg	-2.1	0.2	1.7	2.5	1.4	-2.8	-2.8
	ann % chg	17.8	15.8	13.3	13.8	11.9	6.7	4.8
ANZ world commodity price index	mth % chg	-0.8	-0.8	0.8	-0.3	-0.9	-1.9	0.7
	ann % chg	21.1	16.3	11.5	10.4	6.0	3.2	4.1
<b>Financial Markets</b>								
NZD/USD	\$ <sup>2</sup>	0.7350	0.7311	0.7246	0.7062	0.6888	0.6953	0.7255
NZD/AUD	\$ <sup>2</sup>	0.9434	0.9233	0.9089	0.9060	0.9034	0.9110	0.9123
Trade weighted index (TWI)	June 1979 = 100 <sup>2</sup>	78.41	77.08	75.85	74.73	73.11	73.48	74.91
Official cash rate (OCR)	%	1.75	1.75	1.75	1.75	1.75	1.75	1.75
90 day bank bill rate	% <sup>2</sup>	1.96	1.95	1.95	1.94	1.92	1.88	1.88
10 year govt bond rate	% <sup>2</sup>	2.97	2.88	2.92	2.97	2.85	2.76	2.88
<b>Confidence Indicators/Surveys</b>								
ANZ - business confidence	net %	19.4	18.3	0.0	-10.6	-39.3	-37.8	..
ANZ - activity outlook	net %	40.3	38.2	29.6	22.0	6.5	15.6	..
ANZ-Roy Morgan - consumer confidence	net %	125.4	126.2	129.9	126.3	123.7	121.8	126.9
Performance of Manufacturing Index	Index	55.6	58.1	57.7	57.3	57.6	51.1	55.6
Performance of Services Index	Index	55.9	57.1	56.0	55.7	56.5	56.0	55.8
qtr % chg	quarterly percent change			<sup>1</sup>	Seasonally adjusted			
mth % chg	monthly percent change			<sup>2</sup>	Average (11am)			
ann % chg	annual percent change			<sup>3</sup>	Westpac McDermott Miller			
ann ave % chg	annual average percent change			<sup>4</sup>	Quarterly Survey of Business Opinion			
				<sup>5</sup>	Ordinary time			
				<sup>6</sup>	Production GDP divided by HLFS hours worked			

Sources: Statistics New Zealand, Reserve Bank of New Zealand, NZIER, ANZ, Haver, Westpac McDermott Miller, ANZ-Roy Morgan, REINZ, BNZ-Business NZ