

Projection Assumptions to 2036/37

2022 Half Year Economic and Fiscal Update of the Fiscal Strategy Model (FSM)

14 December 2022

This version of the Fiscal Strategy Model uses economic and fiscal forecasts prepared for the 2022 *Half Year Economic and Fiscal Update (HYEFU)*. The projection period begins in 2027/28 and extends a decade to 2036/37. These post-forecast fiscal projections are based on the long-run technical and policy assumptions outlined below.

The Fiscal Strategy Model (sometimes referred to by the acronym FSM) that produces the projections can be found on the Treasury website at <https://treasury.govt.nz/government/fiscalstrategy/model>

Forecasts attempt to predict future outcomes by using wide-ranging resources, comprehensive modelling and expert opinion and knowledge. Projections, which arise from and are heavily influenced by their forecast base, are potential paths. These paths are based on trend or long-run averages for growth rates or levels of key economic, fiscal and demographic variables, and generally assume no policy changes beyond those built into their forecast base.

Economic projections and assumptions

Table 1 displays the macroeconomic projections from the 2022 HYEFU Fiscal Strategy Model.

Table 1 – Summary of economic projections¹

Year ending 30 June	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037
	Forecasts					Projections						
Labour force	1.3	0.3	1.1	1.4	1.4	1.1	1.1	1.0	0.9	0.9	...	0.6
Unemployment rate ²	3.5	4.9	5.4	4.8	4.4	4.3	4.3	4.3	4.3	4.3	...	4.3
Average weekly hours worked ³	33.6	33.6	33.6	33.7	33.7	33.7	33.7	33.7	33.7	33.7	...	33.7
Labour productivity growth ⁴	0.3	1.0	1.4	1.1	1.2	1.1	1.1	1.0	1.0	1.0	...	1.0
Real GDP ⁵	3.5	-0.3	2.1	3.3	3.0	2.5	2.1	2.0	1.9	1.9	...	1.6
Nominal GDP ⁶	9.8	4.5	5.5	5.7	5.2	4.6	4.2	4.1	4.0	3.9	...	3.7
Consumers Price Index (annual percentage change)	6.4	3.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	...	2.0
Government 10-year bonds (average percentage rate)	4.4	4.8	4.7	4.5	4.2	4.3	4.3	4.3	4.3	4.3	...	4.3
Average hourly wage	7.4	6.3	5.3	4.3	3.9	3.2	3.1	3.0	3.0	3.0	...	3.0

Notes:

- 1 Annual average percentage change unless otherwise stated
- 2 Total unemployed as a percentage of the labour force (annual average)
- 3 Average weekly hours worked (total hours worked ÷ total employed labour force)
- 4 Average annual growth in real GDP divided by total hours worked
- 5 Production measure, 2009/10 base
- 6 Expenditure measure

Sources: The Treasury, Statistics New Zealand

Most economic variables are close to their assumed long-run trend growth rates or levels by the end of the forecast. If they differ from this assumption by the final forecast year, then they are transitioned to attain it over the early projected years. The annual convergence rate assumed is based on recent actual and forecast performance. Table 2 reports the five economic variables for which stable assumptions are made and the projected year in which they attain these in the 2022 HYEPU Fiscal Strategy Model.

Table 2 – Economic variables with long-run stable assumptions and year of attainment

Economic variable	Stable assumption	End-of-forecast value	Projected yearattained
Unemployment rate	4.25%	4.43%	2027/28
Average weekly hours worked	33.7	33.7	2027/28
Labour productivity annual growth	1.0%	1.2%	2029/30
Consumers Price Index (CPI) annual growth (inflation measure)	2.0%	2.0%	2027/28
Government 10-year bond annual return rate	4.3%	4.2%	2027/28

Source: The Treasury

Projected real GDP grows from its forecast base via the annual combined change in the size of the employed labour force, the average hours they work and their productivity. Once the latter two variables, as well as the unemployment rate, stabilise in projected years the only variation in projected real GDP arises from that of the labour force. Statistics New Zealand’s population and labour force projections are used in projecting out the labour force’s size and annual growth.

Growth in nominal GDP in each projected year is achieved by adding CPI-based inflation to the real GDP growth. The long-run stable assumption for CPI inflation of 2 per cent per year matches the midpoint of the band set in remit for the Monetary Policy Committee. Nominal GDP growth is used to project many fiscal variables, including tax revenue. It is also the denominator for most major fiscal indicators, such as net debt to GDP.

Fiscal projections and assumptions

Fiscal projections have changed from those published as part of the 2022 *Budget Economic and Fiscal Update* (BEFU) version of Fiscal Strategy Model. This reflects changes in the economic and fiscal forecast bases of the projections, as well as changes in assumptions and modelling logic. More detail on the contribution from each of these sources is given in the next section of this note.

Table 3 reports the fiscal projections from the updated Fiscal Strategy Model, projecting onward from the fiscal forecasts for 2022/23 to 2026/27. With the stronger forecast end-period the fiscal outlook for the projection period has improved. While both revenues and expenses are higher, the increase in revenue is stronger overall, producing stronger operating balances throughout the projection period. In turn, this has resulted in lower net debt, lower interest expenses, and a stronger net worth position relative to the 2022 *Budget Economic and Fiscal Update*.

Table 3 – Summary of fiscal projections, as percentages of nominal GDP

Year ending 30 June	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2037
	Forecasts					Projections						
Core Crown revenue	33.0	33.3	33.2	33.5	33.4	33.3	33.2	33.0	32.9	32.7	...	32.2
Core Crown expenses	32.8	32.6	32.2	31.5	30.9	31.0	31.0	30.9	30.8	30.7	...	30.3
Core Crown residual cash	-6.4	-4.3	1.7	1.0	1.3	0.5	0.6	0.6	0.6	0.7	...	1.1
Total Crown revenue	40.4	41.1	41.1	41.6	41.4	41.3	41.2	41.0	40.9	40.8	...	40.2
Total Crown expenses	41.3	41.1	40.6	40.2	39.4	39.2	39.2	39.1	38.9	38.8	...	38.0
Total Crown OBEGAL ¹	-0.9	-0.1	0.4	1.4	1.9	2.0	1.9	1.9	1.9	1.9	...	2.1
Total Crown operating balance ²	-0.2	1.3	1.7	2.7	3.3	3.4	3.3	3.4	3.4	3.5	...	3.8
Net debt ³	19.9	21.4	19.1	17.1	14.1	11.5	9.2	7.0	4.8	2.7	...	-7.6
Net core Crown debt ⁴	39.2	41.8	38.1	35.2	32.2	30.2	28.4	26.7	25.0	23.4	...	15.1
Total Crown net worth	44.0	43.4	42.8	43.2	44.4	45.8	47.3	48.9	50.4	52.0	...	60.3
Net worth attributable to the Crown ⁵	42.1	41.5	41.1	41.6	42.9	44.2	45.7	47.3	48.8	50.4	...	58.7

Notes:

- 1 Operating balance before gains/(losses)
- 2 Excludes minority interests
- 3 Includes Crown entity borrowings and financial assets of the NZS Fund and core Crown advances
- 4 Excludes financial assets of the NZS Fund and core Crown advances and excludes Crown entity borrowings
- 5 Excludes assets and liabilities belonging to minority interests

The assumptions underpinning the projections are reported in Table 4.

Table 4 – Summary of fiscal assumptions

Tax revenue	Linked to growth in nominal GDP. Each of the six major tax types, as well as the inter-segment elimination between core Crown and total Crown tax, moves from its end-of-forecast percentage of GDP towards a stable percentage of GDP, based on the average for the tax type over the five forecast years and the previous four outturn (historical) years. A transition rate of 0.05 percentage points of GDP is used for all of the tax types.
New Zealand Superannuation (NZS)	Demographically adjusted and linked to net wage growth, via the “wage floor”. The latter refers to the net (after-tax) weekly NZS rate for a couple as set in legislation to lie between 66 per cent and 72.5 per cent of net (after tax) average ordinary time weekly earnings.
Jobseeker Support, Supported Living Payment and Sole Parent Support	The three main working-age benefits are grown via demographic adjustment of recipient numbers and net average wage growth for payment rate indexation. For Jobseeker Support, which is the most sensitive in terms of recipient numbers to economic conditions, modelling is incorporated to reduce or increase recipient growth in early projected years if recipient numbers are considered to be unusually high or low at the end of the forecast period.
Other benefits	These are projected in the same way as tax revenue types, and the same transition rate is also applied.
Other expenditure	Most expense categories, such as health, education, core government services, etc., are held constant in projected years at their end-of-forecast values. This is because their growth is assumed to come from a share of the projected Operating Allowance annual increment. A notable exception is transport expenditure, which is funded from hypothecated transport taxes and hence is projected in line with that tax type’s growth. A few small components of expenses, like Student allowances in Education, are projected by some form of growth driver, rather than kept constant, because they are not funded from the Operating Allowances.
Finance costs	A function of debt levels and interest rates.
Operating allowance	\$3.0 billion in 2027/28. Operating Allowances continue to grow at 2 per cent per annum from this value in later projected years.
Capital allowance	\$7.0 billion in 2027/28. Capital Allowances continue to grow at 2 per cent per annum from this value in later projected years.
New Zealand Superannuation Fund (NZSF)	Contributions to the NZSF follow the legislated formula and are calculated by the Treasury’s NZSF model using the 2022 HYEPU economic and fiscal forecast inputs.

The contribution of forecasts and modelling assumptions to changes in the projections

This section provides information about the respective roles of revised forecasts and revised modelling assumptions in terms of their contributions to the changes in the fiscal projections from those produced by the 2022 *Budget Economic and Forecast Update* Fiscal Strategy Model.

The changes in the fiscal projections largely reflect changes in their economic and fiscal forecast bases. However, the projections have also been influenced by changes that have been introduced in this 2022 HYEPU version of the Fiscal Strategy Model to improve the modelling of total Crown debt. The relationship between core Crown and total Crown debt is relatively stable in history, and this is maintained in forecasts too. The modelling logic and assumption changes made in this version of the Fiscal Strategy Model have primarily been made to ensure that Core Crown and Total Crown debt remain in a fairly stable proportion to one another over projections too.

In recent Economic and Forecast Updates total Crown OBEGAL has tended to reduce over the projections, both in nominal dollars and as a percentage of nominal GDP. However, updating the Fiscal Strategy Model with the 2022 HYEPU economic and forecast base, as well as updated demographic projections from Statistics New Zealand and HYEPU-based exogenous tracks from various public agencies, has actually led to the projected OBEGAL track gradually lifting, as a percentage of nominal GDP. Introducing the modelling changes to better reflect the relationship of total Crown debt to core Crown debt over the projections has had the opposite, albeit much smaller, effect to that of the forecast base changes, resulting in a relatively stable OBEGAL to GDP projected track. Overall, the improved forecast outlook's effect has outweighed the impact of the revised modelling assumptions on OBEGAL as a percentage of GDP over the projection horizon.

To summarise the main points of the previous paragraph:

- Updating the forecast bases and exogenous tracks of the Fiscal Strategy Model, including the size and growth of operating and capital allowances, while retaining all projection logic, has changed the projected OBEGAL to GDP track from declining to slightly rising.
- Updating the modelling assumptions in the Fiscal Strategy Model has reversed some of the increase in the OBEGAL track as a percentage of GDP, to the point where it is relatively flat, although OBEGAL surpluses are still increasing in nominal dollar terms.

Table 5 illustrates the differences to the OBEGAL projection resulting from purely updating the economic, fiscal and demographic forecast bases and exogenous tracks from their 2022 Budget values to their 2022 HYEPU values. Projection assumptions and modelling logic are unchanged.

Table 5 – Drivers of change in OBEGAL from updating forecast bases and exogenous tracks

Fiscal variable	2021/22		...	2026/27		2027/28		...	2031/32		...	2035/36	
	\$b	%		\$b	%	\$b	%		\$b	%		\$b	%
Tax revenue	4.71	1.31	...	4.52	0.93	4.95	0.98	...	6.00	1.01	...	7.02	1.02
Interest revenue	0.08	0.02	...	2.76	0.57	0.90	0.18	...	1.16	0.20	...	1.52	0.22
Other revenue	1.05	0.29	...	-0.44	-0.09	2.94	0.58	...	4.30	0.73	...	5.07	0.74
REVENUE	5.83	1.62	...	6.84	1.41	8.79	1.74	...	11.47	1.93	...	13.61	1.98
Welfare expenses	-0.66	-0.18	...	0.28	0.06	0.41	0.08	...	-0.04	-0.01	...	-0.84	-0.12
Interest expenses	-0.01	-0.00	...	3.57	0.74	1.89	0.37	...	-1.63	-0.27	...	-4.87	-0.71
Other expenses	-6.35	-1.77	...	-1.28	-0.26	0.04	0.01	...	-0.41	-0.07	...	-1.31	-0.19
Operating allowances	3.56	0.99	...	2.02	0.42	1.16	0.23	...	0.99	0.17	...	0.80	0.12
EXPENSES	-3.46	-0.96	...	4.58	0.95	3.51	0.69	...	-1.09	-0.18	...	-6.21	-0.90
OBEGAL	9.29	2.58	...	2.25	0.47	5.29	1.04	...	12.56	2.12	...	19.82	2.88

The fiscal year 2021/22 (year ending 30 June 2022) was a forecast one at Budget 2022 but is an outturn year in the HYEPU projection, and 2026/27 was the first projected year at Budget but is now the final forecast year. The last point is particularly relevant, as forecast variables are exogenous inputs in the Fiscal Strategy Model, while projected years are modelled.

Table 5 reports the difference, expressed for each variable as the difference between the updated projection and that of the 2022 Budget Fiscal Strategy Model, in billions of nominal dollars and as a percentage of GDP. The updated nominal GDP is used as the denominator for both, although it does not differ markedly from the Budget GDP projection. The years listed are the last outturn and forecast years for the updated Fiscal Strategy Model (first forecast and projected years for Budget respectively), and the first, fifth and ninth projected year for the updated Fiscal Strategy Model (the latter being the last projected year for the 2022 Budget Fiscal Strategy Model).

The following bullet points outline the changes to each line item, based on the HYEPU forecasts.

- **Tax revenue** – Begins around a percentage point of GDP higher at the end of the forecast years; and the projection logic largely maintains this wedge over the projections.
- **Interest revenue** – Slightly higher at the end of the forecast years and slightly higher over the projection period.
- **Other revenue** – A higher forecast base of revenue from *Sales of goods and services* is carried out into projections and there is also a little stronger dividend revenue.
- **Welfare expenses** – These are not greatly different but the weaker forecasts of welfare expenses flow into the projections.
- **Interest expenses** – Total Crown gross debt is similar to the 2022 Budget level in the last forecast year of the updated Fiscal Strategy Model, but interest rates are higher. In the projection period the stronger OBEGAL values lower the borrowing relative to Budget and interest expenses on this lower debt level also decline.
- **Other expenses and Operating allowances** – The former have a big impact on reducing OBEGAL in the actual outturn year of 2021/22, but neither have much impact on projections.

As has been explained, projection modelling logic and assumption changes have been introduced in the 2022 *Half Year Economic and Fiscal Update* Fiscal Strategy Model in order to make the projected relationship of total Crown debt to core Crown debt more stable, as it is in historical outturns and forecasts. In particular the following changes were made:

- More growth of core Crown assets, and to a lesser extent Crown Entities assets, is assumed to be derived from the projected capital allowances.
- Some Crown Entities revenue and expense categories had their projected growth adjusted to better align the projected growth of total Crown debt relative to that of core Crown debt.

Table 6 is similar to Table 5, except this time it shows the drivers of the change for projected OBEGAL between the Fiscal Strategy Model that was updated with 2022 HYEPU forecast bases and exogenous tracks, but no changes from the projection modelling logic or assumptions used in the Budget model, and the full 2022 HYEPU Fiscal Strategy Model with these changes. Both models have the same forecast bases and exogenous tracks, so all differences are due to these modelling changes. Only projection years are shown because 2021/22 and the forecast years are identical for both models. The final projected year, 2036/37, has been added, which was not in Table 5 as it was beyond the 2022 Budget Fiscal Strategy Model's projection horizon.

Table 6 – Drivers of change in OBEGAL from revised modelling logic and assumptions

Fiscal variable	2027/28		...	2031/32		...	2035/36		2036/37	
	\$b	%		\$b	%		\$b	%	\$b	%
Tax revenue	-0.20	-0.04	...	-1.07	-0.18	...	-1.00	-0.14	-0.93	-0.13
Interest revenue	1.81	0.36	...	1.43	0.24	...	0.62	0.09	0.39	0.06
Other revenue	-3.25	-0.64	...	-4.28	-0.72	...	-5.26	-0.77	-5.54	-0.78
REVENUE	-1.64	-0.32	...	-3.92	-0.66	...	-5.64	-0.82	-6.08	-0.85
Welfare expenses	0.67	0.13	...	1.70	0.29	...	2.57	0.37	2.77	0.39
Interest expenses	-0.11	-0.02	...	-1.01	-0.17	...	-1.83	-0.27	-2.04	-0.29
Other expenses	-1.29	-0.25	...	-1.84	-0.31	...	-2.60	-0.38	-2.81	-0.39
Operating allowances	0.90	0.18	...	0.90	0.15	...	0.90	0.13	0.90	0.13
EXPENSES	0.16	0.03	...	-0.25	-0.04	...	-0.95	-0.14	-1.18	-0.16
OBEGAL	-1.81	-0.36		-3.67	-0.62		-4.68	-0.68	-4.91	-0.69

Table 6 shows modelling assumptions reduce total Crown revenue more than they reduce total Crown expenses. The following bullet points outline the main changes to the Fiscal Strategy Model modelling logic and assumptions in projected years.

- **Tax revenue** – The projection of each of the six major tax types is now based on each one's average percentage of GDP over the forecast years and last four outturn years, rather than on a purely historical average, which slightly reduces tax growth.
- **Interest revenue** – Weaker asset base growth results in lower base of financial assets to generate interest revenue as projections progress.
- **Other revenue** – Reductions in growth assumptions to revenue types like *Sales of goods and services* is behind the most significant reduction in projected revenue.
- **Welfare expenses** – Welfare expenses have been increased by modelling changes. Transfers like Working for Families and Accommodation Supplement are now modelled in the same way that the tax types are. This change was introduced because these welfare types have neither obvious demographic recipient groups nor a fixed annual indexation regime to drive their growth, unlike New Zealand Superannuation or Jobseeker Support.
- **Interest expenses** – Despite weaker OBEGAL growth, changed assumptions about asset growth mean total Crown gross debt grows more slowly and so interest costs are lower.
- **Other expenses** – Reduction in other expenses is mainly a result of flattening the depreciation costs track, which previously grew significantly with the strong growth built into non-core Crown property, plant and equipment assets. To stabilise the Total Crown debt track relative to the core Crown one, non-core Crown property, plant and equipment growth has been significantly reduced and with it the growth of depreciation costs.
- **Operating allowances** – A top-down adjustment that dampened growth in projected operating allowances was removed. Removing this enables more symmetry between the manner in which projected growth in operating and capital allowances are modelled.