

Changes to the New Zealand Superannuation Fund (NZSF) model for the 2020 *Budget Economic and Fiscal Update* version

The 2020 *Budget Economic and Fiscal Update* New Zealand Superannuation Fund (NZSF) model includes a modelling assumption change from the previous version on the Treasury website, which was the 2019 *Half Year Economic and Fiscal Update* NZSF model.

The change involves the post-forecast projections of the gross annual rate of return on NZSF assets. This is now based on the parameters that the NZSF publishes in the *Statement of Estimated Fund Performance* section of its annual [Statement of Performance Expectations](#). The new projection technique is closely aligned to the logic used by the NZSF analysts in producing the forecasts of returns for the NZSF over the next five years

The parameters used in the *Statement of Estimated Fund Performance* are:

- a risk-free rate, which is the estimate of the equilibrium return on 90-day Treasury bills
- an excess return after costs; which is the reward for taking market risk above the risk-free rate, and
- a reward for value-adding activities.

These sum to produce an expected before-tax return. The modelling gradually reduces the “value add” component to zero over the 40 year horizon that the NZSF contribution rate legislated formula uses, as it is less certain that this additional return beyond market expectations could be maintained over the long-term horizon.

In producing forecasts to supply to the Treasury for Economic and Fiscal Updates, analysts at the NZSF base their return rate estimates on the parameters in their latest *Statement of Estimated Fund Performance*.

- The first, partially complete forecast year incorporates known outturns for the year.
- Beyond that point, and in particular for the final four forecast years, the return rate applied is based on the sum of the long-run assumptions for the risk-free rate, the excess return after costs and the reward for value-adding activities.
- The majority of the NZSF’s annual return in any year is comprised of valuation gains and losses on their assets, but these can vary widely from month to month, let alone over years, so basing the forecasts on an average, long-run expectation helps to smooth out the rises and falls that will, in reality, unfold across these years.

The previous modelling technique for the projected return on NZSF assets had been in place since the Budget 2013 version of the NZSF model. It added a fixed annual average return for taking market risk to the government 10-year bond annual return rate in that projected year. Due to prolonged expectations of low return rates on government 10-year bonds, there was a sizeable decline in return rates as the model moved from forecasts to projections.

There are significant error bounds involved with the NZSF model, because the contribution rate formula uses 40 year projections of several variables. However, all of the projections are constructed in a manner which attempts, given the data and knowledge available at the time, to follow a path that is balanced between both upside and downside risk.

The change to the model better aligns the projected return rate with the forecasts supplied by the NZSF analysts for the Economic and Fiscal Updates. Historically, realised NZSF returns have been close on average to the expected returns set out in the NZSF's *Statement of Performance Expectations*.

The effect of this change is to reduce the capital contributions, required by the legislated contribution rate formula, and increase withdrawals once they begin, while the projected NZSF size actually increases. The formula uses 40 year projected tracks of nominal GDP, NZS expenditure and the NZSF closing balance. Of these, the modelling change affects only the closing balance. The higher projected return increases the closing balance, which lowers the capital contribution calculated for the following year. This partially offsets the higher return in that year, so that over the 40 years the difference between the higher returns and the lower contributions, produced by the modelling change, gradually reduces. However, the cumulative impact of the differences is enough to result in a higher NZSF size throughout.

While the COVID-19 pandemic has caused much uncertainty and volatility in financial markets, as well as affected the path of GDP, and hence that of NZS expenses relative to GDP, this modelling change is in no manner connected to that. It has been researched and planned since September 2019, long before the pandemic surfaced. However, the NZSF's own Budget 2020 forecasts, which form the base of the projections in this version of the NZSF model, do build in the market volatility up to the time they were produced in the first forecast year. For the rest of the forecast years the NZSF analysts apply their long-run expectations and the new modelling technique does the same in the ensuing projected years. The previous method, being linked to government bond rates that will probably remain low for even longer now due to the pandemic, would have carried on the effects precisely in the years when the NZSF might well be experiencing a strong recovery as markets rebound.

In summary, this modelling change produces three main advantages. These are that it:

- produces a projection track of NZSF annual returns that is more balanced between downside and upside risk,
- is closely aligned to the logic used by the NZSF to produce forecasts of annual returns for the Budget and Half Year Economic and Fiscal Update publications, and
- removes the dependence of the NZSF model's projections on a projected track of the government 10-year bond rate, for which the uncertainty over time has increased, particularly in regard to estimating the number of years required to return to a long-run equilibrium value.

The graphs below, all shown in terms of percentage of nominal gross domestic product (GDP) and projecting out to the year ending 30 June 2060, indicate the effect that this modelling change has on three major NZSF components, namely the:

- size of capital contributions/(withdrawals)
- legislated contribution rate relative to net aggregate New Zealand Superannuation (NZS) expenses, and
- closing NZSF balance.



