New Zealand Activity Index (NZAC): Q&A

30 June 2020

1 How should I interpret the NZAC index?

NZAC summarises several monthly indicators of economic activity. This currently (as of June 2020) includes consumer spending, unemployment, job vacancies, traffic volumes, electricity generation, business outlook, and manufacturing activity. It is intended to be interpreted as a broad measure of economic activity.

However, anyone using or quoting NZAC should always bear in mind the set of indicators that underlie its construction. For example, NZAC does not currently include measures of construction activity or international trade, to give just two examples. As a result its coverage is far from complete. We will continuously be seeking to improve the input coverage of the index over time.

Percentage changes in NZAC can be compared to percentage changes in GDP along the lines of: “year-on-year GDP growth to Dec 2019 was x%, versus y% for the NZAC”. However, NZAC should not be interpreted as a ‘flash-estimate’ or high-frequency version of GDP. The reasons for this are explained more fully in questions 8 through 12 below, and the technical note that accompanies this Q&A document on the Treasury website.

2 Is NZAC an official statistic, similar to say GDP or the unemployment rate as reported by Stats NZ?

No. The NZAC index has been constructed by staff at the Treasury, Stats NZ and the Reserve Bank of New Zealand using a range of different data sources. As such, it is not an official government statistic and will be subject to ongoing revisions as we refine the methodology and data sources going forward.

NZAC should therefore be viewed as an experimental product that is being made publicly available to provide a more granular and timelier signal of movements in the New Zealand economy. That said, in time we intend for NZAC to stabilise into a reliable measure of economic activity that complements the official economic statistics.

3 Why was NZAC developed?

NZAC was developed to supply government policymakers, markets and the general public with a timelier and more granular indicator of movements in the economy. This is intended to help provide an early signal while waiting for the official, more definitive measures of economic activity such as GDP.

For example, the COVID-19 pandemic has brought the need for timely economic monitoring information into sharp focus. There is significant interest in knowing how the economy has fared in the June quarter. The official and most accurate measure of economic activity for this period (GDP) will be published on September 17, 2020. During this time, NZAC will have provided an early signal of movements in the economy for April through August.

Some countries use monthly GDP or monthly industrial production to measure economic activity. However, these measures are not available in New Zealand. NZAC helps to fill this gap by summarising the information contained in several monthly indicators that, while also useful on their own, can provide more information when considered together.

4 How is NZAC constructed?

In essence, NZAC is a weighted average of its constituent indicators. Specifically, it is the weighted average that best captures the common movement of these indicators. This approach filters out the noise associated with individual indicators, and provides a more comprehensive measure than each individual indicator by itself. More details about how the index is constructed is provided in the technical note that accompanies this Q&A document on the Treasury website.

5 What is the difference between NZAC and other indicators of economic activity?

NZAC synthesises the information contained in many indicators into one summary index. All of these indicators provide useful information in their own right, but when we look at them together, we can analyse their co-movement. This is what NZAC seeks to do. As such, NZAC is a useful way of synthesising information from (a potentially large set of) indicators that are otherwise diverse and heterogeneous.

Even though the current version of the index is still experimental, the early results provide much encouragement that NZAC can provide a useful signal of how the economy is tracking. Moreover, the future of NZAC looks bright, as all three departments are committed to continually acquiring more data to improve its accuracy, timeliness and frequency.

6 Do other countries have similar measures?

Yes. The methodology we have used to construct NZAC is commonly used in the macroeconomics and machine learning literature – and will be familiar to empirical macroeconomists. Most notably, the Federal Reserve Banks of New York and Chicago both report similar indices which are regularly quoted by economic commentators[1], as do many other institutions across the world. As such, there is a strong precedent for the modelling approach that is used to construct NZAC.

7 Is NZAC a forecast of economic activity?

No. The NZAC index does not provide a forecast of economic activity. It uses indicators that are reported in near-real time to produce a timely read of economic activity in the near past.

1 Respectively the Weekly Economic Index (WEI), and the Chicago Fed National Activity Index (CFNAI).

8 What is the relationship, if any, between NZAC and GDP?

Whilst both quantities seek to measure economic activity, NZAC is conceptually different to GDP. In particular:

- **GDP** is compiled using an internationally consistent framework (the System of National Accounts) to produce an integrated and coherent view of economic activity. It provides a comprehensive measurement of the individual components of aggregate demand in the economy.
- **NZAC** uses statistical modelling to extract only the common signal present in a very diverse set of economic indicators. There is in fact only a very limited overlap between the indicators that are used to construct NZAC, and the components of GDP.

These differences mean that there are good reasons for why NZAC and GDP might provide contrasting signals even though they both seek to measure economic activity. In such cases, GDP should always be used as the most authoritative measure. Please see the technical note for NZAC for more details on the interpretation of NZAC relative to GDP.

9 Can I use NZAC instead of GDP?

Not really. NZAC **can** be used to get a timelier read on movements in the economy than GDP. However it **should not** be used as a ‘flash-estimate’ or high frequency version of GDP. As mentioned in the answer to question 8, and elaborated-on in the NZAC technical note, NZAC is conceptually different to GDP.

NZAC has been constructed in such a way that it can be compared on the same scale as annual GDP growth. This means that we can make sideways comparisons between NZAC and GDP growth along the lines of, “year-on-year GDP growth to Dec 2019 was x%, versus y% for NZAC”. However, y should not be interpreted as an advance estimate of x.

Also NZAC does not provide any cross-sectional information. For example, it does not allow any breakdown of activity by final demand category, industry or region.

10 How exactly should I compare NZAC to GDP?

NZAC is presented in terms of annual percentage changes (apc). Therefore a value of say 2.5 for a given month should be interpreted as ‘economic activity as measured by NZAC is 2.5% higher than the corresponding month a year previous’. However, comparing NZAC to GDP is complicated by the fact that GDP is measured on a quarterly basis, whereas NZAC is measured on a monthly basis. For example:

- year-on-year GDP growth to December 2019 was 1.8%. This means that output in the months from October through December was 1.8% higher in 2019 than in 2018, whilst
- year-on-year growth in NZAC to December 2019 was 1.7%. This means that economic activity as measured by NZAC was 1.7% higher in December 2019 relative to December 2018.

Although these measurements (1.8% for GDP and 1.7% for NZAC) are similar, they cover different windows of activity (quarterly for GDP and monthly for NZAC) – and so are not really comparable. In this example, the best way to compare NZAC to GDP would be to look at the three monthly NZAC figures for October through December 2019, and compare these to the December 2019 figure for GDP. This gives 1.3%, 1.8% and 1.7% for NZAC – October through December – compared to 1.8% for December quarter GDP.

11 Is NZAC more accurate than GDP?

No, and they measure different things (see answer 8). GDP is our most accurate measure of economic activity, primarily because it uses higher quality inputs and because of the completeness of its coverage of industries and final demand categories. However, the accuracy of GDP comes at a price: it takes many weeks after the quarter ends to compile it; moreover, limitations in data sources prevent it from being compiled at a higher frequency (eg, monthly). Hence, the main advantages of NZAC are its higher frequency and timeliness.

12 Will NZAC predict GDP growth accurately?

This is not really the purpose of NZAC. The Treasury and the Reserve Bank of New Zealand both publish forecasts of GDP growth, and these (as well as other commentators' forecasts) should be referred to when making statements about forecast GDP.

A simple plot of NZAC against GDP shows that they do correlate well for long periods of time, but they also diverge from each other at times. This is to be expected. Both measures seek to quantify movements in the economy, but as detailed in questions 8 through 10, there are fundamental conceptual differences between NZAC and GDP. NZAC might, however, be used as an input to another model that sought to forecast GDP growth. We have not sought to do this.

13 Why wasn't a higher-frequency estimate of GDP developed?

Developing a higher frequency release of GDP was ruled out owing to the expense and time needed for such a project. NZAC uses statistical modelling on top of a much narrower (yet diverse) set of data, which is already collected and reported monthly; which meant that it could be developed much more quickly.

14 How does the 19% April drop shown by NZAC compare to the 40% drop in GDP presented in Treasury's economic scenarios for activity under level 4?

As mentioned in answer 1, NZAC should always be interpreted in terms of the set of indicators that underlie its construction. In this respect, the input coverage of NZAC is far from complete. In particular, the incidence of the lockdown will have been felt very unevenly across different industries. Many areas of activity that were severely hit under level 4 – such as tourism, hospitality, education, and construction (to name just a few) – are not necessarily well captured in NZAC. These sectors/industries will be captured much more systematically in the Treasury's economic scenarios.

We consider it likely that if indicators of such activity could be obtained, the magnitude of the drop in April shown by NZAC would be magnified. In fact, we fully expect the size of this drop to be revised as the index is refined.

15 NZAC seems to spike unexpectedly in some months. Is it really a reliable indicator of activity?

On the whole, higher-frequency data (eg, monthly) is more "noisy" than lower-frequency data (eg, quarterly). NZAC actually tries to filter out the noise of individual indicators, by seeking out only the co-movement of its constituent indicators. It does a relatively good job of this, as can be observed by comparing NZAC to any of the constituent indicators on which it is based.

However, this process will always be imperfect. If there is a particularly strong positive or negative spike in one of the underlying indicators, this may show-up in NZAC. The good news is that we can always refer back to the individual indicators themselves to see what might be driving such a spike. As a result, we will seek to provide commentary around each update to NZAC which will try to unpick the movements in the index. This should help to assess the credibility of any unusual signals. In addition, this "sensitivity to noise" should diminish as we add more data to NZAC. At present, the index relies on only 8 series – so it can sometimes be sensitive to a very large positive or negative spike in say, electricity generation or traffic.

16 Does NZAC capture activity in industry/sector x, y, z?

As mentioned in answer 1 and 13, the input coverage of NZAC is far from complete. At present, NZAC doesn't really capture specific sectors directly – it only captures them insofar as these sectors are correlated to the broader measures of economic activity that are used to construct the index. As a result, shocks to the economy that are very uneven in incidence (eg, a drought, or the lockdown) might not be well-captured by NZAC. As mentioned in answer 1, NZAC should always be interpreted relative to the set of indicators that underlies its construction.

17 At BEFU the Treasury forecast GDP to decline by 25% in the June quarter, are you wrong?

NZAC does not change the underlying view of the economy that the Treasury presented at the *Budget Economic and Fiscal Update* (BEFU) 2020. We still expect to see a large contraction in growth in the June quarter, followed by a partial rebound in the September quarter, and a further economic recovery afterwards.

While we are cautious about what it might suggest for GDP, NZAC does nonetheless point to some upside to those initial estimates. Our initial estimate for June quarter GDP was based on longer periods of time at higher alert levels. We've also made a quicker progression to Alert level 1 than what we assumed at BEFU, and therefore activity has been able to resume more quickly.

It's worthwhile pointing out that those initial estimates were made with very little information, and an understanding of alert levels that has subsequently changed over time. We're quite conscious of this and have continued to analyse new activity indicators as they've become available, some of which have shown activity falling by as much as 90% in some months. NZAC is, we believe, a useful way of summarising those activity indicators and we will be watching it closely over coming months.