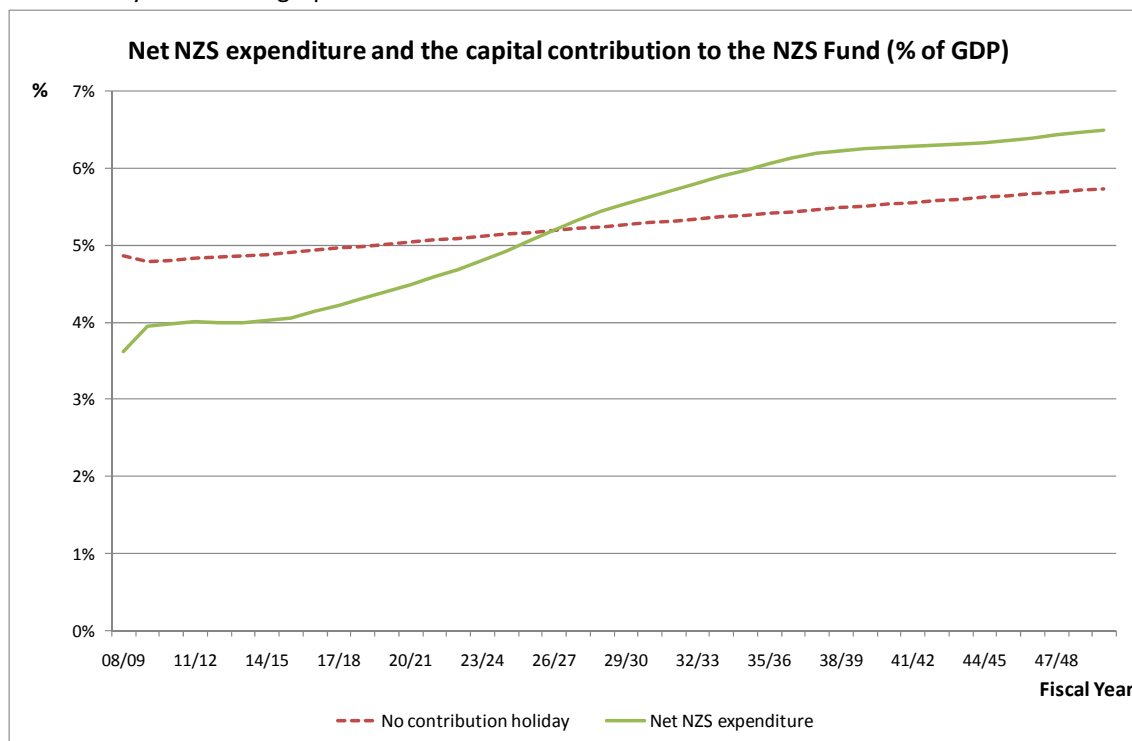


The impact of an eleven-year contribution holiday on the New Zealand Superannuation (NZS) Fund

This note provides background on the impact on the capital contributions and the size of the NZS Fund of the contribution holiday.

The NZS Fund seeks to smooth the amount spent on NZS (as a % of GDP) over a 40-year rolling horizon. This amount is made up of both actual NZS expenditure and the capital contribution to the NZS Fund.

The key NZS Fund formula smoothes this amount, as a % of GDP, over the funding horizon. This is most clearly shown in a graph:



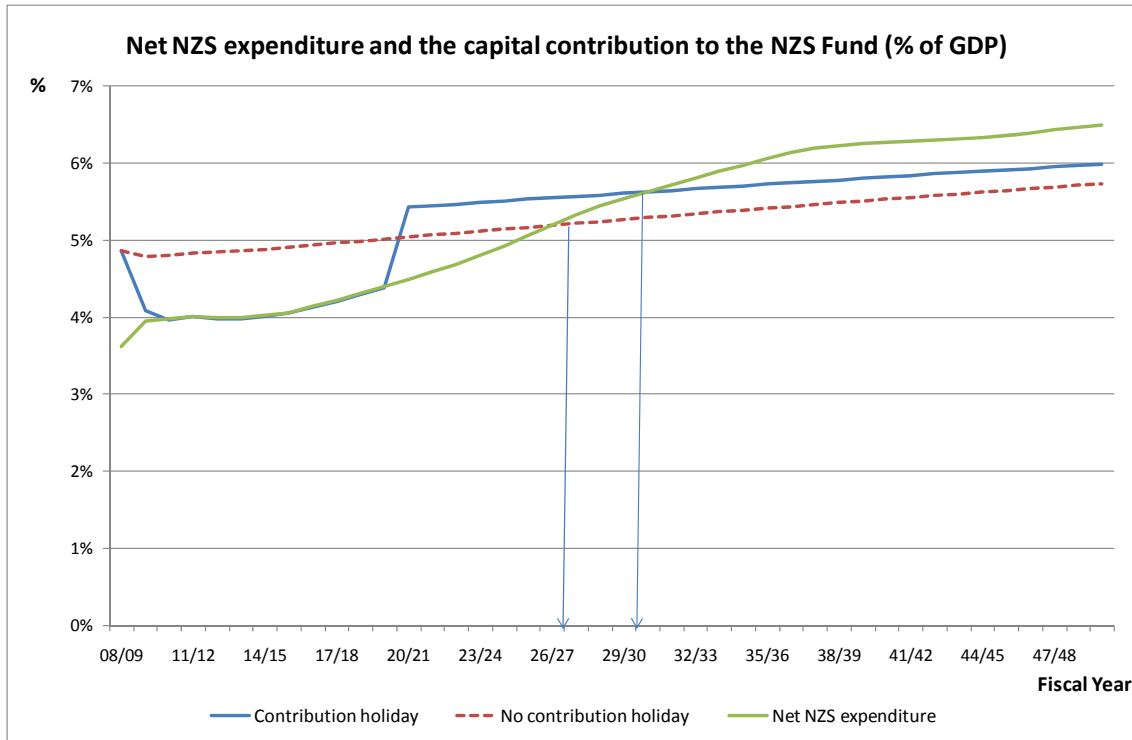
It is important to note that there is no 'target' for the size of the Fund, the formula aims to smooth the amount spent on NZS (as a % of GDP).

- The red line is equal to the smoothed amount: net NZS expenditure plus the capital contribution (or withdrawal), as a % of GDP.
- The green line is net NZS expenditure, as a % of GDP.
- The difference between the two lines is the capital contribution or withdrawal (as a % of GDP).

When the red line is above the green line, contributions to the Fund are positive, as net NZS as a % of GDP is at its lowest levels.

Net NZS expenditure increases as a % of GDP over time, due to the ageing population (from 3.6% of GDP in 2009 to 6.5% of GDP in 2050). Eventually the lines cross, as net NZS expenditure exceeds this 'smoothed' amount, and the contributions become withdrawals from the Fund.

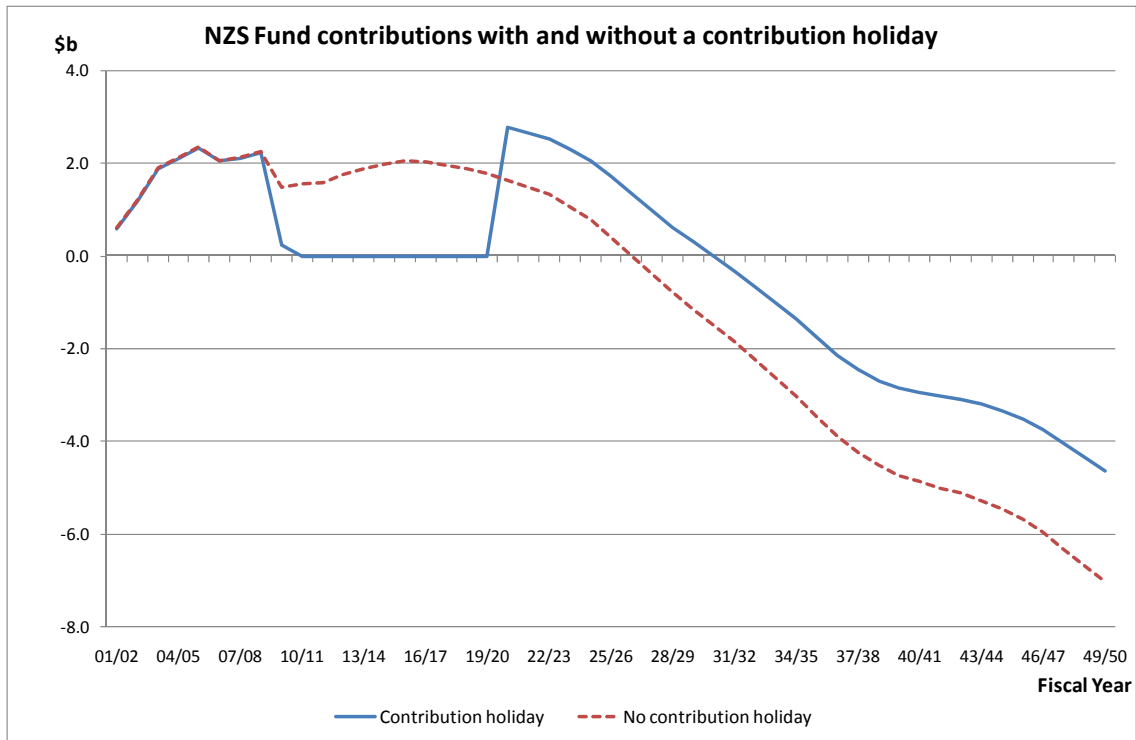
Contribution Holiday:



The green and red lines are as per the previous chart.

The blue line shows the 'smoothed' amount - net NZS plus the capital contribution, **with an eleven-year contribution holiday, and a one-off contribution of \$250m in 2009/10.**

- The gap between the blue line and the green line is the capital contribution in this scenario.
- When the capital contribution is set to zero for eleven years, the blue line is simply equal to net NZS expenditure (the green line).
- After the contribution holiday the contributions are required to be higher than in the no contribution holiday scenario (the blue line is higher than the red line).
 - This is because the balance of the Fund is now smaller than it would have been.
- Withdrawals from the Fund start three years later with a contribution holiday (2030/31 instead of 2027/28), as shown by the arrows in the graph above.
- The amount withdrawn is less in each year than would have been the case without a contribution holiday, as shown by the blue line being above the red line in the graph above.
 - This is partly because we start withdrawing later (effectively lagging the withdrawals).
 - But the smaller Fund in the contribution holiday scenario means that withdrawals are also smaller than they would have otherwise been.

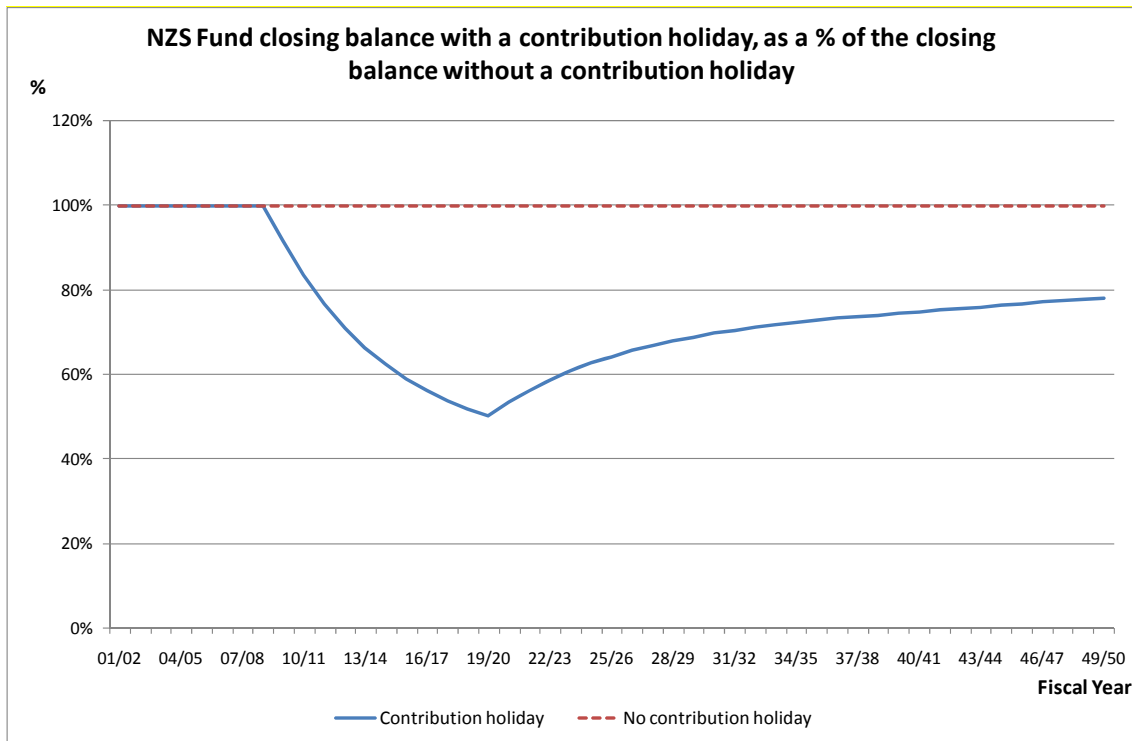


- The average contribution for the three years before the holiday was \$2.1 billion.
- The average contribution for the three years after the holiday is \$2.7 billion.
- In 2050, without a contribution holiday, the withdrawal from the Fund would have paid for 24% of the increase in net NZS expenditure (to GDP) compared to 2009 (or 11% of nominal net NZS expenditure in that year).
- In 2050, with an eleven-year contribution holiday, the withdrawal from the Fund would pay for 18% of the increase in net NZS expenditure (to GDP) compared to 2009 (or 8% of nominal net NZS expenditure in that year).

CONTRIBUTIONS	2009/10 to 2019/20	2020/21 to 2030/31
Contribution holiday	\$0.25 billion	\$17.3 billion
No contribution holiday	\$19.7 billion	\$4.3 billion
Difference	- \$19.5 billion	+ \$13 billion

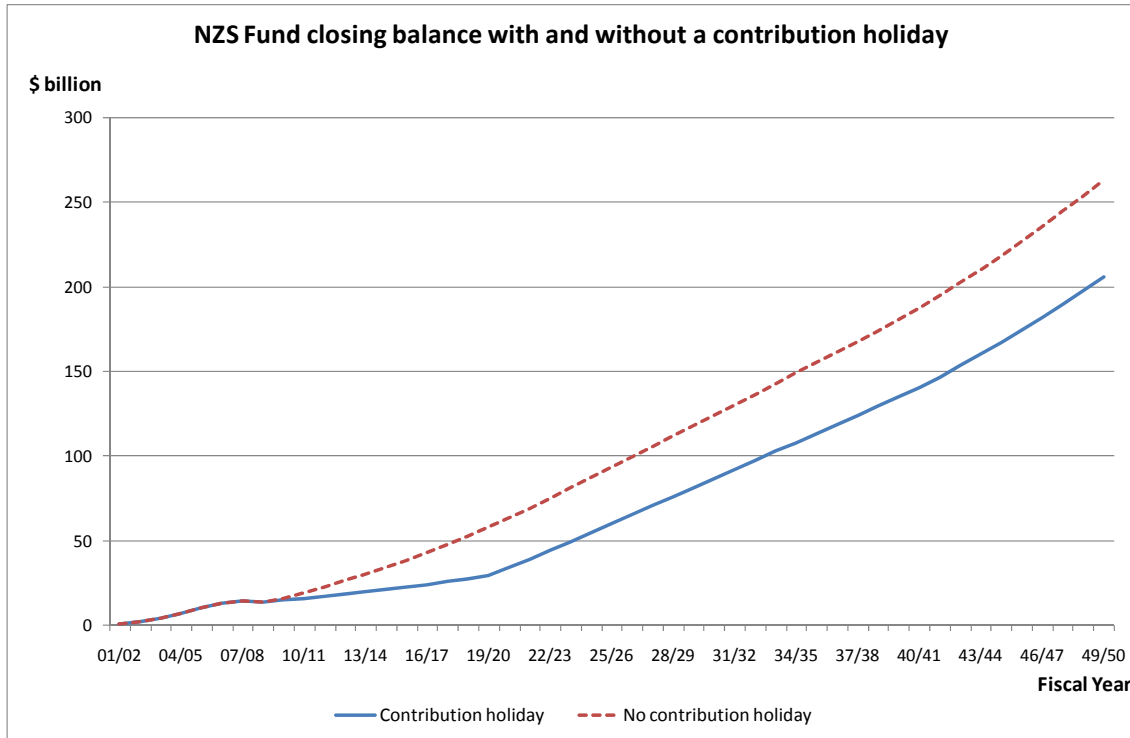
- The amount of forgone contributions is \$19.5 billion over the eleven years (in nominal terms).
- Until withdrawals start in 2030/31, contributions are \$13 billion higher than they would have been without a holiday (in nominal terms).

- These calculations exclude any returns earned on these contributions, and are not adjusted to reflect the time value of money. They are simply nominal calculations.
- These values can be found in: [Budget Economic & Fiscal Update \(BEFU\) 2009 New Zealand Superannuation \(NZS\) Fund Track](#) [MS Excel, 38 KB].



The closing balance of the NZS Fund does not fully recover to the level it would have been without a contribution holiday.

- The closing balance dips to 50% of what it would have been in 2019/20 (the final year of the contribution holiday), and then recovers to around 80% by the middle of the century.
- At the end of the projection period (2022/23) the closing balance is 59% of what it would have been without the contribution holiday.



- In nominal terms:
 - In 2022/23 the NZS Fund balance is \$31 billion smaller under the contribution holiday.
 - By 2050, the NZS Fund balance is \$58 billion smaller than it would have been without the contribution holiday.
- These values can be found in: [Budget Economic & Fiscal Update \(BEFU\) 2009 New Zealand Superannuation \(NZS\) Fund Track](#) [MS Excel, 38 KB].

These projections of the NZS Fund are based on Budget Economic and Fiscal Update (BEFU) forecasts and assumptions. These forecasts and assumptions will be updated again at the Half-Year Economic and Fiscal Update (HYEFU), and the projections will consequently change.

Technical Annex:

There is one formula at the heart of the NZS Fund model, and all other calculations in the model derive from this. The formula is a smoothing algorithm that calculates the annual capital contribution, in any given year j , as a percentage of nominal GDP. It is:

$$\text{CC \& NZS (\% GDP) year } j = \frac{\text{NPV}_{r,\text{FH}}\{\text{net NZS expenditure}\} - (\text{NZSF balance in year } j-1) \div (1+v)}{\text{NPV}_{r,\text{FH}}\{\text{nominal GDP}\}}$$

Where:

CC & NZS (% GDP) year j = capital contribution plus net NZS expenditure as a % of GDP in year j ;

NPV = net present value;

FH = funding horizon (normally set to 40 years);

r = the after-tax nominal annual rate of return (the discount rate); and

v = after-tax in-year compound return using fortnightly payments

This key formula sets an annual amount (made up of the annual required capital contribution plus the annual net NZS expenditure) for a year at a level such that, if that same % of nominal GDP was contributed to the Fund each year over the funding horizon, the Fund balance (plus accumulated returns) would be expected to be sufficient to cover net NZS expenditure over the funding horizon.

- When this smoothed amount, CC & NZS (% GDP), is greater than net NZS expenditure-to-GDP, the capital contributions are positive.
- When this smoothed amount, CC & NZS (% GDP), becomes less than net NZS expenditure (% GDP), as net NZS expenditure (%GDP) grows through time due to an ageing population, the capital contributions become negative (withdrawals from the NZS Fund).

Contribution holiday:

- The eleven-year contribution holiday from the NZS Fund only changes one component in the formula above, the closing Fund balance in the previous year.
- As the Fund balance is lower with a contribution holiday, this means that the smoothed amount, CC & NZS (% GDP), is higher.
 - As the net NZS expenditure (% GDP) component of this is unchanged, this implies bigger positive capital contributions and conversely, smaller (negative) withdrawals from the Fund.
 - As the smoothed amount is higher, and net NZS expenditure (% GDP) is unchanged, it takes longer for net NZS expenditure (%GDP) to overtake the smoothed amount. This means that withdrawals from the Fund start later with a contribution holiday than without.