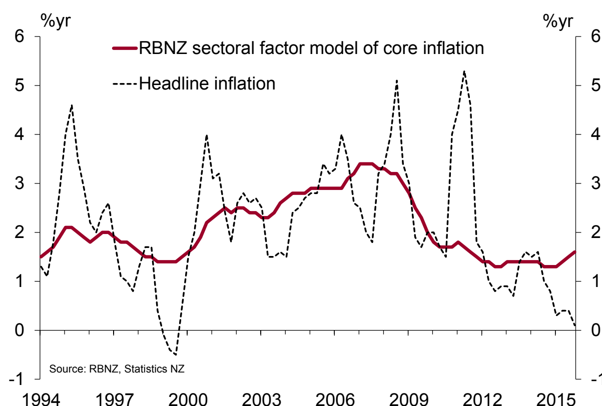
Westpac Institutional Bank

Core workout
Assessing the value of core inflation

22 February 2016

- With headline inflation remaining surprisingly low, the Reserve Bank has recently been drawing attention to its own model-based estimate of core inflation.
- The RBNZ model produces a core inflation series that is relatively smooth and has remained within the 1-3% target range.
- However, it does not refute the idea that low inflation has been a widespread and persistent trend, rather than just the product of one-off shocks such as the plunge in oil prices.
- The core inflation series corresponds fairly well with a combination of the exchange rate and wage costs. Our forecasts in that regard suggest that returning core inflation to the target midpoint on a sustained basis will be a challenge.

Headline vs core inflation



Headline inflation as measured by the Consumer Price Index (CPI) has been remarkably low in recent times, falling to a 16-year low of just 0.1% last year. This does not in itself constitute a breach of the RBNZ's Policy Targets Agreement (PTA), which specifies a focus on average future inflation, and provides scope to look through temporary shocks such as the plunge in world oil prices.

Nevertheless, past outcomes are still relevant. The longer that headline inflation remains outside the target range, the more that people will question whether the RBNZ's forecasts of a return to target are credible. With that concern in mind, the RBNZ has recently been drawing attention to the concept of 'core' inflation, and in particular its own model-based estimate of core inflation.

In this article we describe how the RBNZ's preferred core inflation measure is calculated, the limitations of this approach, and what it may tell us about the future of inflation. The main thing to keep in mind is that core inflation is not a 'better' gauge of inflation than the headline rate, it's just more stable, and that stability is largely by design. This means that even a seemingly small deviation from the inflation target can be meaningful. In New Zealand's case, we note that while core inflation has remained within the 1-3% target range, it has been substantially below the 2% midpoint of that target for several years.

The stability of the core inflation series also means that once it does deviate from the target, it can take quite a lot to get it back on track. Indeed, what's notable is how little core inflation has risen given the size of the fall in the exchange rate to date. Our economic forecasts suggest that it will be difficult for the RBNZ to return core inflation to around 2% on a sustained basis, which is a strong argument for keeping the OCR low.

Core concepts

The idea behind a core measure of inflation is to strip out price movements that are considered temporary or sector-specific, and hence may not be representative of movements in the general level of prices. The most commonly used method is to exclude food and/or fuel prices, which can both be quite volatile in the short term. The drawback here is that these items may also have a sustained trend in prices, so excluding them could understate or overstate the true rate of inflation.

The Reserve Bank of Australia has long used a slightly more sophisticated approach, taking an average of the trimmed mean and weighted median measures of inflation. Both of these are methods of stripping out extreme price movements from the CPI, but without pre-determining which items will be removed from one quarter to the next.

The RBNZ looks at a range of measures of core inflation, including the ones just mentioned. But its preferred measure is conceptually quite different from these. Instead of excluding particular groups, it compiles the histories of all groups in the CPI, and uses a factor model to try to distinguish between the idiosyncratic price movements of each group and a 'common thread' that runs through all of the groups. This common factor is not observable, but is specified to have certain properties – in particular, that it evolves smoothly over time.[1]

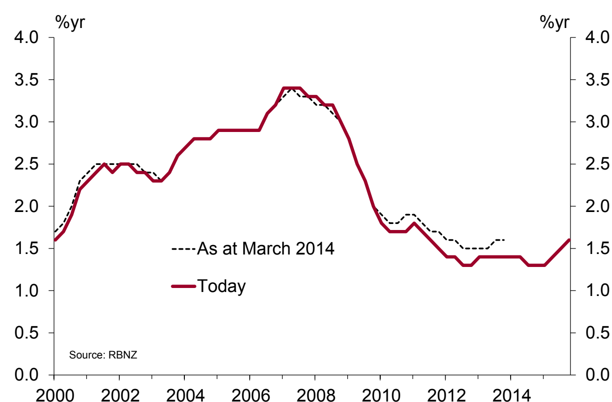
The resulting series is shown on the chart on the first page, contrasted with the headline inflation rate. Even as headline inflation has dropped to record lows, the core inflation measure has remained well within the 1-3% target range, and has even risen a little, from 1.3% to 1.6% over the last few quarters. The gap between these two series would seem to confirm that much of the recent weakness in headline inflation is due to idiosyncratic price changes such as the plunge in oil prices.

There are a few points to note about this method of calculating core inflation. Since it is model-derived, the result can vary depending on the model's inputs and settings. For instance, the model is re-estimated every quarter with each CPI release, which means that, unlike the simpler approaches to core inflation mentioned earlier, the history of the series can be revised over time. The chart to the right shows the core inflation series as at March 2014, when the RBNZ began raising the OCR, compared with the most recent iteration.

The second key point is that the stability and smoothness of the core inflation series is largely by construction. The factor model doesn't just remove noisy items, it aims to remove the noise from every item in the CPI. That tends not to leave much behind; the resulting core inflation series will show much less variation than the other core inflation approaches discussed earlier.

That stability can be a double-edged sword, though. It implies that it actually takes a lot to push core inflation away from target for any length of time. Over the long term, we should expect to see both core and headline inflation heading back

Revisions to core inflation estimate



to the 2% midpoint of the inflation target. So it's significant that core inflation has been persistently below that mark since 2010. Rather than showing that low inflation has been due to temporary factors, the core inflation series actually reinforces the sense that there are pervasive, long-lasting forces keeping inflation down. At the very least, this confirms that it's appropriate for interest rates to remain low.

Core views

Just as it takes some effort to push core inflation away from the target midpoint, it can also take a lot to bring to back to that target. The recent uptick in core inflation might seem encouraging in that regard, but we'd warn against extrapolating from this. Core inflation measures are simply smoothed versions of contemporaneous inflation; they make no claims about being able to predict headline inflation, beyond the fact that temporary price shocks will eventually drop out of the annual inflation rate calculation.

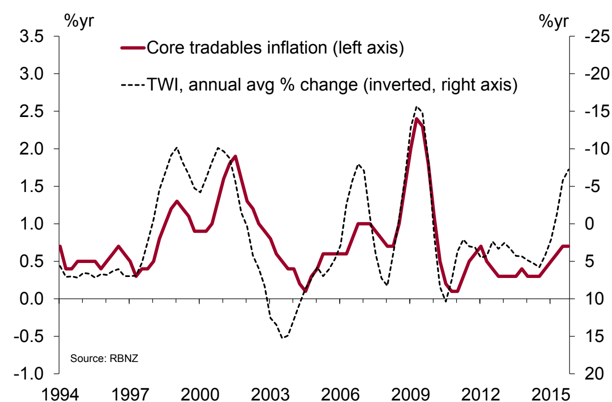
While estimating the core inflation rate itself is complex, it's not hard to identify the forces that it might be capturing. First, we note that the model actually calculates two factors: one for tradables (those goods and services that can be traded across borders) and one for non-tradables (which is largely services).

The obvious common factor for tradables is the exchange rate: a fall in the New Zealand dollar raises the prices of all imports in equal measure. And since the NZD trade-weighted index was around 7% lower on average over 2015 compared to 2014, we should expect to have seen some meaningful upward pressure on core tradables prices by now.

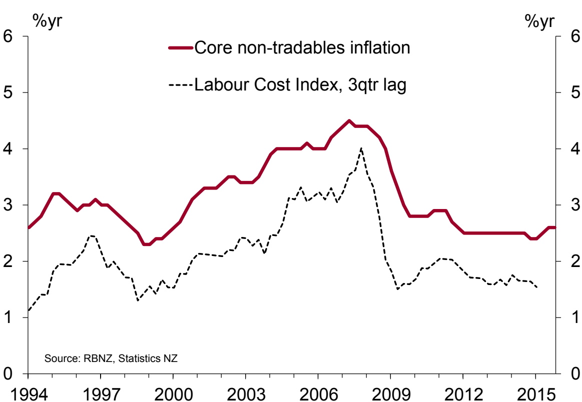
The first chart on the next page confirms this connection. In fact, what really stands out is how little the core tradables inflation measure has risen so far, given the size of the decline in the NZD. This may be a sign that firms are struggling to maintain their margins as import costs rise, or it may be that low global inflation and falling transport costs are counteracting the effects of the lower exchange rate.

1 The model was first detailed in www.rbnz.govt.nz/research-and-publications/discussion-papers/2010/dp2010-13, with tweaks to bring it up to the current version described in www.rbnz.govt.nz/research-and-publications/analytical-notes/2013/an2013-06. The core inflation series can be found at www.rbnz.govt.nz/statistics/m1.

Core tradables inflation vs NZ dollar



Core non-tradables inflation vs labour costs



What's more, the impact of the exchange rate may be widespread, but it is still only temporary. In the absence of a further sizeable fall in the NZD, we'd expect the impact on core tradables inflation to peak and then fade over the next few quarters.

As for non-tradables, since these items tend to be labour-intensive, the most plausible common factor is wage costs. And indeed, the final chart shows a strong correlation between core non-tradables inflation and the Labour Cost Index. The LCI appears to lag by a few quarters, but that's not too concerning, as it tends to lag behind other labour market indicators as well.

With this in mind, the case for a sustained lift in core non-tradables inflation is unclear. There are signs that the labour market is gradually tightening up, although the recent plunge in the unemployment rate from 6.0% to 5.3% almost certainly overstates the case. Firms are reporting that finding skilled workers is getting harder, and wage growth has picked up in real (inflation-adjusted) terms. However, since inflation compensation tends to be a major component of wage increases, the recent history of low headline inflation means that nominal wage growth has actually been slowing. This is an instance of low inflation begetting low inflation, a cycle that can be hard to break.

If the correlations that we've identified here hold up, then our current economic forecasts (as detailed in our latest quarterly *Economic Overview*) suggest that it will be difficult to get core inflation much higher on a sustained basis. We expect a further decline in the NZD this year, but at a slower pace than last year, which would argue against a lift in the rate of core tradables inflation from its current pace.

The prospects for a lift in core non-tradables inflation look somewhat better, at least in the short term. We're expecting moderate economic growth over the next couple of years, with a further gradual tightening of the labour market. Our concern though is that beyond 2017, as the level of earthquake rebuild activity winds down, we could face a lengthy period of sub-par GDP and employment growth and an easing in domestic inflation pressures. If core inflation isn't anchored around the 2% midpoint of the target by then, that task will become even more difficult going forward.

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