

# Changes to the treatment of seasonal adjusted series in the Credit Card survey

## Purpose

This Methodological Note describes the treatment of seasonal series from the Credit Card Survey (Table C12-C13) which have been affected by temporary or longer term changes in the economy as a result of Covid-19

From June 2021, a decision has been made to:

- pause the publication of series about international and overseas, due to breaks in both the trend and seasonal patterns in these series.
- revise other series' models to apply treatment to the seasonally adjusted series due to short term changes in these series.

## Seasonally adjusted series

When a time series shows a seasonal pattern, comparing different periods might not be easy. The seasonal adjustment process aims at highlighting the most significant movements while decomposing the series into three components:

- trend (long-term movements)
- seasonal (regular, reoccurring pattern)
- irregular (one-off effects)

The seasonally adjusted series is obtained by combining the trend and the irregular; in other words, it removes the regular seasonal pattern.

## Covid-19 impacts on seasonal adjustment

Covid-19 has had a severe impact on the economy, leading to many breaks of series. Some series have already returned to normal levels and expected seasonal patterns but other series are still highly impacted by Covid-19 effects.

In the first case, these effects have to be absorbed by the irregular component, as they are not part of the long-term movements (trend). A special treatment can be built with the help of seasonal adjustment tools. As recommended by statistical institutes (see [EuroStat](#) and [Stats NZ](#)), using successive one-off outliers (Additive Outliers<sup>i</sup>) treats these unusual data points as part of the irregular without impacting the long term trend.

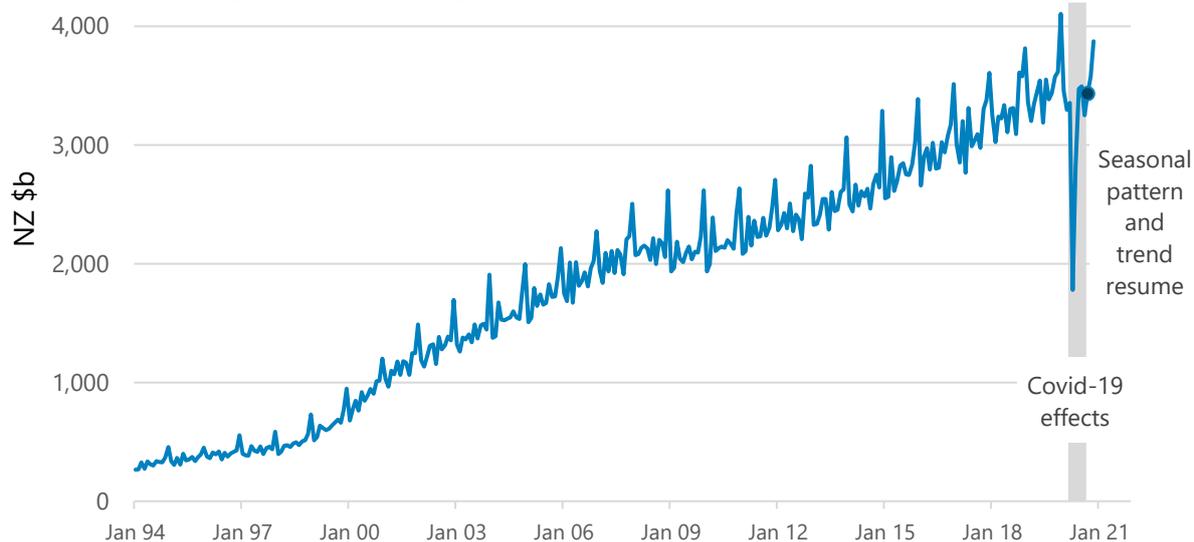
The second case, met in the Credit Card survey when dealing with international or overseas data, results as a break down in the trends and the loss of the seasonal pattern. In such a situation, we decided to stop publishing seasonally adjusted series as they are no longer meaningful.

## Example of a behaviour coming back to normal after an abrupt change

Figure 1

### Raw series - Domestic billings in NZ

Domestic billings fell down during the lockdown



Source: Data and Statistics, RBNZ

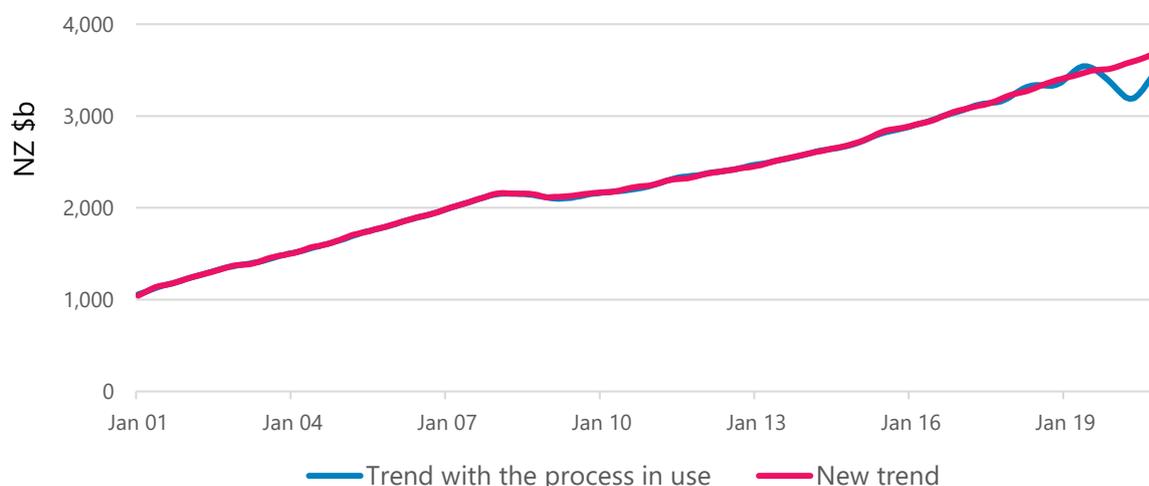
The period when Covid-19 has had a strong impact on domestic billings goes from March 2020 to August 2020. Since, the series has come back to both normal level and seasonal pattern, which means we can now consider Covid-19 effects as one-off here, rather than as long-term effects.

Applying the special treatment mentioned above, i.e. specifying the concerned data points as Additive Outliers, has a strong impact on the trends:

Figure 2

### Trend series - Domestic billings in NZ

In the absence of the special treatment, the trend series absorb Covid-19 effects



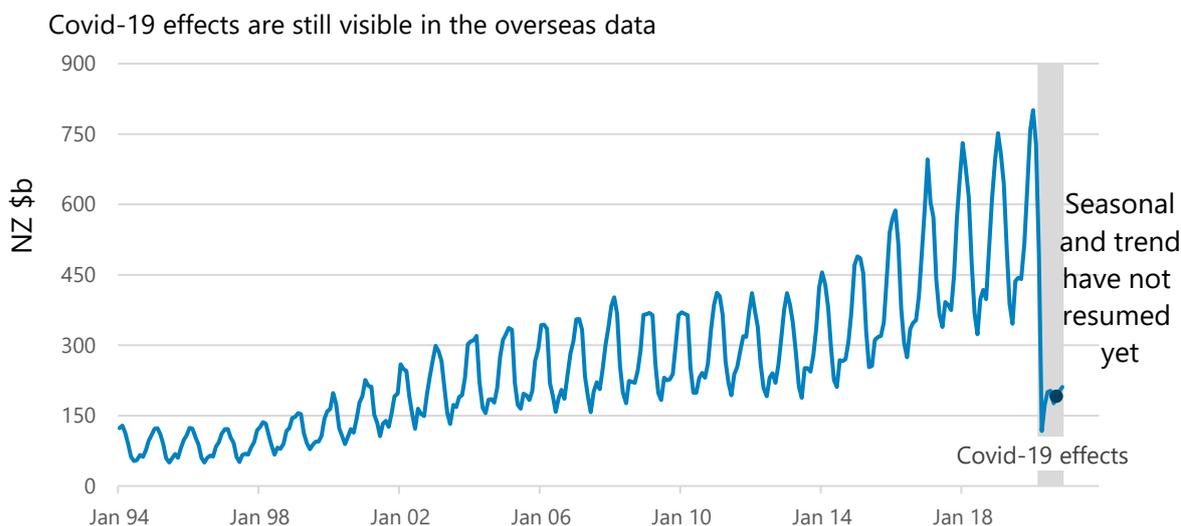
Source: Data and statistics, RBNZ

## Example of a behaviour still impacted by an abrupt change

Below is an example of a time series where both the trend and the seasonal pattern have strongly changed:

Figure 3

### Raw series - Overseas issued cards



Source: Data and Statistics, RBNZ

In this case, more information is needed before a treatment can be determined and we can publish seasonally adjusted series again<sup>ii</sup>. If trends and seasonal pattern return to normal, or establish a new pattern then, there are treatments that can be considered.

## Aggregated series

Until now, aggregated series were seasonally adjusted using the indirect approach, which consists in summing up its seasonally adjusted components. As we have suspended the seasonal adjustment of one component of our total series, the indirect method cannot be computed anymore.

However, in both cases – *total domestic billings in NZ* and *total billings on NZ cards* -, the component that we stop computing – *billings from international cards in NZ* and *overseas billings on NZ cards* -, never contributes more than 14% of the aggregate.

As a result, seasonality and trend of both total series have resumed, in the same way as the domestic component. Then, seasonally adjusting these series still makes sense. As a result, we will now use the direct approach, which consists of seasonally adjusting aggregated series directly.

<sup>i</sup> An additive outlier is a regression variable that plays an active role on one data point only.

<sup>ii</sup> Note a Level Shift outlier does not match the situation here, due to the loss of the seasonality pattern.