



TE TAI ŌHANGA
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Updating the methodologies for the cyclically-adjusted balance, structural balance and fiscal impulse

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<https://treasury.govt.nz/publications/guide/methodologies-cyclically-adjusted-structural-balance-fiscal-impulse>

Purpose

This note documents a set of changes to the method for calculating the *cyclically-adjusted balance* and *structural balance*. It also discusses the replacement of the *fiscal impulse* with a new *total fiscal impulse* measure. The Treasury intends to implement these changes in the Half Year Economic and Fiscal Update (HYEFU) 2021.

The cyclically-adjusted and structural balances

The Treasury calculates a number of fiscal indicators, which help measure fiscal sustainability. Two of these measures are the cyclically-adjusted balance (CAB) and the structural balance. Other indicators include *net core Crown debt*, and the *operating balance before gains and losses* (OBEGAL).¹ As signalled in the Budget Economic and Fiscal Update (BEFU) 2021, the Treasury is separately reviewing the headline fiscal indicators to ensure they remain fit-for-purpose.

The CAB adjusts OBEGAL to strip out the effects of the cyclical position of the economy.² When the economy is operating above its potential level (a positive output gap), OBEGAL reflects higher tax revenues and lower welfare expenses relative to when the economy is operating at potential. When the economy is operating below its potential level, the opposite is true. These changes in tax revenue and welfare expenses in response to the economic cycle are known as automatic stabilisers. To adjust for this cyclical position, the CAB removes these automatic stabilisers from OBEGAL.

The CAB is primarily used as an indicator of medium-term fiscal sustainability. Papers that discuss the CAB extensively include Blanchard (1990) and Parkyn (2010).

The structural balance is the CAB excluding one-off items such as the Canterbury earthquake costs, the Wage Subsidy Scheme, and vaccine purchases. Removing these items aims to provide a better measure of medium-term fiscal sustainability by only including 'business as usual' day-to-day expenditure.

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- 1 OBEGAL represents total Crown revenue less total Crown expenses excluding minority interest share.
 - 2 The CAB is subject to uncertainty because it uses estimated variables and is sensitive to new information, particularly regarding the output gap.

Methodology changes for the cyclically-adjusted and structural balances

The Treasury intends to update the method for producing the CAB and structural balance at HYEPU in December 2021. Relative to the BEPU in May 2021, the changes include:

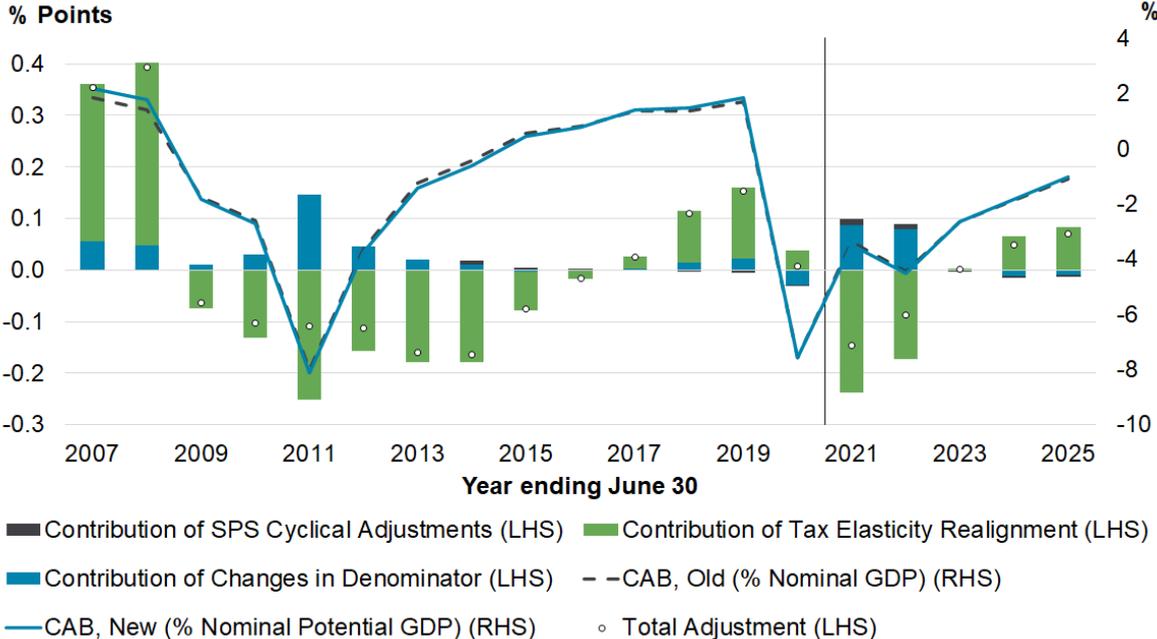
1. Realigning the Treasury's tax categories to international standards, resulting in the application of new elasticities (ie, estimates of the effects of the economic cycle) for individual income tax revenues, withholding tax revenue, and other revenues (comprising mainly revenue from Crown entities and State-owned Enterprises).
2. Applying a cyclical adjustment factor to Sole Parent Support (SPS) payments, given that SPS historically has shown sensitivity towards the economic cycle.
3. Presenting the indicators as a percentage of nominal potential GDP, rather than nominal GDP. The use of potential GDP is more consistent with international practice.

The method used to calculate the structural balance at HYEPU 2020, under which all COVID-19 Response and Recovery Fund (CRRF) expenditure and all earthquake expenses were excluded, was unable to be used at BEPU 2021. This was due to challenges around identifying individual items of CRRF expenditure in the Crown accounts. In addition to changes 1-3 above, the Treasury will change the methodology for producing the structural balance by:

4. Setting out explicit criteria to guide decisions about which one-off items to exclude from the structural balance. While judgement will still be required, we propose to exclude revenue or expenses from the structural balance if they:
 - i. have a significant impact on OBEGAL (a total impact of 0.5% of GDP or more across all affected years);
 - ii. are individually identifiable in the government's financial statements; and
 - iii. are one-off items, or are due to changes in accounting treatment and therefore have no underlying cashflow impact.

These four changes are explained in further detail below. A comparison of the new and old CAB measures, including the magnitude of each change, is illustrated in Figure 1.

Figure 1 – Decomposing the differences between the old and new CAB using BEFU 2021 data



Source: The Treasury

1. Realigning the Treasury’s tax categories to international standards

To remove the effects of the economic cycle on the government’s budget balance, the Treasury uses the disaggregated approach published by the OECD (Price, Dang and Botev, 2015) and the European Commission (Mourre, Astarita and Princen, 2014). The disaggregated approach involves calculating the cyclically-adjusted revenue and expenditure by multiplying the actual revenue with a cyclical adjustment factor based on elasticities for individual revenue and expenditure sources, rather than aggregate revenues and expenditures. These cyclically-adjusted amounts are then deducted from the operating balance to provide an estimate of the CAB. This is the preferred approach if sufficiently disaggregated data is available as it allows for differing sensitivities to the economic cycle (Bornhorst et al., 2011).

The elasticities reflect the historical responsiveness of revenue components to movements in economic activity. As with any elasticity estimates, they are open to considerable debate and uncertainty.

There is a further challenge in the application of elasticity estimates due to the OECD’s tax categories differing from those used in New Zealand. The Treasury’s new methodology updates the alignment of three of New Zealand’s tax categories to those used by the OECD (Price, Dang and Botev, 2015). The OECD incorporate earnings, self-employment income, and capital income under ‘personal income’. However, in New Zealand, income tax refers only to earnings and self-employment income, and we separate tax on capital income as ‘withholding tax’.

The new elasticity applied to individual income tax in Table 1 can be found by disaggregating the elasticity for each income tax subtype and calculating the weighted average of earnings and self-employment income. The OECD’s capital tax elasticity estimate is then applied to

withholding tax. The updated elasticity for 'other revenues', from 1 to 0, is based on the statistical insignificance of non-tax revenue to the output gap in New Zealand (Price, Dang, Botev, 2015). Earlier elasticity estimates from the OECD did not explore the relationship between non-tax revenues and the output gap.

These changes to the methodology reflect the OECD's updated calculation of aggregate personal income tax elasticities that separately identify the major tax base components of personal income: earned income, self-employment income, and capital income. In the OECD's 2005 publication, only taxes on wages were considered (Price, Dang and Botev, 2015). The updated elasticities more accurately reflect the greater sensitivity of withholding tax to the economic cycle and the lower sensitivity of individual income and self-employment income tax. The overall impact on the CAB is small but it will now reflect these variations between tax types.

Table 1 – Changes to elasticity parameters

	New elasticities	Old elasticities
Tax sources		
Individual income tax	1.02	1.23
Corporate tax	2.38	2.38
Withholding/Other direct tax	2.49	1.00
GST	1.32	1.32
Other indirect tax	1.00	1.00
Other revenues	0.00	1.00

Source: The Treasury, Price, Dang and Botev (2015)

2. Applying a cyclical adjustment factor to SPS payments

Not all categories of government expenditure are cyclically-adjusted, reflecting the discretionary nature of most government expenditure. The Treasury assumes that cyclically-adjusted unemployment expenditure moves proportionally to the unemployment gap (the ratio of unemployment to trend unemployment). The Treasury applies trend unemployment estimates from Matai (Treasury's forecasting model) to Jobseeker Support (JS) payments.

The Treasury's new methodology also includes the cyclical adjustment of SPS alongside the current JS payments.³ SPS numbers have historically shown some cyclical behaviour because sole parents have some attachment to the labour market. Removing these cyclical effects from the CAB and structural balance provides a more accurate picture of the government's underlying fiscal performance. SPS payments are adjusted based on the elasticity of social benefits relative to the output gap of -1.09, as estimated by the OECD (Price, Dang and Botev, 2015).

3 The Ministry of Social Development assumes both the number of people on JS and, to a lesser extent, SPS are sensitive to the economic cycle when forecasting future government expenditure.

3. Presenting the indicators as a percentage of nominal potential GDP

In previous publications, the Treasury has presented the indicators as a percentage of nominal GDP. The CAB and structural balance are now calculated as a percentage of nominal potential GDP. This better reflects the method used by the OECD and IMF (Schinasi and Lutz, 1991). The use of nominal potential provides more consistency with international best practice and with the estimates used to cyclically adjust government expenses and revenues.

Using nominal GDP as the denominator for these indicators assumes that revenues and expenditures grow with the size of the economy. Cyclical fluctuations in nominal GDP can introduce noise into the CAB and structural balance during periods with a large output gap, such as sharp recessions. These fluctuations may impact the interpretation of the indicators as measures of medium-term sustainability.

The Treasury's updated methodology for producing the CAB and structural balance calculates nominal potential GDP by applying the real output gap to nominal GDP.⁴ Alternative methods of producing a nominal potential GDP figure have been considered by the Treasury, including applying a Hodrick-Prescott (HP) filter to nominal GDP to create a 'trend nominal' series.

4. Setting out explicit criteria to guide judgements about which one-off impacts to exclude from the structural balance

The Treasury's old method for calculating the structural balance relies on ad hoc judgements when identifying one-off items. This leads to inconsistent judgements over time. Under the old approach, most expenses associated with the Canterbury and Kaikoura earthquakes were excluded. In addition, at the onset of COVID-19, we excluded all expenditure allocated to the CRRF and the initial COVID-19 Response package announced on 17 March, a total of \$62 billion.

However, because a large quantity of CRRF spending was allocated to existing appropriations, we are no longer able to specifically identify it in the Crown accounts. Further, the treatment of the CRRF at the HYEUFU 2020 was inconsistent with some historic events that also had a one-off impact, such as accounting treatment revaluations.

The Treasury has developed a new set of criteria to address these issues and guide its judgements about which one-off impacts to exclude from the structural balance. The criteria draw on the general principles set out by the OECD (Journard et al, 2008) and European Commission's (2007) frameworks to address one-off impacts on the operating balance.

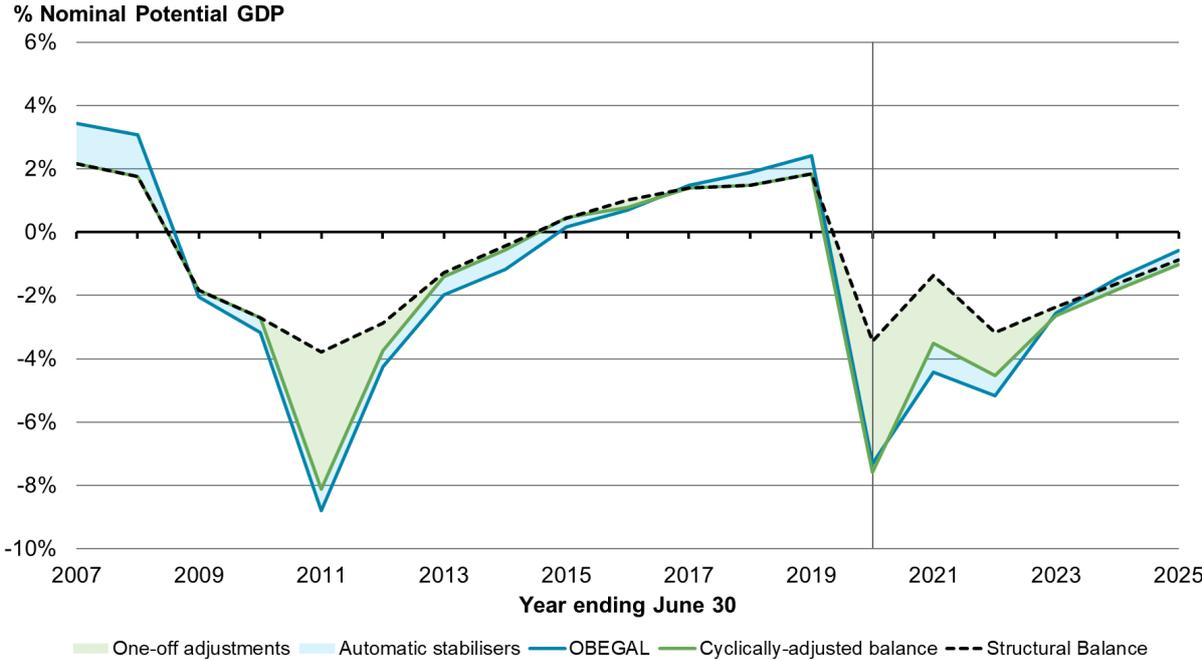
4 We note the limitations of using a nominal potential series given that New Zealand is an inflation targeting economy rather than a price-level targetter. Because New Zealand does not target the price level, the level of nominal potential GDP will change whenever we get an undershoot or overshoot in CPI and other prices (while acknowledging that the relevant set of prices in nominal GDP is wider than CPI inflation ie, includes capital goods, exports). In the case of an undershoot, we only required that the growth in prices returns to target. However, the level of prices, and therefore the level of nominal potential GDP, will be lower.

Subject to judgement, revenue or expenses will be excluded from the structural balance if they:

- i. have a significant impact on OBEGAL (a total impact of 0.5% of the current year’s GDP or more across all affected years);
- ii. are individually identifiable in the government’s financial statements; and
- iii. are one-off items, or are due to changes in accounting treatment and therefore have no underlying cashflow impact.

The structural balance shown in Figure 2 reflects these criteria using data from BEFU 2021. Compared to the HYEUFU 2020, the initial forecast period shows that less of the forecast OBEGAL deficit can be explained by one-off factors. The difference between the structural balance and the CAB prior to 2019 reflects two key factors: firstly, net Earthquake Commission (EQC) and Southern Response payments from the Christchurch and Kaikōura earthquakes; and secondly, several accounting and valuation changes that have no underlying cashflow impacts.

Figure 2 – OBEGAL, the CAB and structural balance using BEFU 2021 data⁵



Source: The Treasury

5 A previously published version of this chart did not incorporate a downward accounting revision to the one-off adjustment for appropriated COVID-19 operating expenditure for the 2019/20 year. This resulted in an overstatement of the difference between the cyclically-adjusted balance and the structural balance for this year only. Figure 2 above corrects this error.

The fiscal impulse

The fiscal impulse (FI) aims to provide an estimate of how the stance of fiscal policy has changed and whether more or less support is being provided to the economy, relative to the previous year. The Treasury's FI measure was first presented in Philip and Janssen (2002) and is published in each Economic and Fiscal Update (EFU).

The FI is a simple indicator. It measures the change in magnitude of fiscal support from one year to the next. It does not estimate the economic impact of that support. This will vary depending on factors including economic conditions and the composition and effectiveness of spending. The fiscal impulse should be considered alongside the overall level of fiscal spending for a more complete view of the magnitude of fiscal support.⁶

The old fiscal impulse (FI), as presented at BEFU 2021, focuses on the change in the amount of discretionary fiscal policy support relative to the previous year. Discretionary fiscal support encompasses changes to government spending or taxes through Government decisions, including support to individuals and firms as part of policy packages.

Methodology changes to the fiscal impulse

The Treasury intends to replace the old FI indicator described above with a new total fiscal impulse (TFI) measure. While the old FI estimates the first-round contribution of discretionary fiscal policy, it is commonly misinterpreted as the total contribution of government support to aggregate demand. This issue is addressed by the first difference between the FI and TFI explained below. Further differences between the FI and TFI reflect international practices and consistency with the updated CAB measure.

The differences between the two measures include:

1. The inclusion of automatic stabilisers in the TFI to illustrate the total impact of government support on aggregate demand.
2. The calculation of the TFI as the change in the fiscal balance⁷, and the resulting inclusion of net finance costs.
3. The use of potential nominal GDP as the denominator (the old FI uses nominal GDP).
4. The TFI is decomposed into its policy components (the old FI is not).
5. The TFI is decomposed into its financial components (the old FI is not).

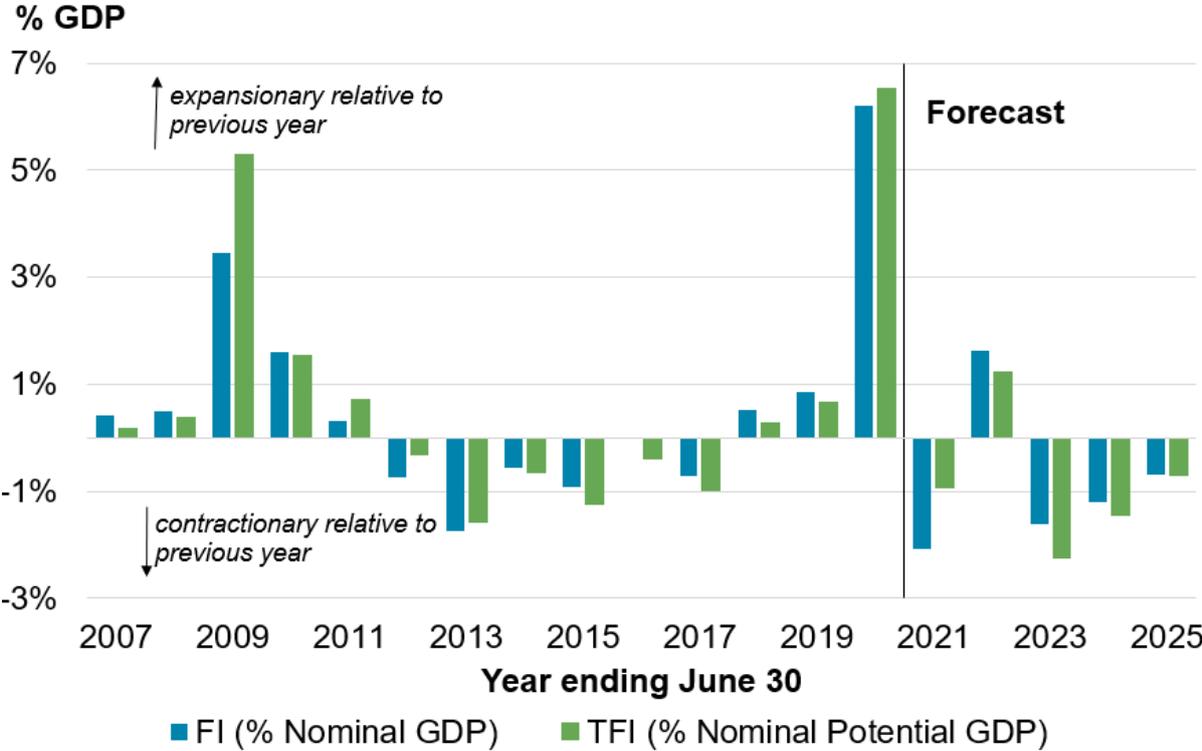
These changes are explained in further detail below, and the differences between the old FI and new TFI are illustrated in Figure 3.

6 There is considerable uncertainty around estimates of the fiscal impulse in the current environment. This reflects unprecedented swings in the output gap and other forecast variables.

7 The fiscal balance is residual cash adjusted for some expenditure items that do not directly affect domestic demand. For comparison, the FI is calculated as the change in the cyclically-adjusted primary balance adjusted for the position in the economic cycle and some expenditure items that do not directly affect domestic demand.

The FI and TFI both measure core Crown and Crown entity flows. They are both cash measures (ie, calculated using line items from the cash flow statement instead of the operating statement), which differs from OBEGAL, the CAB, and the structural balance as (accrual measures).

Figure 3 – The FI and TFI using BEFU 2021 data



Source: The Treasury

1. Including automatic stabilisers in the TFI

The main difference between the old FI and the new TFI is that the latter includes the impact of the automatic stabilisers due to the economy’s position in the economic cycle. These automatic stabilisers have historically contributed sizeable amounts to supporting the economy, especially during the global financial crisis in 2009.

The old FI illustrates the first-round contribution of Government spending and revenue decisions to aggregate demand. However, it does not capture the total contribution of government support, including automatic stabilisers and net finance costs. By including the automatic stabilisers, the TFI illustrates the government’s first-round impact on the economy resulting from the full change in the fiscal balance. In a downturn, the fiscal balance will automatically decline in response to the economic cycle, as a substantial portion of fiscal stimulus is provided by automatic stabilisers. In this case, the TFI aims to provide clarity about the breakdown of support provided automatically and through discretionary policy packages.

2. The calculation of the TFI as the change in the fiscal balance and the resulting inclusion of net finance costs

The Treasury's old top-down approach to estimating discretionary fiscal policy involves stripping out cyclical revenues and expenses, and treating any change in structural revenues and expenses as discretionary. This approach uses the primary balance (i.e. excluding net finance costs), while the new TFI uses the fiscal balance and therefore includes net finance costs.

The old FI is calculated as the year-on-year change in the cyclically-adjusted primary balance (CAPB) from changes in government spending and revenue. The CAPB is the government's cash balance adjusted for the position of the economy and some expenditure items that do not directly affect domestic demand. This method of estimating the old FI is consistent with the OECD and IMF's top-down approach (Schinasi and Lutz, 1991).⁸

The new TFI is calculated as the year-on-year change in the fiscal balance. The fiscal balance is residual cash adjusted for some expenditure items that do not directly affect domestic demand.

3. Presenting the fiscal impulse as a share of nominal potential GDP

The old FI uses nominal GDP as the denominator, while the new TFI uses potential nominal GDP.

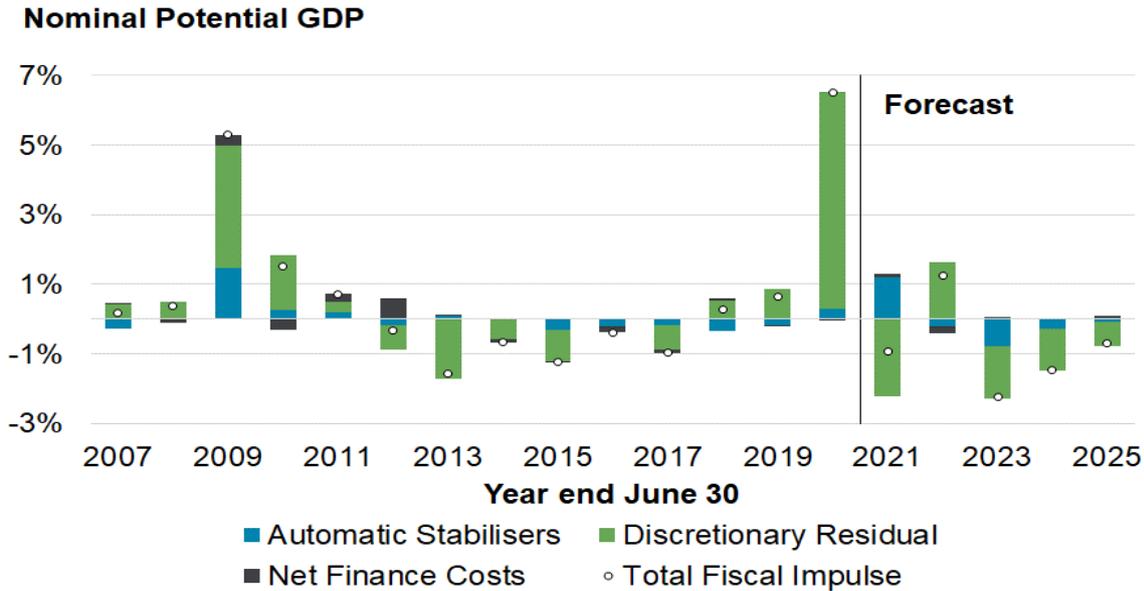
For the same reasons as with the CAB and structural balance, the use of nominal potential GDP is more consistent with international practice. By presenting the fiscal impulse as a share of potential nominal GDP, any changes in expenditures will only be interpreted as discretionary or contractionary if the growth in expenditures deviate from the potential growth rate.

4. Policy decomposition of the TFI

The TFI can be decomposed by policy type into cyclical adjustments (automatic stabilisers), net finance costs, and the remaining 'discretionary residual' component, as shown in Figure 4. The 'discretionary residual' component captures largely the same information as the old FI - both discretionary fiscal policy decisions and any revenue or expenditure items not explained by either cyclical or finance cost estimates.

8 The Treasury's old FI uses nominal GDP expressed as a percentage of nominal GDP, while the OECD and IMF use trend or potential GDP.

Figure 4 – Policy decomposition of the TFI using BEFU 2021 data



Source: The Treasury

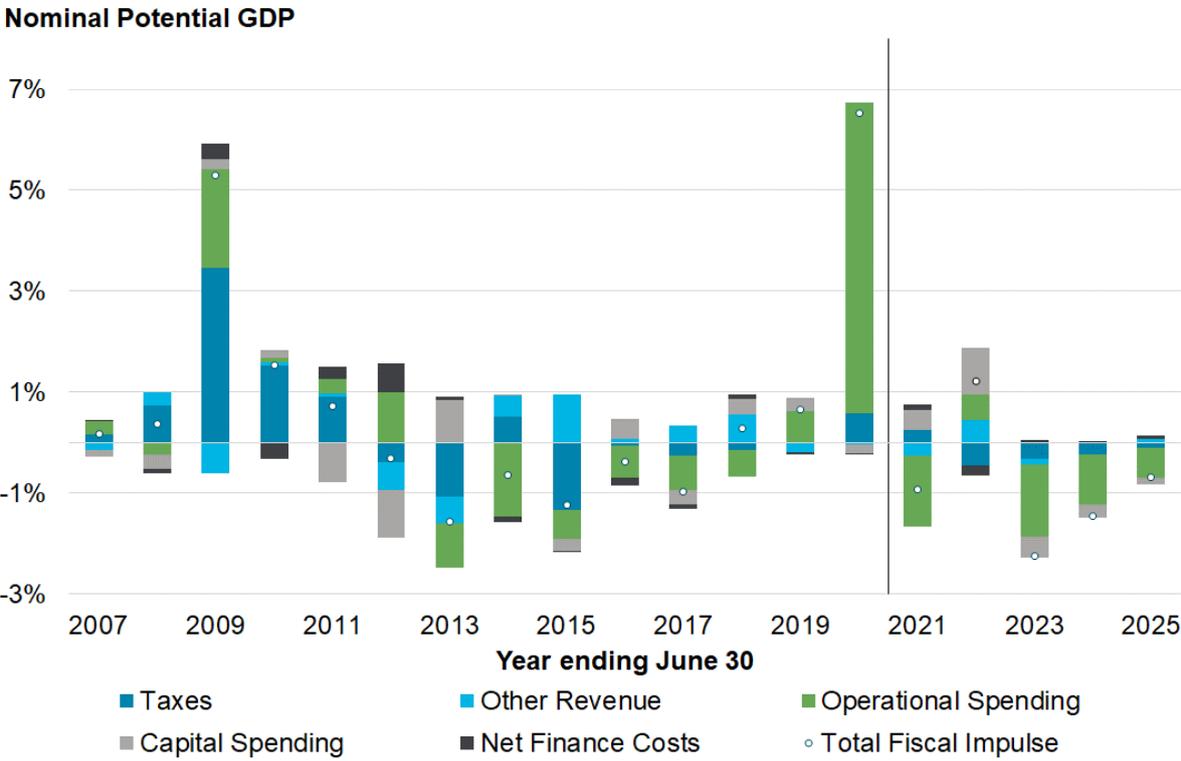
While separating out the discretionary fiscal policy component on its own would provide a more granular picture of the fiscal stance, the availability of accurate ongoing discretionary welfare data is limiting for both the old FI and TFI. We are able to estimate the point-in-time impact of a new discretionary fiscal policy at the EFU after the policy is announced. However, factors such as delayed spending on discretionary policies by departments mean we are unable to accurately calculate the actual marginal impact of these policies and provide a useful comparison over time.

5. Financial decomposition of the TFI

The TFI can also be decomposed into taxes, other revenues⁹, operating expenditure, capital expenditure, and net interest payments, as seen in Figure 5. This financial decomposition allows the structure of fiscal policy to be studied at a high level when used alongside the policy decomposition. As an example, this decomposition could provide an understanding of the structure of fiscal consolidation.

9 Other revenue in the TFI is made up of other sovereign receipts (eg, ACC, EQC, and FENZ levies), sales of goods and services, rental receipts, grants, donations, and other miscellaneous receipts.

Figure 5 – Financial decomposition of the TFI using BEFU 2021 data



Source: The Treasury

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