

Great expectations

A quick look at what influences NZ inflation expectations

- **We have estimated the drivers of NZ inflation expectations for all the main survey measures.**
- **Our findings indicate that inflation expectations are largely determined by recent economic events and actual inflation outcomes.**
- **Inflation expectations are likely to fall sooner than the RBNZ's model forecasts of inflation expectations would suggest. We find inflation expectations to be less sticky than the RBNZ's model implies.**
- **Our forecasts suggest the key RBNZ 2-year inflation expectation measure is likely to drop markedly over calendar 2007.**
- **The RBNZ will be able to take comfort from the strong likelihood of a marked fall in both headline inflation and inflation expectations over 2007.**

Quick overview

Inflation expectations are important because our everyday perceptions of where inflation will sit can influence the level of inflation itself. A period of high inflation could start to get us thinking that inflation will be that much higher going forward, and our perceptions accordingly shift to believe that prices and wages will be rising at a faster rate. If that thought process turns into reality, then inflation itself becomes more ingrained.

Inflation expectations have taken on much greater significance over the past couple of years. One, with inflation bursting out of the inflation target band the RBNZ has been worried that inflation expectations become unanchored. Second, the RBNZ has altered its inflation forecasting process to explicitly include historical surveyed inflation expectations rather than a model-generated history. Third, inflation expectations now take on a greater weight in determining the RBNZ's inflation outlook.

We examined the determinants of all the main NZ inflation expectations surveys, including the key 2-year RBNZ survey measure that is used in the RBNZ forecasting framework.

The main findings are:

- The RBNZ 2-year measure is the best explained of all the measures;
- Expectations react quite swiftly to recent developments suggesting that, as the main influences of the recent lift in expectations continue to turn, inflation expectations won't be too far behind.

Now that interest rates are rising, the economy is slowing, and headline inflation itself has started dropping, inflation expectations are poised to fall over 2007. Notwithstanding how high expectations have risen over the past year, we believe the RBNZ should be less concerned about the risks that inflation expectations remain high and make inflation itself slow to come down.

The estimation

We estimated the determinants of the following inflation expectations series:

- RBNZ Survey of Expectations – a small-sample survey of business professionals (which has a heavy weighting to respondents in the finance industry) for one and two-year ahead inflation expectations.
- AON Consulting survey of professional forecasters for one-year and four-year ahead inflation expectations.¹
- NBNZ Business Outlook survey of business people of one-year inflation expectations.
- Marketscope survey of consumers' one-year ahead inflation expectations.

¹ A seven-year measure is also surveyed, though is so static we have excluded it.

Table: Equations for RBNZ 2-year measure**Equation 1:**

$$\text{RBNZ2} = 1.36 + 0.35 \cdot \text{RBNZ2}(-1) + 0.12 \cdot \text{CPI}(-1) + 0.023 \cdot \text{GAP}(-1) + 0.22 \cdot \text{LCI}(-1) - 0.03 \cdot 90\text{-day}(-1) - 0.07 \cdot 90\text{-day}(-4)$$

Equation 2:

$$\text{RBNZ2} = 1.42 + 0.31 \cdot \text{RBNZ2}(-1) + 0.004 \cdot \text{Petrol} + 0.12 \cdot \text{CPI}(-1) + 0.02 \cdot \text{GAP}(-1) + 0.19 \cdot \text{LCI}(-1) - 0.03 \cdot 90\text{-day}(-1) - 0.06 \cdot 90\text{-day}(-4)$$

RBNZ Equation:

$$\text{RBNZ2} = 0.75 \cdot \text{RBNZ2}(-1) + 0.175 \cdot [\text{average of CPI}(-5) \text{ to CPI}(+1)] + 0.075 \cdot [\text{average of CPI}(+2) \text{ to CPI}(+12)]$$

Though Equation 2 has marginally better diagnostics, Equation 1 in practice produces better 1-quarter ahead forecasts.

We estimated the determinants of the various NZ inflation expectations measures, throwing into the mix past inflation, the output gap, the 90-day rate, and annual changes in the NZD and Labour Cost Index.² Given the potential influence of petrol prices, we estimated alternative specifications by including petrol in addition to inflation and also in replacement of inflation to seek the best explanatory result for each inflation expectations measure. We started out with four lags for all variables, and the contemporaneous values for petrol, the TWI and the 90-day rate on the basis that the current period's values are readily observable. We also included the first lag of inflation expectations.

The general results were:

- Expectations were explained heavily by the more recent lags of the explanatory variables, indicating that expectations are quick to adapt to recent events;
- In order from most to least explained: RBNZ 2-year, RBNZ 1-year, AON 4-year, NBNZ, AON 1-year, Marketscope. With the exception of the AON 1-year and Marketscope measures the estimated equations explained around 90% of the expectations measures;
- In order from most to least accurate fit (measured by the estimates' standard errors): RBNZ 2-year, AON 4-year, NBNZ, RBNZ 1-year, Marketscope, AON 1-year;
- Interest rates generally have a negative coefficient, suggesting that if people observe the RBNZ is taking action they are more confident that inflation will fall in the future;
- The inclusion of petrol did not aid the explanation of what drives the AON and NBNZ measures, and only marginally boosted the ability to explain the RBNZ and Marketscope measures.

It shouldn't be too much of a surprise that the inflation expectations of professionals/experts can be explained to a greater degree by macroeconomic developments. The RBNZ would probably take a bit of comfort that it is the measure they use in their modelling that comes out as the most explainable.

The way in which our equations are structured means that inflation expectations rely less heavily on their first

lag: the RBNZ's specification uses a 0.75 coefficient on the previous quarter's inflation expectations and 0.25 in total on past and future inflation. In our equations the other macro variables are able to have a much higher weight relative to lagged inflation expectations, so should be relatively more influenced by economic developments – aided by the shorter lags in the estimated equations (the RBNZ's equation uses lagged inflation up to 5 quarters).

Our expectations

We used our economic forecasts (inflation, wages, etc.) to project forward two alternative equations for the RBNZ's 2-year inflation expectations measure. We also produced a mechanistic inflation expectations forecast from the RBNZ's inflation expectation equation, using our inflation forecast track.³

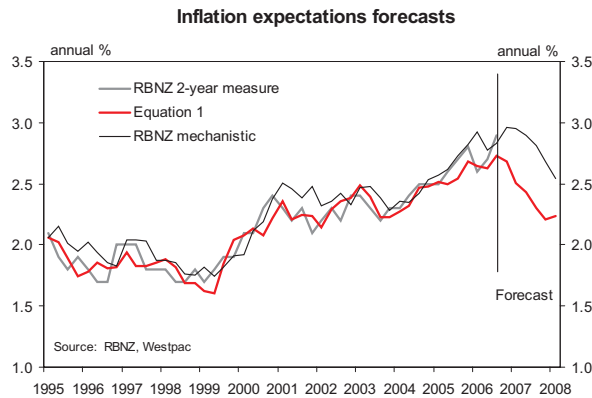
The forecasts (overleaf) are on a 1-quarter ahead basis: we use the lagged inflation expectation survey results in producing the forecasts over the historical period. To produce forecasts over 2007 we switched to using each model's prediction for the previous quarter.

Our equations suggest that inflation expectations should start falling noticeably from early 2007 – if not in the Q4 survey (published 21st November). One other important point is that our equations appear quicker at picking up turning points in inflation expectations. Moreover, they are picking that inflation expectations will turn down 1-2 quarters before the RBNZ's equation implies.

² Read only if you are technically-minded or already need a distraction: estimating using annual changes at quarterly frequency throws up the potential for a moving-average process in the equation's residuals. In line with the literature in this area we corrected for this problem using the robust errors and Newey-West technique in the RATS econometrics package.

³ The RBNZ's forecasts of inflation expectations rely on the forecasting model's forecasts of inflation over the next 3 years. The RBNZ model also solves simultaneously: the inflation expectations forecasts depend on the inflation forecasts and vice versa. Our 'forecasts' of inflation expectations using the RBNZ forecast equation will differ from the RBNZ's forecasts: we have a different inflation outlook and are our inflation forecasts are also independent of the inflation expectations equation (we do not have the resources or aspirin to build a complex model similar to the RBNZ's). Hence, the mechanistic 'RBNZ' forecasts presented in this bulletin should not be viewed as the actual output of the RBNZ's forecasting process.

In Q3 the 2-year measure was 2.9%. For Q4 itself our two equations predict outcomes of 2.7% from Equation 1 and 2.9% from Equation 2. Both Q4 forecasts are little changed from their Q3 forecasts, and suggest inflation expectations should at the least now be capped. In contrast, our synthesised RBNZ measure implies a slight increase to 3%, reflecting its heavy reliance on the (rising) Q3 inflation expectation outcome and inflation well in excess of 3% over the past 5 quarters.



Implications for the RBNZ

Our work shows inflation expectations are strongly influenced by recent economic developments and inflation outcomes. Inflation expectations are likely to fall back quicker than the RBNZ's own modelling process implies.

It may not be the Q4 survey that starts to show the fall – but the RBNZ should have the confidence that inflation expectations will head down in concerted fashion over the next year. The reweighting of the CPI – which will drop inflation markedly – should boost that confidence. We believe that gives the RBNZ scope to take on the chin a high reading in Q4 – should one eventuate – but not beyond that.

The impact of falling inflation expectations on the RBNZ's inflation outlook should not be underestimated. Our Bulletin "*Expectant*" (16/10) showed that if the inflation expectations track was 0.25 percentage points lower that could reduce the RBNZ's 90-day rate track by 30 to 40 bps.

Further work forthcoming

We will provide more detailed coverage of these results in a forthcoming Occasional Paper. We have also looked into inflation expectations in much greater depth and breadth.

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