Enhancing the role of fiscal policy in New Zealand's macroeconomic stabilisation

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This is a draft working paper. It is a work in progress and feedback is welcome.

Abstract

This paper considers the role of fiscal policy in New Zealand's macroeconomic stabilisation.

Over the last thirty years, monetary policy has been primarily responsible for cyclical stabilisation, while fiscal policy has been responsible for debt sustainability. Fiscal policy has supported macroeconomic stability in the background through the automatic stabilisers and broadly counter-cyclical discretionary stance.

There is a need to re-assess the role of fiscal policy in light of structural challenges, especially the low interest rate environment. Fiscal policy will likely need to play a significant role in macroeconomic stabilisation in the future if monetary policy is constrained by the effective lower bound on interest rates. This paper examines the high-level options, including strengthening the automatic stabilisers, counter-cyclical discretionary policies or developing 'semi-automatic' stabilisers. There is a need to consider fiscal institutions and administrative capacity to implement stabilisation policy effectively and maintain debt sustainability.

JEL classification: E61, E62

Introduction

This paper considers the role of fiscal policy in New Zealand's macroeconomic stabilisation. It provides an overview of the issues with the goal of promoting further debate on this topic. It is part of a broader work programme considering New Zealand's macroeconomic frameworks. The work programme is considering how approaches to macroeconomic policy may need to adapt in the wake of COVID-19 and structural trends in the economy.

The paper begins with the motivation, section two discusses the contribution of fiscal policy to macroeconomic stabilisation, section three discusses fiscal frameworks, section four discusses the automatic stabilisers and section five discusses discretionary policy and semi-automatic stabilisers.

Fiscal policy refers to the government's management of the public finances, which includes revenues, expenses, budget balance, assets and liabilities. It is useful to consider the roles of fiscal policy along three dimensions: sustainability, structure and stabilisation (Barker, Buckle and St Clair, 2008):

- Fiscal sustainability refers to the requirement for the government to meets its inter-temporal budget constraint. Operational definitions of fiscal sustainability focus on the probability that governments can service their current and future debt obligations under realistic conditions (Buckle and Cruickhank, 2013; Debrun, Ostry, Willems and Wyplosz, 2019; IMF, 2021).
- Fiscal structure refers to the size and composition of taxes and expenditure. Key considerations are efficiency and equity. Fiscal structure can affect living standards through a range of channels (Kneller, Bleaney and Gemmell, 1999; Fournier and Johansson, 2016; Akgun, Cournède and Fournier, 2017).
- The stabilisation role refers to price stability and reduction of macroeconomic fluctuations, such as excess volatility in output and employment (Allsopp and Vines, 2005).

These roles are inter-dependent and cannot be fully separated in analysis. The entire framework should be designed and evaluated with respect to the ultimate outcome of improving society's wellbeing. In particular, fiscal and monetary frameworks need be considered together. This is because the government's balance sheet and inter-temporal budget constraint consolidate both fiscal and monetary operations (Sargent and Wallace, 1981; Leeper, 1991; Sims, 1994; Woodford, 2001).

The question of the appropriate role of fiscal policy in macroeconomic stabilisation is not new. In New Zealand, as elsewhere, activist fiscal policy was operated after the second world war, influenced by Keynesian economics. In the 1970s and early 1980s, fiscal policy was challenged by external shocks and high inflation. Policy reforms in the 1980s and 1990s followed. This led to an institutional framework in which monetary policy has the primary macroeconomic stabilisation role. Fiscal policy was re-oriented around medium-term goals with a focus on debt sustainability and microeconomic efficiency (White, 2013).

Thus the macroeconomic institutions arising out of the 1980s and 1990s have been designed around the principle that monetary policy should be responsible for inflation control and cyclical stabilisation, while fiscal policy should be responsible for debt sustainability. This idea became popular amongst academic macroeconomists and policy makers. It became known as the 'consensus assignment' (Kirsanova, Leith and Wren-Lewis, 2009). This assignment drew support from distinct strands of thought.

The consensus assignment found support in New Keynesian macroeconomic theory, which used sticky-price models with social welfare derived from consumers' utility (Kirsanova, Leith and Wren-Lewis, 2009). In this class of models (eg, Woodford, 2003), it is generally optimal for the nominal interest rate to be varied by the central bank in response to aggregate demand shocks to ensure the 'right' real interest rate, since prices adjust slowly. Fiscal policy is a less efficient tool since it would entail temporary movements in the size and structure of government away from its socially optimal level. There are two caveats to this analysis. One is that monetary policy is assumed to be unconstrained by, for example, the effective lower bound or fixed exchange rate regime. The other caveat is that fiscal policy may be more effective in offsetting particular distortions or shocks.

Institutional and political economy arguments also supported the consensus assignment. It was argued that monetary policy could be adjusted more quickly and frequently than fiscal policy. A central bank with operational independence could be insulated from political processes and overcome a problem of time consistency. Conversely, discretionary fiscal policy was subject to implementation lags and political processes that made it unsuitable for cyclical management. Proponents of this view recognised that automatic fiscal stabilisers may be helpful, or at least not harmful, in supporting macroeconomic stability (Taylor, 2000).

New Zealand's public sector management reforms in the 1980s emphasised agency costs and the need for public sector accountability (Reddell, 1999). A strict inflation target was established as a contract between the Minister of Finance and central bank governor. Transparency and accountability mechanisms were focussed on achieving credibility for a significant disinflation.

New Zealand's inflation targeting regime has evolved to provide for greater flexibility to stabilise the real economy (McDermott and Williams, 2018). It has broadened its formal objectives to include both inflation and the real economy (currently formulated in terms of a dual mandate). The time horizon for inflation control is medium term. This evolution to flexible inflation targeting was in step with both macroeconomic research and international central banking practice (Svensson, 2010).

There have always been limits to the argument that only monetary policy should be tasked with stabilisation. Some degree of fiscal and monetary coordination is necessary because fiscal policy influences aggregate demand and therefore inflation pressures (RBNZ, 2001). And public debt sustainability provides backing for the achievement of price stability.

There has been frequent consideration of the respective stabilisation roles of fiscal and monetary policy in New Zealand.[2] Through the 1990s and 2000s, there was considerable attention on external imbalances and the impact of high interest and exchange rates for economic performance. Proposed solutions included strengthening fiscal balances (Lane, 2013), reducing fiscal pro-cyclicality (Brook, 2013) and designating certain fiscal instruments for cyclical stabilisation (Ball, 1996; Buiter, 2006; Schmitt-Hebbel, 2006). More recently, attention has turned to the coordination issues in an environment of subdued inflation, low interest rates and alternative monetary tools.

New Zealand's fiscal framework is based around transparency and principles of fiscal responsibility (Buckle, 2018). Legislative change in 2013 recognised that fiscal policy should put some weight on macroeconomic stabilisation. A principle was added to the Public Finance Act that required the government to have regard to the interaction between fiscal

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[2] This theme is reflected in successive macroeconomic forums organised by the Reserve Bank and the Treasury, see Buckle and Drew (2006), Smith (2011) and McDermott (2013).

policy and monetary policy in setting its fiscal strategy.[3] This formulation retained the notion that monetary policy had the primary responsibility for stabilisation. But it made clear that policymakers should consider the implications of the fiscal stance for macroeconomic stability and the fiscal-monetary mix.

By early 2020, New Zealand's macroeconomic framework had evolved to a position whereby fiscal strategy considered macroeconomic stability, but monetary policy remained firmly responsible. This was challenged during the course of the COVID-19 pandemic. As the official cash rate was cut to 0.25 percent, a rapid and large fiscal expansion was implemented.

Internationally, there has been a reappraisal of the role of fiscal policy in the last decade. This re-assessment partly reflects broader macroeconomic developments after the Global Financial Crisis (GFC), which have included persistently low inflation and interest rates. Furman and Summers (2020) argue that "active use of fiscal policy is essential in order to maximize employment and maintain financial stability in the current low interest rate world". Blanchard, Felman and Subramanian (2021) refer to a "new fiscal consensus" for advanced economies summarised by three propositions:

> *"First, macro policy measures are needed to increase aggregate demand to match supply, because private sector demand has been chronically weak. Second, fiscal policy needs to be the main macro tool to close the output gap, since monetary policy tools have largely been exhausted. Third, there is room to use fiscal policy in this way, because government debt, even though it is high, appears to be sustainable."*

In combination, the following propositions create a case to put greater weight on the stabilisation role of fiscal policy:

- *The limits of monetary policy.* When the policy interest rate falls to its effective lower bound, monetary policy is constrained.[4] Moreover, the *risk* of hitting the effective lower bound can reduce expected inflation making it more difficult for the central bank to achieve its mandate (Bianchi, Melosi, and Rottner, 2019; Clarida, 2021). Falling neutral interest rates have raised the likely frequency of hitting the lower bound. With monetary policy constrained, fiscal policy is the only plausible alternative instrument for macroeconomic stabilisation (Allsopp and Vines, 2005). New Zealand's official cash rate reached 0.25 percent during 2020 and a decline in long-term interest rates suggest neutral rates have fallen in recent decades (Figure 1).

- *The welfare gains from macroeconomic stabilisation may be large.* Recent theoretical and empirical work has improved our understanding of the links between business cycles and trend output. Macroeconomic shocks can have large, persistent effects, an effect known as hysteresis (Cerra, Fatas and Saxena, 2020). Concern about hysteresis has been prominent after the GFC. The post-GFC recovery was slow with output remaining below the pre-crisis trend in most advanced economies (Ball, 2014), including New Zealand (Figure 2). Incorporating hysteresis effects may materially improve the cost-benefit calculus of counter-cyclical fiscal policy (DeLong and Summers, 2012; Fatas and Summers, 2018; Watson and Tervala, 2021).

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[3] Nothing prevented governments from having regard to macroeconomic stabilisation prior to 2013. Nor did the new principle bind governments to take particular policy actions. Adding the principle ensured governments would consider the trade offs and make their consideration explicit in their fiscal strategy.

[4] There are other situations in which monetary policy may become constrained. These include fixed exchange rate regimes such as currency unions or situations where the monetary transmission mechanism is impaired (as might arise during a banking crisis).

- *Fiscal policy can be effective in macroeconomic stabilisation.* Recent research has reduced the uncertainty about the effects of fiscal policy (Ramey, 2019). Both spending increases and tax cuts can boost output in the short term, especially when monetary policy is constrained. In a low interest rate environment, the fiscal and welfare costs of public debt may be low and there is greater fiscal space (Blanchard, 2019). Moreover, the monetary-fiscal mix is important for the neutral interest rate, which may have important implications for financial stability and distributional outcomes. And fiscal policy can be more timely and effective than monetary policy for addressing particular types of shocks, as illustrated by the COVID-19 pandemic (Woodford, 2020).

There is a further argument for considering the fiscal framework. Governments are likely to implement fiscal responses to negative shocks. This has been the case during the COVID-19 pandemic when the official cash rate was reduced to 0.25 percent. Fiscal policies had to be designed, authorised and implemented with limited time and information. Limited administrative capacity constrained policy choices. Building an improved framework and evidence base could better prepare policymakers for future shocks. This could improve the effectiveness, efficiency and sustainability of fiscal policy.

There are several potential counter arguments that could be made.

It could be argued that monetary constraints are institutional and therefore can be removed. The lower bound exists because physical currency has a zero interest rate. The interest rate lower bound could be removed by making changes to physical currency (Rogoff, 2017; Agarwal and Kimball, 2015). Alternative monetary tools and strategies have been proposed to make the lower bound less binding, such as temporary price level targeting (Svensson, 2001) or a permanently higher inflation target (Blanchard, Dell'Ariccia and Mauro, 2010). Clearly potential reforms to monetary frameworks need to be evaluated. Nevertheless, it is not clear that monetary reforms alone will be sufficient. A comparative assessment of the relative merits of changes to fiscal and monetary frameworks is desirable.

Uncertainty about macroeconomic conditions represents a key challenge for operating discretionary policy. In particular, highly uncertain output gap estimates make it difficult to determine the appropriate fiscal stance (although this is also a challenge for monetary policymakers). However, the effective lower bound creates an asymmetry that helps with making decisions under uncertainty. When monetary policy is constrained, inadequate fiscal stimulus will lead to lower output and employment with consequent welfare costs. However, if the fiscal expansion is excessive, higher interest rates can maintain output at potential (although the economic costs of higher public debt would need to be considered). There is also considerable uncertainty about the effects of fiscal policy on interest rates and the effects of interest rates on financial stability and distributional outcomes.

Given the focus on fiscal stimulus when the economy is weak, there is a need to consider the impact of fiscal stabilisation policies on fiscal sustainability and quality of spending. There are political-economy risks that fiscal expansions in downturns may not be unwound in booms and may lead to lower quality expenditure. These risks need to be weighed up recognising that counter-cyclical fiscal policy may significantly improve welfare. And fiscal stimulus in a weak economy can improve fiscal sustainability (Auerbach and Gorodnichenko, 2017). There is a need for well-designed policies and institutions to guard against such risks.

Figure 1: New Zealand interest rates

Percent

Official cash rate

10-year government bond yield
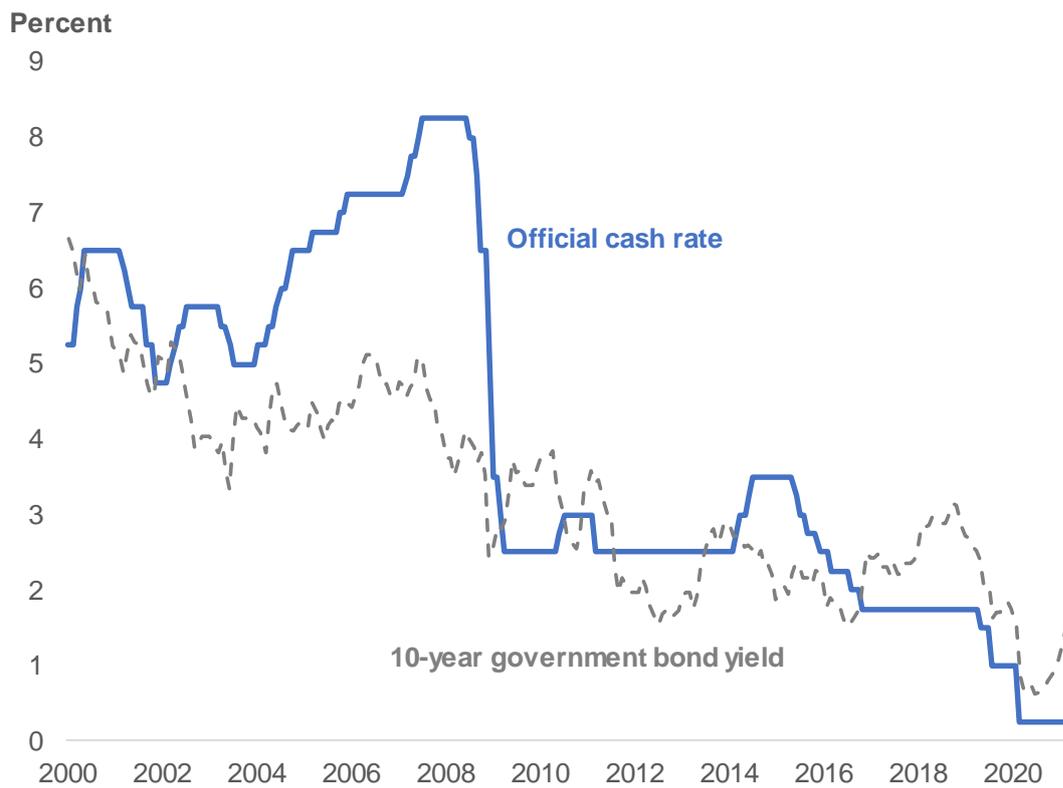
Source: RBNZ

Figure 2: New Zealand's real GDP, 1996 to 2020

Millions of chained
2009/10 dollars

Pre-GFC trend

Real GDP
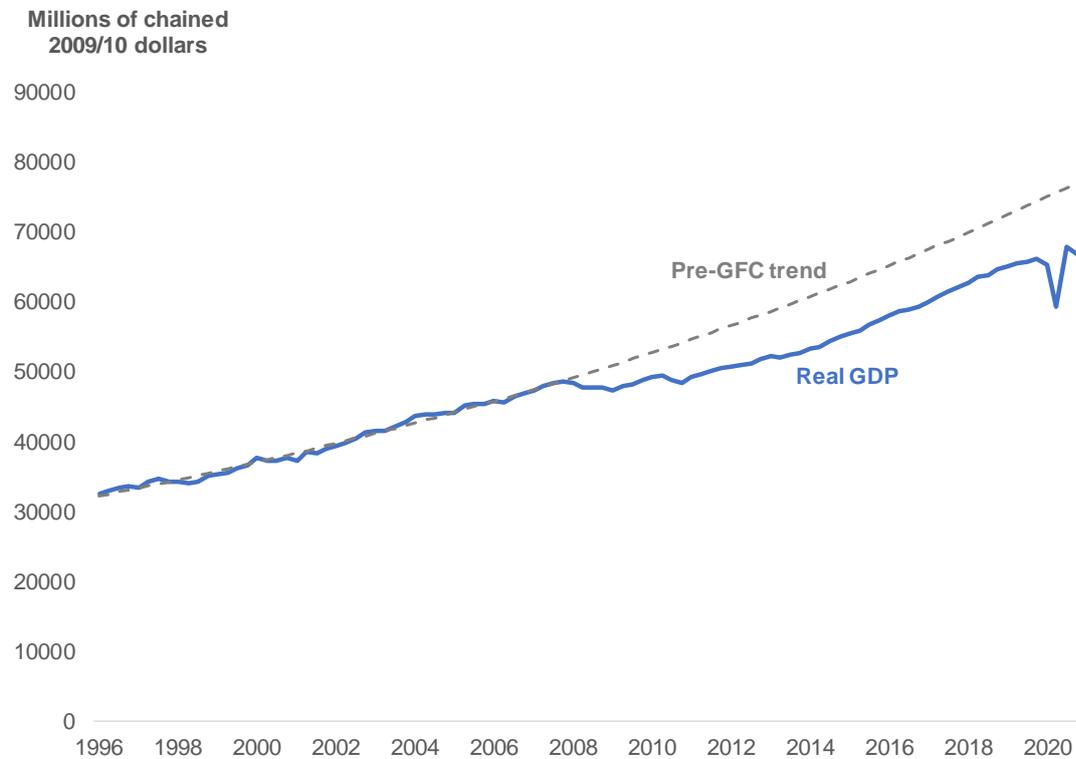
Source: Stats NZ and authors' calculations
Note: Pre-GFC trend is log-linear trend of real expenditure GDP for 1996Q1-2007Q4
extended to 2020Q4.

The contribution of fiscal policy to macroeconomic stabilisation

The macroeconomic effects of fiscal policy

It is first necessary to establish that fiscal policy can contribute to macroeconomic stabilisation. Macroeconomic theories make contrasting predictions about the effects of fiscal policy.

In the textbook Keynesian model, a decrease in the budget balance (via greater government expenditure or tax cuts) would increase aggregate demand for goods and services (and vice versa). This aggregate demand expansion leads to an increase in output and employment. There are several objections to this theory. One is that household expenditure would fall in anticipation of future tax burdens (known as the Ricardian equivalence proposition (Barro, 1974)). A second objection is that higher aggregate demand would lead to a rise in the interest rate (and real exchange rate in an open economy with a flexible exchange rate) that causes crowding out of private activity. A third objection is that increases in government debt may conflict with debt sustainability, leading to either fiscal crisis or an increase in risk premia that reduces economic growth.

The above has led to a body of research on fiscal policy, both theoretical and empirical.

The Ricardian equivalence proposition has limited empirical support. Household saving behaviour is likely to be influenced by public saving levels, but not to the extent of full offset. On theoretical grounds, there are many reasons why the proposition is unlikely to hold, such as finite horizons and credit constraints. Strictly the proposition only holds for the income effects of tax changes and leaves open the possibility that other fiscal instruments can have demand effects (Wren-Lewis, 2000). Moreover, empirical studies find that households behave differently from the predictions of the Ricardian equivalence proposition (Blinder, 2004). Consumers react more strongly to changes in cash income than the theory suggests and less strongly to anticipated future income. Liquidity constraints are thought to be a significant factor driving these results.

The degree of crowding out will depend on economic conditions, including the degree of monetary accommodation. Expansionary fiscal policy would generally be justified in conditions where there is spare capacity. In such conditions, one would expect there to be limited crowding out. These effects can summarised using estimates of the fiscal multiplier. The fiscal multiplier captures the response of real GDP to a change in either government spending or taxes. A fiscal multiplier larger than one implies that real GDP increases by more than one dollar for one dollar of additional government spending. In that case, there is no crowding out. A fiscal multiplier between zero to one, implies that there is less-than-full crowding out. If the government spending multiplier is zero, there is full crowding out.

There has been considerable macroeconomic research on fiscal policy since the Global Financial Crisis. Much empirical research seeks to estimate the (short-run) macroeconomic effects of changes in government spending or taxation. Such estimates take account of the above channels in a dynamic setting, including Ricardian effects, crowding out and other channels. Ramey's (2019) survey found that there is greater precision in estimates of fiscal multipliers. However, there is still uncertainty, as it is a significant challenge to cleanly identify fiscal shocks, since pure experiments are not possible in matters of national fiscal policy. There is no single fiscal multiplier, but rather the effects of fiscal policy depend on policy design, institutional context and economic conditions. Nevertheless, the evidence supports the proposition that fiscal expansion increases output, at least temporarily. Ramey (2019) finds that government purchases multipliers are likely to be between 0.6 and 1 on average and narrative-based time series estimates suggest tax multipliers are even larger in magnitude (between 2 to 3 in absolute value).

New Zealand research also confirms that fiscal policy can have material impacts on output. A number of studies have estimated fiscal multipliers using structural vector autoregression models (Claus, Gill, Lee and McLellan, 2006; Dungey and Fry, 2009; Parkyn and Vehbi, 2014; Hamer-Adams and Wong, 2018). Lyu (2021) builds on this work by extending the sample period, refining data methods and separately estimating the effects of government consumption and investment. Lyu (2021) finds positive output multipliers in New Zealand over 1991 to 2019. The estimated average one-year multipliers are 0.4 for government consumption and 1.4 for government investment. These effects are averages estimated over business cycles. They also are not able to consider the case of the effective lower bound since this has not been binding in New Zealand over the sample period.

An alternative empirical method for identification of fiscal policy effects is to use regression techniques with cross-country panel data. Gemmell, Kneller and Sanz (2011) use such methods to investigate effects of tax changes on GDP growth in the short and long run in OECD economies. Results suggest that tax reductions have positive long-run growth effects and are typically achieved quickly, broadly consistent with results from short-run models.

Dynamic general equilibrium models can also be used to estimate the effects of fiscal policy. IMF (2019) presents fiscal multipliers using the Australia-New Zealand Integrated Monetary and Fiscal Model (ANZIMF). ANZIMF is an annual, multi-region, micro-founded general equilibrium model. It features sticky prices and some consumers that are liquidity constrained. Estimated fiscal multipliers are positive over one- and two-year horizons, with magnitudes differing depending on the type of instrument (in a range of 0.2 to 1.0). When monetary policy is constrained, fiscal multipliers are larger, although only modestly so (multipliers are approximately 15 to 20 percent larger than when monetary policy is unconstrained). Murray (2013) uses simple estimated model of the New Zealand economy which is used to assess the sensitivity of the fiscal multiplier. Simulation analysis suggests that the fiscal multiplier would rise substantially if monetary policy is constrained by the effective lower bound.

Concerns about fiscal solvency will be relevant where governments are near fiscal limits. Expectations will matter and multiple equilibria are possible (Calvo, 1988). However, New Zealand appears some distance from any debt limit, given its relatively low public debt ratio (by international comparison). Parkyn and Vehbi (2014) test whether the size of fiscal multipliers are reduced when fiscal reaction to public debt levels is included. Using data for New Zealand over 1983 to 2010, the magnitude of fiscal multipliers was only slightly reduced when debt feedback was included. This is consistent with the notion that fiscal solvency constraints have not substantially weakened fiscal policy transmission in New Zealand over the sample period.

It is useful to distinguish the automatic and discretionary components of the budget balance. The automatic fiscal stabilisers refer to part of the budget that operates in a counter-cyclical manner without requiring discretionary policy decisions. The automatic fiscal stabilisers refer to structural fiscal policies that mean the budget balance is positively correlated with the economic cycle, all else equal. For example, a progressive tax structure will mean that the tax-to-GDP ratio automatically increases (decreases) when the economy is operating above (below) capacity. The expenditure-to-GDP ratio will decrease (increase) when the economy is operating above (below) capacity. This would occur if real expenditure remained constant (as the GDP denominator would move in a cyclical manner), but may be further accentuated by expenditures that are sensitive to the cycle (such as unemployment-related transfers).

Measures of the size of automatic stabilisers typically focus on the degree to which they stabilise incomes. However, this does not necessarily inform us of their effectiveness in stabilising either output or consumption. It is challenging to econometrically identify the

effects of automatic stabilisers since they are endogenous to the cycle, by definition. The literature estimating fiscal multipliers uses exogenous fiscal shocks to identify the effects of fiscal policy.

The evidence of the effectiveness of the automatic stabilisers comes largely from studies using a cross section of countries. This evidence suggests that the size of government is negatively correlated with output volatility in advanced economies (Gali, 1994; Fatas and Mihov, 2001; Debrun and Kapoor, 2010). Government size is used as an indicator of the size of the automatic stabilisers that is (somewhat) exogenous to the economic cycle. While this correlation does not establish causality, it has been found to be robust to a wide range of controls, data samples and specifications (Debrun and Kapoor, 2010).

A full macroeconomic model would be needed to fully characterise the effectiveness of the automatic stabilisers, such as McKay and Reis (2016). However, such models will necessarily be dependent on the specific shock modelled, assumptions made and definition of effectiveness.

Thus we can conclude that fiscal policy has material macroeconomic effects. There remains uncertainty about the magnitude of its effects. In particular, the effects of different instruments and degree to which effects depend on economic conditions. For example, empirical estimates of tax multipliers identified using narrative methods suggests tax multipliers that are higher than spending multipliers. Dynamic, stochastic, general equilibrium models tend to estimate spending multipliers that are larger than tax multipliers. Further research in this area would be desirable, especially for small, open economies such as New Zealand.

Having established that fiscal policy can have significant macroeconomic effects, it remains an open question whether macroeconomic policy has been stabilising (counter-cyclical), neutral (a-cyclical) or destabilising (pro-cyclical). This will depend on the size, timing and composition of changes in the fiscal balance over the economic cycle.

To assess the cyclicality of fiscal stance, we will estimate the size and timing of fiscal changes. The automatic stabilisers will automatically respond to the cycle by definition, so we will focus on quantifying their size. In the case of discretionary and overall fiscal policy, we will need to assess both the size and timing of changes over the economic cycle.

The size of the automatic stabilisers

We consider two approaches to estimating the size of the automatic stabilisers. The first is a macroeconomic approach that is derived from the method for estimating the cyclically-adjusted budget balance (Price, Dang and Botev, 2015). The second is a microeconomic approach that uses a microsimulation model to estimate the contribution of the tax and transfer system in stabilising household incomes (Maravalle and Rawdanowicz, 2020a). The microeconomic approach enables more detailed analysis of the impact of policies across the distribution of households, but can only capture the direct income effects on households. Macroeconomic approaches complement the microeconomic approaches by measuring aggregate effects.

The macroeconomic approach uses the semi-elasticity of the budget balance with respect to the output gap. Specifically, the semi-elasticity measures the response of the budget balance-to-GDP ratio (in percentage points of GDP) for a one percentage point change in the output gap (in percent of GDP). In other words, it measures the proportion of an economic shock that is offset by changes in the budget balance.

The budget balance semi-elasticity with respect to the output gap is defined in the following relationship:

$$\frac{CAB_t}{Y_t} - \frac{B_t}{Y_t} = -\epsilon_t \cdot GAP_t \qquad (1)$$

where CAB_t/Y_t is the cyclically-adjusted budget balance (in percent of GDP), B_t/Y_t is the actual budget balance (in percent of GDP), ϵ_t is the budget balance semi-elasticity and GAP_t is the output gap (all measured in year t).

The Treasury calculates New Zealand's cyclically-adjusted budget balance using estimated elasticities for specific categories of revenue and expenses (Parkyn, 2010). The Treasury's estimates of the budget balance semi-elasticity are time-varying due to changes in the size and composition of revenue and spending over time.

Price, Dang and Botev (2015) estimate the budget balance semi-elasticity for OECD countries using the OECD's method and data. The estimate for New Zealand is close to those made by the Treasury since the methods and data are similar. New Zealand's budget balance semi-elasticity is estimated to be 0.51 on average over 2002 to 2011 in Price, Dang and Botev (2015) and in the Treasury's cyclically-adjusted balance method (using data from the Treasury's 2020 *Half-Year Economic and Fiscal Update*). This is very close to the average for OECD countries of 0.50 (Figure 3). Using the Treasury's cyclically-adjusted balance method, the semi-elasticity averages 0.48 over 2011-2020.

Figure 3: Effectiveness of automatic stabilisers (budget balance semi-elasticity)
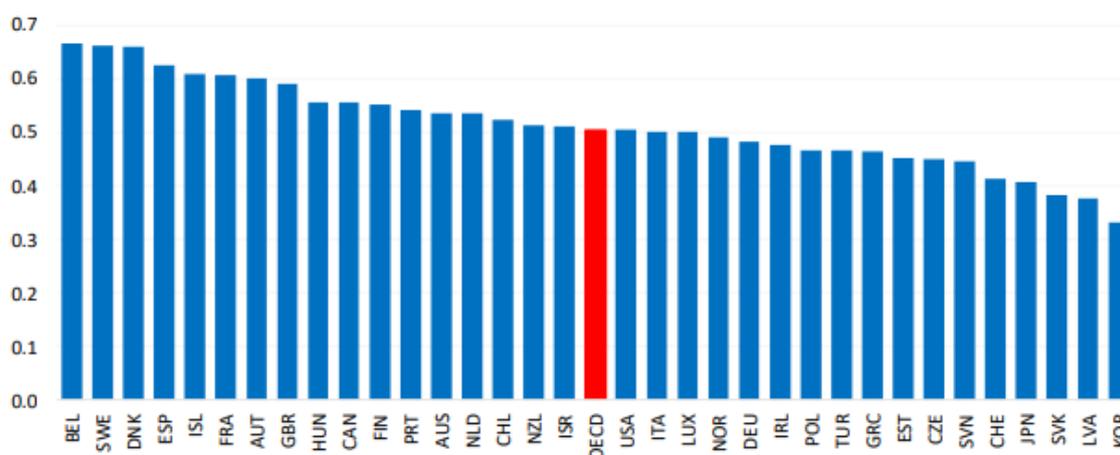
Source: Maravalle and Rawdanowicz (2020a)

A microeconomic perspective on the automatic stabilisers assesses how the tax and transfer system performs in stabilising household disposable incomes. Microsimulation models can be used to estimate the size of the automatic stabilisers at the individual household level (Dolls, Fuest and Peichl, 2012). This approach has the advantage of isolating the causal effects of the automatic stabilisers, which is more difficult with macro-level data. However, the results will depend on the type of shock modelled and how the counter factual is specified.

We follow the approach taken in a number of studies that illustrate the effects of the tax and transfer system in stabilising disposable incomes following a shock to market earnings

(Dolls, Fuest and Peichl, 2012; European Commission, 2017; Maravalle and Rawdanowicz, 2020a).

We shall use the Treasury's microsimulation model of the tax and welfare system, TAWA. The model combines data from Stats NZ's Household Economic Survey and administrative datasets using the Integrated Data Infrastructure (IDI).[5] TAWA models the effect of the New Zealand tax and transfer system on household incomes.

For each household h, the disposable income can be defined as follows:

$$DI_h = MI_h + B_h + TC_h - T_h \qquad (2)$$

where

- DI_h is disposable income.
- MI_h is market income, composed of wages, self-employment income and investment income.
- B_h is welfare benefits received from the government (net of tax). This includes main benefits, NZ Superannuation, the Accommodation Supplement, and the Winter Energy payment with amounts modelled by TAWA.
- TC_h is tax credits received from the government. This consists of Working for Families payments and the Independent Earner Tax Credit.
- T_h is incomes taxes paid. This includes personal income taxation and the ACC levy.

We consider two scenarios that reduce market income, which we denote as ΔMI_h. The income stabilisation coefficient (ISC_h) can then be defined as the relative difference between ΔMI_h and ΔDI_h:

$$ISC_h = 1 - \frac{\Delta DI_h}{\Delta MI_h} \qquad (3)$$

The income stabilisation coefficient measures the share of disposable income which is absorbed following a shock to market income due to the tax and transfer system (European Commission, 2017). It is a microeconomic indicator of the size of the automatic stabilisers.

We can use the relationship between disposable income and market income to rewrite the income stabilisation coefficient in terms of the tax and transfer system:

$$ISC_h = \frac{\Delta T_h - \Delta B_h - \Delta TC_h}{\Delta MI_h} \qquad (4)$$

The two income shock scenarios are chosen to reduce aggregate market income by 5 percent. The respective scenarios consist of a marginal reduction in all market incomes and

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[5] Results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data/. The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

a marginal increase in the number of people unemployed.[6] The average ISC for all households and over the income distribution are shown in Figure 4. We find that the proportionate reduction in market incomes has an average ISC of 33.0% (with a 95 percent confidence interval of ± 0.5%), while an increase in unemployment has an average ISC of 42.4% (with a 95 percent confidence interval of ± 1.0%). The most significant component of the total stabilisation is different in each scenario. In the first scenario, reduced taxes play the largest role, while in the second scenario increased benefit payments are more significant.

Figure 4: Effect of automatic stabilisers in stabilising household incomes
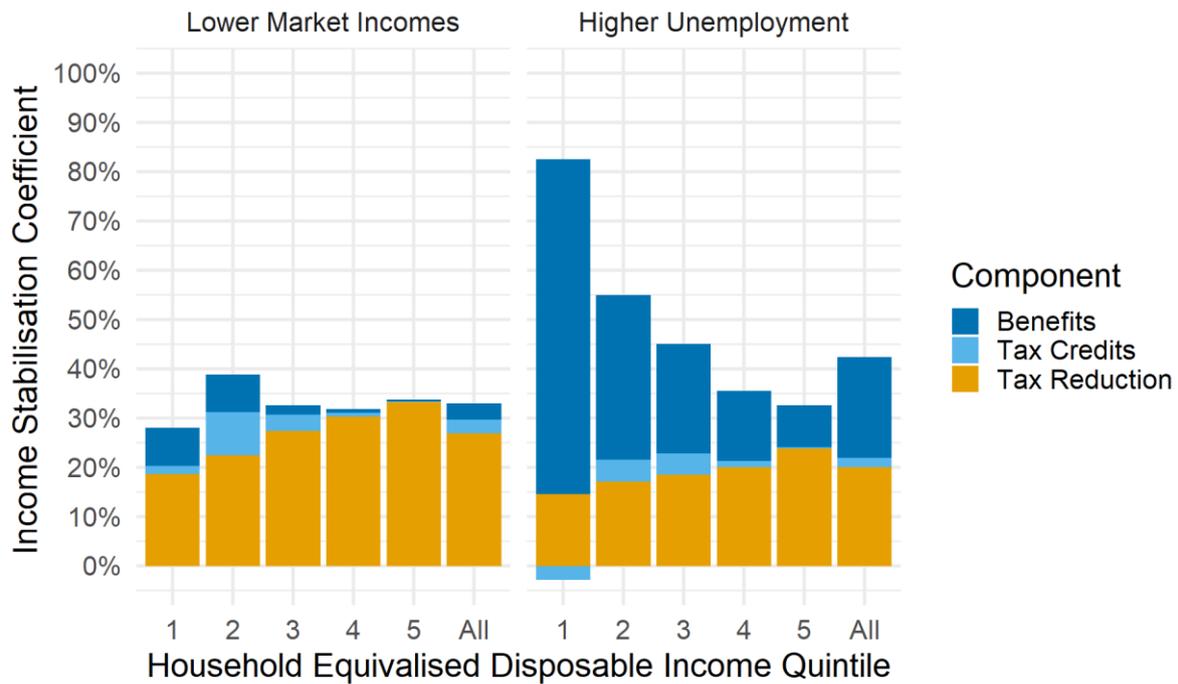
Source: Estimates using the Treasury's TAWA model.
Note: Household income quintiles use household equivalised income using the modified OECD equivalisation scale.

Transfers are relatively more significant for the lower quintiles than higher quintiles, although overall rates of stabilisation are similar across the distribution in the income shock scenario. There are marked differences across income quintiles in the higher unemployment scenario. Working for Families tax credits have a stabilisation effect particularly in the second quintile.

Note that in the first scenario, the ISC is essentially measuring an effective marginal tax rate. In the second scenario, the ISC is essentially measuring participation tax rates. Thus this indicator illustrates how can be a trade-off between stabilisation and long-term efficiency objectives.

There are several caveats to this measure of the automatic stabilisers. First, the illustrative shocks make modelling assumptions that may be different to actual macroeconomic shocks. Second, if the amount received of a certain benefit item does not change following the shock to market income, this benefit does not contribute to the stabilisation of income on this

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[6] Results are sensitive to modelling assumptions. The unemployment scenario is implemented as a reduction in market income of 5 percent by increasing the number of unemployed people at the unit-record level. Job loss is modelled as occurring in a sub-population uniformly at random. The sample is 5 percent of individuals who are earning at least $300 per week. Results were averaged over four different random samples in order to reduce variability due to particular random samples.

measure. Third, the method only considers household disposable incomes and not the full budget balance (including other types of taxes and spending).

As an international comparison, we find that the average ISC of 33.0% (for the earnings shock) is the same value as that found for the average of European Union countries in European Commission (2017), although there is a range across European countries from 20% (Bulgaria) to 45% (Austria).

The cyclicality of fiscal policy

There is a wide literature that studies the cyclical behaviour of discretionary fiscal policy by estimating equations with an estimated fiscal rule (eg, Golinelli and Momigliano, 2009; Fatas and Mihov, 2012; Bénétrix and Lane, 2013). The fiscal rule typically captures how a fiscal variable (such as budget balance) responds to the lagged fiscal variable, debt ratio and a measure of the economic cycle, such as the output gap. The inclusion of a debt variable is consistent with a debt sustainability objective. The inclusion of an economic cycle variable measures the degree to which fiscal policy is pro-cyclical or counter-cyclical.

A common approach to assessing fiscal cyclicality is to estimate equations of the form (Golinelli and Momigliano, 2009):

$$\Delta CAPB_t = \alpha_0 + \alpha_1 \cdot CAPB_{t-1} + \alpha_2 \cdot DEBT_{t-1} + \beta \cdot GAP_{t \, or \, t-1} + u_t \qquad (5)$$

$$\Delta PB_t = \alpha_0 + \alpha_1 \cdot PB_{t-1} + \alpha_2 \cdot DEBT_{t-1} + \beta \cdot GAP_{t \, or \, t-1} + u_t \qquad (6)$$

where $CAPB_t$ is the cyclically-adjusted primary budget balance, PB_t is the primary budget balance, $DEBT_t$ is the public debt level and GAP_t is the output gap, all measured in percent of GDP in year t.

Golinelli and Momigliano (2009) note that the literature can find differences in fiscal cyclicality due to different model specifications, data vintages and sample periods. While some studies use the fiscal balance in levels as the dependent variable, this specification would be essentially equivalent to equations (5) and (6) given the presence of the lagged dependent variable on the right hand side.

There are a range of fiscal data sources available, including the national accounts, Government Finance Statistics and the Crown financial statements. For the fiscal balance, we use the central government net lending indicator from the national accounts. This indicator is chosen because it is conceptually aligned to macroeconomic models of aggregate demand.[7] Net lending is a macroeconomic measure of the fiscal balance equal to revenue less transfers, government purchases and interest expenses. This series is available for 2005 to 2019 (March years) from Stats NZ. The primary balance is calculated by subtracting interest expenses from net lending. Fiscal variables are scaled by nominal GDP.

The GAP_t variable is the Treasury's estimate of the output gap at the 2020 *Half-Year Economic and Fiscal Update*. $DEBT_{t-1}$ is the Treasury's main public debt indictor, net core Crown debt as a percent of GDP.

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[7] The GFS net lending indicator would also be suitable but has a shorter time series than the net lending series in the national accounts. The net lending data in GFS and the national accounts are similar in any case.

The cyclically adjusted-primary balance is used as an indicator of the discretionary stance of fiscal policy. It is estimated as a residual after estimating the automatic stabilisers, as follows:

$$CAPB_t = PB_t - \epsilon_t GAP_t \qquad (7)$$

where ϵ_t is the budget balance semi-elasticity derived from the Treasury's cyclically-adjusted balance indicator.

In our model, we estimate two different specifications with either the contemporaneous or lagged output gap. This is a common approach in the literature as the lagged output gap may better reflect the information available when the annual budget is set. We use *ex post* estimates of the output gap. Output gaps can be subject to large revisions (Orphanides and van Norden, 2002). There is a literature that tests sensitivity of fiscal cyclicality to real-time data vintages. This would be worthwhile for further research.

There is an endogeneity issue in that we are measuring the effect of the cycle on fiscal policy but fiscal policy has effects on the economy. Some researchers use instruments for the economic cycle to address endogeneity, which does not appear to make a large difference to results. Endogeneity may bias downward estimates of fiscal cyclicality.

Table 1 presents results of estimating equations (5) and (6). There are four specifications. These include the different dependent variables (cyclically-adjusted and actual primary balances) and contemporaneous and lagged output gaps. The results for discretionary policy are shown by models 1 and 3 in Table 1. The results for the primary balance, and hence both discretionary and automatic stabilisers, is shown by models 2 and 4 in Table 1.

Table 1: Estimated cyclicality of New Zealand's fiscal balance, 2005 to 2019

Model	(1)	(2)	(3)	(4)
Dependent variable:	$\Delta CAPB$	ΔPB	$\Delta CAPB$	ΔPB
Cycle indicator	Output gap in t		Output gap in t-1	
β	0.90** (0.32)	1.24*** (0.28)	1.62** (0.64)	1.75* (0.95)
α_0	-0.02** (0.008)	-0.03*** (0.007)	-0.05*** (0.02)	-0.06*** (0.02)
α_1	-0.51*** (0.14)	-0.51*** (0.12)	-0.68** (0.27)	-0.56 (0.38)
α_2	0.15*** (0.05)	0.17*** (0.04)	0.31*** (0.09)	0.34*** (0.10)
Obs.	14	14	14	14
R^2	0.60	0.73	0.67	0.62

Note: OLS estimates of coefficients and robust standard errors reported in parentheses. The statistical significance of coefficients is reported as follows: * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

These results suggest that fiscal policy – both discretionary policy and the automatic stabilisers – have been counter-cyclical on average over the sample period. Discretionary fiscal policy has had a larger counter-cyclical effect than the automatic stabilisers on average. For discretionary fiscal policy, the coefficient on the contemporaneous output gap – the β parameter – is 0.90 and statistically significant. This means that a one percentage point increase (decrease) in the output gap is associated with a cyclically-adjusted balance that is 0.90 percentage points of GDP higher (lower), all else equal. For the primary fiscal balance – which includes the effects of both discretionary policy and the automatic stabilisers – the β parameter is 1.24 and significant. The β coefficients in the lagged output gap specifications are larger than in the specifications using the contemporaneous output gaps, although coefficient estimates are less precise.

A further concern might be that fiscal policy is asymmetric over the cycle. For example, there has been concern that fiscal policy is counter-cyclical in downturns and pro-cyclical in upturns, which could lead to deficit bias (Brook, 2013). We test this hypothesis by separately estimating the responses to positive and negative output gaps. The equations are in the form below:

$$
\begin{aligned}
\Delta CAPB_t = \alpha_0 + \alpha_1 \cdot CAPB_{t-1} + \alpha_2 \cdot DEBT_{t-1} \\
+\beta_0 \cdot GAP_t \cdot (GAP_t > 0) + \beta_1 \cdot GAP_t \cdot (GAP_t < 0) + u_t
\end{aligned}
\tag{8}
$$

$$
\begin{aligned}
\Delta PB_t = \alpha_0 + \alpha_1 \cdot PB_{t-1} + \alpha_2 \cdot DEBT_{t-1} \\
+\beta_0 \cdot GAP_t \cdot (GAP_t > 0) + \beta_1 \cdot GAP_t \cdot (GAP_t < 0) + u_t
\end{aligned}
\tag{9}
$$

Our results suggests that fiscal policy has operated counter-cyclically across the business cycle in a broadly symmetric way. The hypothesis was investigated by estimating the average responses to positive output gaps (represented by the coefficient β_0) and negative output gaps (β_1) and whether they are significantly different. We find that both β_0 and β_1 are estimated to be positive. Equality of the two coefficients could not be rejected (using a Wald test). The coefficient on negative output gaps was not significant, whereas the coefficient on positive output gaps was significant.

Cyclical adjustment of fiscal balances is a fraught exercise. Romer and Romer (2010) present evidence that changes in cyclically-adjusted tax revenues do not correspond well to changes in discretionary tax policy identified from the narrative record. Romer and Romer (2010) therefore prefer to identify tax shocks using the narrative record.

In order to confirm whether discretionary fiscal policy has indeed behaved counter-cyclically, we use an alternative indicator of discretionary fiscal policy. The following regression equation is estimated:

$$
DTP_t = \alpha_0 + \alpha_1 \cdot DTP_{t-1} + \alpha_2 \cdot DEBT_{t-1} + \beta \cdot GAP_{t \ or \ t-1} + u_t
\tag{10}
$$

where DTP_t is an indicator of discretionary tax policy from the narrative record. The data is compiled for June (fiscal) years. The indicator DTP_t is compiled from the Treasury's forecasts of the revenue impact of policy measures announced at each *Budget Update*, *Half-Year Update* or *Pre-election Update*. The indicator is expressed as a percentage of GDP. For example, $DTP_t = 0.01$ would indicate that announced tax policy changes increased forecast tax revenues in year t by 1% of GDP.

We test the cyclicality of discretionary tax policy changes. If $\beta > 0$, discretionary tax policy is counter-cyclical over this period. If $\beta < 0$, discretionary tax policy has been pro-cyclical over the same sample period. Results are presented in Table 2. In our baseline estimate, $\beta =$

0.40 and is statistically significant. This is broadly consistent with the evidence presented above that discretionary fiscal policy has been counter-cyclical on average.

It would also be useful to test sensitivity of results to other data sources and definitions, which we leave for future work. Crown financial data is used in the government's budgeting and thus may be more deliberately targeted by fiscal policy. However, the Crown financial statements do not present a net lending indicator. Philip and Janssen (2002) develop a proxy indicator for $\Delta CAPB_t$ known as the fiscal impulse indicator, which could be used in this type of analysis.

Table 2: Estimating the cyclicality of discretionary tax policy changes

Model	(1)	(2)
Dependent variable:	DTP	DTP
Cycle indicator	Output gap in t	Output gap in t-1
β	0.40*** (0.003)	0.66*** (0.18)
α_0	-0.02*** (0.11)	-0.03*** (0.007)
α_1	0.41** (0.15)	0.28** (0.16)
α_2	0.09*** (0.02)	0.16*** (0.03)
Obs.	15	15
R^2	0.75	0.82

Note: OLS estimates of coefficients and robust standard errors reported in parentheses. The statistical significance of coefficients is reported as follows: * significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Enhancing the role of fiscal policy in macroeconomic stabilisation

We have established that New Zealand's fiscal policy has operated in a broadly counter-cyclical manner in the last two decades. Part of the reason for this is the automatic stabilisers, which are around the average size in the OECD. Discretionary policy has also operated in a counter-cyclical manner.

The evidence from other OECD countries suggests that fiscal policy generally operates in a broadly counter-cyclical manner (Fatás and Mihov, 2012). The experience during the COVID-19 pandemic further demonstrates the ability of fiscal policy to respond in a counter-cyclical manner. However, the particular features of the pandemic – in particular, the temporary supply reductions associated with suppressing virus transmission – mean it is difficult to compare the COVID-19 shock with other recessions.

A key question is whether fiscal policy could and should be more effective at macroeconomic stabilisation. In particular, whether the existence of the effective lower bound requires a fundamental reconsideration of fiscal reaction functions as argued by Blanchard and Summers (2020). This could include considering whether the fiscal reaction function should

become state contingent by responding more aggressively to the output gap in effective lower bound episodes than otherwise. But in considering fiscal policy as a stabilisation tool, there is a need to consider broader welfare, efficiency and distributional impacts and potential constraints related to administrative capacity and fiscal sustainability.

Common criteria for counter-cyclical fiscal policy is that it is timely, temporary and targeted (Elmendorf and Furman, 2008). One approach is to consider the particular policy options that could meet this criteria. This would include options to strengthen the automatic stabilisers and/or discretionary counter-cyclical policy.

There are options discussed in the literature that combine elements of both automatic stabilisation and discretionary policy. These are fiscal policies that are activated by certain macroeconomic conditions (such as a recession). These instruments are sometimes referred to as 'semi-automatic stabilisers' (Blanchard and Summers, 2020) or 'state-contingent non-discretionary fiscal policies' (Dong, Dunbar, Friedrich, Matveev, Priftis and Shao, 2021). These make sense in the context of a need for a fiscal reaction function that is state contingent, given the asymmetry created by the effective lower bound on interest rates.

The institutional framework needs to be considered. This is because fiscal policy playing the dominant role in cyclical stabilisation would imply a regime shift. Allsopp and Vines (2015) argue that "a macroeconomic policy regime will work well if, and only if it is clear which policy-maker is assigned which objective, the objectives are achievable and the private sector believes that the objectives will be achieved."

The types of issues that could be considered as part of a macroeconomic stability framework would naturally include:
- Objectives;
- Operational targets;
- Instruments;
- Decision making rights, rules and discretion;
- Coordination with monetary policy;
- Information and advice; and
- Transparency and accountability.

The literature on both monetary and fiscal frameworks offers insights into the design of a framework. Monetary frameworks offer lessons for designing a framework explicitly focused on macroeconomic stability. In many advanced economies, the institutional arrangements for monetary policy are typically centred around explicit targets with delegation for decision making to independent central banks (usually a committee of experts). In this sense, there is constrained discretion.

Fiscal policy has generally been the domain of political decision-making, given the broad range of objectives and distributional impacts. Some argue for ways to reduce discretion over certain parts of the budget while maintaining democratic responsibility for overall fiscal policy. One approach is to use legislated automatic stabilisers or develop semi-automatic stabilisers where particular policy changes (eg, in the welfare system) are triggered by certain macroeconomic conditions. Going further, Solow (2005) and Buiter (2006) propose delegation of a narrow set of discretional fiscal instruments to an expert body with a stabilisation remit.

Fiscal frameworks generally have certain legislated rules that govern the broad parameters of fiscal policy. Fall, Bloch, Fournier and Hoeller (2015) argue that fiscal rules should have two objectives: anchor fiscal policy expectations by targeting a prudent debt level and

allowing for macroeconomic stabilisation. There is a trade-off between these two objectives since fiscal expansion in recessions increases uncertainties surrounding the debt path.

Kopits and Symansky (1998) argue that the strongest case for fiscal rules is rooted in political economy. Fiscal rules can overcome a problem of time inconsistency by preventing deficit bias. Fiscal rules act as a commitment device that help governments to achieve a sustainable long-term fiscal position. However, there is a choice between designing rules that approximate optimal fiscal policy and rules that are designed to counter-act deficit bias. Portes and Wren-Lewis (2015) warn that designing fiscal rules based entirely around the imperative of eliminating deficit bias is that such rules may lead to severely sub-optimal outcomes. This illustrates the more general trade offs inherent in commitment versus discretion.

Portes and Wren-Lewis (2015) argue that rules that are effective at reducing deficit bias, yet do not stray too far from optimality, are clearly desirable if they can be found. Second, the choice of fiscal rule may legitimately vary between countries (or over time), if there are known differences in fiscal behaviour or other institutional checks on deficit bias exist. For example, if the fiscal forecasts are made by an independent, credible body.

In practice, fiscal rules have tended to be designed to support debt sustainability while also seeking to avoid pro-cyclicality. Internationally, legislated numerical fiscal rules have often become complex involving the use of cyclically-adjusted indicators and/or escape clauses. Complex, and often over-determined rules, have been associated with low rates of compliance (Eyraud, Debrun, Hodge, Lledo and Pattillo, 2018).

In response to the complexity and weak compliance with numerical fiscal rules, one approach is to design new rules that seek to strike a better balance between simplicity, flexibility and enforceability (Eyraud, *et al.*, 2018). An alternative view is presented by Blanchard, Leandro and Zettelmeyer (2021) in the context of debate about the European Union's fiscal framework. They propose the abandonment of numerical fiscal rules in favour of 'fiscal standards'. They define standards as qualitative prescriptions that leave room for judgment together with a process to decide whether the standards are met. Numerical rules cannot effectively guide policy for all contingencies, especially in the presence of uncertainties around the future path of macroeconomic variables (interest and growth rates) and the effective lower bound. New Zealand's principles of responsible fiscal management are an example of fiscal standards.

New Zealand's fiscal framework has endured over nearly three decades. The main features of the fiscal framework are its emphasis on principles of fiscal responsibility, transparency, and independence in reporting, standards and audit. The Public Finance Act requires New Zealand governments to set their own long-term fiscal objectives to be consistent with principles of responsible fiscal management. The principles include maintaining debt at 'prudent' levels and balancing revenue and expenses over time.

New Zealand's fiscal forecasts are independently produced by the Treasury. There is no evidence that fiscal forecasts have an optimism bias (Frankel, 2011). Nor is there evidence of a deficit bias: since 1994, the operating balance (before gains and losses) has been in surplus in 70 percent of the fiscal years.

It is important to recognise that debt sustainability and fiscal space (distance from a debt limit) are necessary conditions for implementing counter-cyclical fiscal policy. However, the requirements for fiscal sustainability and fiscal space are time varying and uncertain. There is a need to consider uncertainty, which motivates the concept of 'prudent' debt involving a buffer or safety margin, which involves judgments and risk tolerance.

In a stylised sense, current fiscal policy can be approximated by a budget balance rule that puts weight on both public debt stabilisation and output/employment stability (consistent with the empirical estimates of fiscal reaction functions estimated in the previous section). It would be useful to consider alternative reaction functions as a way to conceptualise how fiscal policy could be operated in the future. One approach would be to put greater weight on the output gap, implying a more cyclical budget balance (which could be achieved, for example, by strengthening the automatic stabilisers). But as we have seen above, the importance of counter-cyclical fiscal policy is likely to be state contingent. Thus, it may be more appropriate to consider reactions functions that trigger expansion in a downturn or when monetary policy is constrained (or both). Thus there may be merit in consideration of a recession indicator, such as the Sahm rule or an explicit consideration of the short-term interest rate in the fiscal rule. Sahm's proposal for the United States is that fiscal transfers to households would be triggered when the three-month average national unemployment rate rises by at least 0.50 percentage points relative to its low in the previous 12 months (Sahm, 2019).

In summary, further research would be desirable on both fiscal reaction functions and supporting institutional frameworks. This would consider the issues highlighted above, including decision making, delegation and coordination with monetary policy. It will be critical to consider how alternative frameworks would operate in the upturn of an economic cycle to ensure the maintenance of fiscal sustainability (and broader considerations such as inter-generational equity).

Options for strengthening the automatic stabilisers

Framework for assessment

Assessing the effectiveness of automatic fiscal stabilisers requires consideration of their ability to support macroeconomic stabilisation. Above, we discussed a range of ways to measure the effectiveness of automatic stabilisers. Now, we consider policy options to increase this effectiveness. These policy options present trade-offs with other objectives. As such, a full welfare analysis would require consideration of long-term efficiency and equity effects. Further work is needed on a framework that integrates both long-term efficiency, equity and stabilisation objectives. McKay and Reis (2021) attempt to develop a tractable analytical method that may lead to useful insights about the optimal design of automatic stabilisers.

Standard criteria for considering the effectiveness of counter-cyclical fiscal policy is that it is timely, temporary and targeted (Elmendorf and Furman, 2008). Automatic stabilisers are by their nature timely and temporary. Their automatic nature means they do not share the problems of inside and outside lags with discretionary policy. The operation of automatic stabilisers can support debt sustainability to the extent that they operate symmetrically over the economic cycle.

There are a range of channels that may be important to stabilise output. McKay and Reis (2016) decompose the theoretical channels of automatic stabilisation in the context of a structural macroeconomic model with nominal rigidities and incomplete markets. The four main channels are disposable income, marginal incentives, redistribution and social insurance.

We shall provide quantitative estimates of the effectiveness of the automatic stabilisers using the OECD's macroeconomic method (Price, Dang and Botev, 2015). This uses the budget balance semi-elasticity to measure the size of the automatic stabilisers. In this framework, automatic stabilisers can be strengthened in two ways: by increasing the sensitivity of

revenue or expenditure to the economic cycle, or by increasing their size. This provides a quantitative indication of the materiality of potential policy changes to strengthen the automatic stabilisers. This method focuses on the disposable income channel only.
The budget balance semi-elasticity (ϵ) estimates the percentage point change in the budget balance-to-GDP ratio for a one percentage point change in the output gap. It can be written in terms of the weighted average of revenue and expenditure elasticities with respect to the output gap (Price, Dang and Botev, 2015):

$$\epsilon = \left[\frac{R}{Y} \Sigma \frac{R_i}{R} (\eta_i - 1) - \frac{G}{Y} \Sigma \frac{G_j}{G} (\eta_j - 1) \right] \tag{11}$$

where R is total government revenue, G is total government expenditure, η is an estimated elasticity of the level of i-th revenue or j-th expenditure item with respect to the output gap, and Y is nominal GDP. The semi-elasticity can also be written in terms of aggregate revenue and expenditure elasticities:

$$\epsilon = (\varepsilon_{r.y} - 1) \left(\frac{R}{Y} \right) - (\varepsilon_{g.y} - 1) \left(\frac{G}{Y} \right) \tag{12}$$

where $\varepsilon_{r.y}$ is the elasticity of aggregate revenue with respect to the output gap, and $\varepsilon_{g.y}$ is the elasticity of aggregate expenditure with respect to the output gap.

In 2015, the OECD calculated New Zealand's total budget elasticity to be 0.51 (Price, Dang and Botev, 2015). Using this estimate as a baseline, we will consider the impact of some illustrative policy changes on this estimate, where this is possible. As noted, automatic stabilisation depends on the cyclical sensitivity of revenue and expenditure components and their size. The main budget components are shown in Tables 3 and 4. For tax revenue, the OECD estimates that corporate tax has the highest elasticity with respect to the output gap of 2.38, followed by personal income tax (1.23) and indirect taxation (including GST) (1.22). While corporate taxation has the highest elasticity, it constitutes a smaller proportion of revenue than personal and indirect taxation. Other revenue sources are not assumed to be cyclical, such that aggregate government revenue is estimated by the OECD to have an elasticity with respect to the output gap of 1.11.

The OECD categorises expenditure into unemployment-related transfers, earnings-related social transfers, and other expenditure. Unemployment-related transfers include New Zealand's Jobseeker Support (Work Ready) payment. Earnings-related social transfers include the Family Tax Credit, In-Work Tax Credit and other forms of supplementary assistance. Unemployment-related transfers are more sensitive to the output gap than earnings-related social transfers, but are a much smaller proportion of expenditure. Other expenditure is assumed to have zero elasticity. Thus, total primary expenditure is estimated to have an overall elasticity with respect to the output gap of -0.18.

Table 3 – Revenue automatic stabilisers

	Sensitivity to economic cycle (elasticity of revenue to output gap)	**Size of revenue source** (Percentage of GDP, 2019)
Personal income tax	1.23	12.8
Indirect taxes	1.22	12.6
Corporate income tax	2.38	4.0

Source: Price, Dang and Botev (2015), OECD *Revenue Statistics*

Table 4 – Expenditure automatic stabilisers

	Sensitivity to economic cycle (elasticity of expenditure to output gap)	Size of expenditure (Percentage of primary expenditure, 2005-2011 average)
Unemployment-related transfers	-3.37	1.6
Earnings-related social transfers	-1.09	11.1
Total primary expenditure	-0.18	100.0

Source: Price, Dang and Botev (2015)

In the next section, we will consider the following broad revenue and expenditure items in terms of their potential to strengthen the automatic stabilizers: personal income tax, corporate tax, social welfare expenditure and government purchases.

Personal income taxation

Personal income taxation is a key element of automatic stabilisation because tax revenues respond automatically to the business cycle. The more progressive the tax structure, the more sensitive tax revenues are to the economic cycle (since higher progressivity implies average tax rates rise with income).

In principle, greater progressivity of the personal income tax system can increase automatic stabilisation. However, there are significant considerations for efficiency and equity. These considerations include the impact on incentives for labour supply, saving and investment, and the integrity, coherence and horizontal equity of the tax system. It is unlikely that stabilisation benefits would dominate such considerations in setting the permanent tax structure.

We consider the impact of a recent change to tax progressivity to illustrate the potential impact on the automatic stabilisers. From 1 April 2021, New Zealand introduced a new top marginal tax rate of 39 percent on income above $180,000 per annum. Although this change was motivated by revenue and distributional considerations rather than macroeconomic stabilisation, we estimate its effect on the sensitivity of revenues. The elasticity of personal tax revenue with respect to income can be estimated by:

$$\varepsilon_{tk,tbk} = \frac{MR_{tk}}{AR_{tk}} = \frac{\sum \omega_{ki}(mr_i)}{\sum \omega_{ki}(ar_i)} \qquad (4)$$

In this equation, $\varepsilon_{tk,tbk}$ is the elasticity of tax on income component k with respect to its base, MR_{tk} and AR_{tk} are the weighted average marginal and average rates, ω_{ki} is the income share of the kth income category of income tax at income level i in total k^{th} income, and mr_i and ar_i are the marginal and average rates by income level (Price, Dang and Botev, 2015).

The impact of this change in tax progressivity on the automatic stabilisers is very small. It increases the budget balance semi-elasticity by 0.2 percentage points. In other words, the budget balance would automatically offset an additional 0.2 percent of a change in the output gap. This is insignificant in the context of the overall automatic stabilisers absorbing around 51 percent of a change in the output gap. It is unsurprising that the new top tax rate has not made a large difference to automatic stabilisers as it only affects a relatively small

part of the income distribution. However, it nevertheless highlights that large changes in the tax structure would be required to make a material difference to automatic stabilisation.

Alternatively, the underlying choice of tax base could be considered. There has been previous policy consideration of the breadth of the capital income tax base (Tax Working Group, 2019). Broadening the capital income tax base could increase the sensitivity of the tax base to asset prices, although these options are not under consideration by the Government. Strengthening the link between the tax base and asset prices may enhance the counter-cyclicality of the budget balance to the extent that asset prices are correlated to the cycle. However, the relationship between output and asset cycles is not necessarily stable or predictable, especially with falling neutral interest rates. It is also unclear whether changes to capital income taxation would significantly stabilise consumption, since the tax incidence is likely to fall disproportionately on higher income households that may have low marginal propensities to consume. There is also a risk of discretionary pro-cyclicality in response to more volatile tax bases. This has been a particular concern in countries that rely on asset-based tax bases during asset bubbles (Price and Dang, 2011).

Company taxation

Company tax revenues contribute to automatic stabilisation (Baunsgaard and Symansky, 2009). This is largely because of the cyclicality of the underlying tax base. While corporate taxation has a proportional (flat) rate schedule, generally corporate tax systems do not allow full relief for losses. If losses cannot be cashed out as a tax rebate, there is an asymmetry that is pro-cyclical relative to a purely proportional tax (Devereux and Fuest, 2009).

Devereux and Fuest (2009) present evidence from the United Kingdom that corporate taxation is not particularly stabilising of investment expenditure. This is because the main stabilising effect is through the reduced tax liability, which affects the internal funds available for investment by credit-constrained companies. They find that most credit-constrained firms were in a tax loss-making position.

The stabilising properties of corporate taxation could be strengthened by increasing loss carry-forward and carry-back provisions (Baunsgaard and Symansky, 2009). These provisions smooth corporate profits, thereby smoothing business incomes which could support stable investment and reduce the chance of financial distress.

Loss carry-forward provisions apply the current year's net operating loss to future years' net income. New Zealand companies can generally carry forward losses, even if there is a significant change of ownership of a business as long as the business continues without major change. The loss continuity rules were reformed in 2021 to enable greater loss carry-forward. The objective of this reform was to enhance firms' access to capital, especially for small and medium enterprises, rather than to enhance macroeconomic stabilisation.

Loss carry-back provisions apply the current year's net operating loss to a prior year's tax return, resulting in the ability to claim a tax refund in the current year for the previous year to which the loss is applied. New Zealand companies cannot generally carry back losses, although a temporary loss carry-back scheme was implemented in response to COVID-19. This allowed businesses expecting to make a loss in either the 2020 or 2021 year to use the loss to offset profits they made the year before. Temporary loss carry-back schemes were implemented in a number of countries in 2020/21 (eg, Australia, Austria, Belgium, Czech Republic, Norway, Poland and the United States).

Permanent introduction of loss carry-back could potentially enhance automatic stabilisation. This also has potential efficiency benefits due to firms smoothing their incomes over time. However, permanent schemes come with fiscal cost and a risk of abuse. The stabilisation

benefits may also be modest compared to other potential measures that could support business investment and cash flow. There may be merit in considering a loss carry-back that is activated in recessions, which would be a form of semi-automatic stabiliser.

Social welfare and social insurance

Social welfare payments and other transfers to households contribute to automatic stabilisation. Some welfare benefits provide timely and temporary stabilisation where payments are linked to cyclical factors such as unemployment and income. Welfare payments can be targeted at lower-income households that may have higher marginal propensities to consume than other households.

The contribution of social welfare expenditure to automatic stabilisation is somewhat limited by its size. For example, unemployment benefits are a smaller automatic stabiliser than direct taxes in 23 OECD countries where estimates are available (Maravalle and Rawdanowicz, 2020a).

In principle, welfare payments could be made more stabilising by increasing their size or their sensitivity to the economic cycle. However, clearly the design of a welfare system will largely depend on social preferences for redistribution and efficiency considerations. Moreover, the Government announced increases in main benefit levels in Budget 2021.

To illustrate the potential quantitative effect of changes in the welfare system, we model an illustrative 50 percent increase in Jobseeker Support expenditure. This is purely illustrative and does not relate to any particular policy proposal. Moreover, it uses historical data as a baseline and therefore does not take into account the recently announced changes to payment levels. For modelling purposes, we assume additional expenditure is financed from additional tax revenues with the same composition as the current revenue structure. Therefore, this scenario models an increase in the size of government and an increase in the cyclical sensitivity of expenditure (by increasing the proportion of government expenditure that is linked to unemployment). We estimate the impact on New Zealand's budget balance semi-elasticity using the OECD's parameter estimates. We find that this scenario would change the elasticity of primary expenditure with respect to the output gap from -0.18 to -0.21, while total expenditure and revenue would increase by about 0.4 percentage points of GDP. The budget balance semi-elasticity is estimated to increase from 0.51 to 0.53. Thus, the budget balance would absorb an additional 2 percentage points of the output gap. This represents a moderate increase in automatic stabilisation.

A potential reform to increase macroeconomic stabilisation would be to introduce a social unemployment insurance scheme in New Zealand. The Government has announced that it is looking at such a scheme. Social unemployment insurance schemes typically replace a proportion of lost earnings during short-term unemployment. While social unemployment insurance would have a range of potential microeconomic efficiency and equity objectives, it has the potential to be a source of macroeconomic stabilisation.

Social unemployment insurance regimes take many different forms. Its impact will depend on the specific design details and the behavioural responses of individuals, including how it affects precautionary saving behaviour. Much of the analysis of social insurance has focussed on its long-term efficiency and welfare implications (eg, Chetty, 2006). More recent literature attempts to use models that include nominal rigidities and other frictions to estimate the potential macroeconomic stabilisation effects (eg, McKay and Reis, 2016; Chodorow-Reich and Coglianese, 2019; Kekre, 2021).

According to the framework for assessing the effectiveness of its automatic stabilising properties, social unemployment insurance fares well. It is potentially timely and temporary

because income is replaced immediately upon job displacement. It is also well-targeted because it targets those whose spending potential would otherwise drop. Moreover, unemployment insurance has the potential to support aggregate demand by reducing precautionary saving, even by those who are not receiving payments (Chodorow-Reich and Coglianese, 2019).

Social unemployment insurance would have a range of potential efficiency benefits and costs that require analysis. For example, it may improve job search and matching while also having potential for moral hazard (Maravalle and Rawdanowicz, 2020b; Chetty and Finkelstein, 2013). United States policy discussion includes consideration of how unemployment insurance settings depend on macroeconomic conditions, which is an example of a semi-automatic stabiliser.

Government purchases

The size of government is a determinant of the size of the automatic stabilisers and has been shown to be correlated with lower output volatility (Fatas and Mihov, 2012). This is because government purchases (eg, healthcare and education expenditure) tend to be a relatively stable component of GDP. Combined with tax revenues that are broadly proportional to GDP, relatively stable government expenditure is a significant contributor to automatic stabilisation.

There is wide variation in size of government across the OECD. For example, government consumption expenditure varies from 11 percent of GDP in Switzerland to 25 percent of GDP in Sweden (Figure 5). New Zealand's government consumption expenditure is 19 percent of GDP, which is around the median of OECD countries. The variation illustrates that there are material choices that societies face.

Figure 5 – Government consumption expenditure, 2019
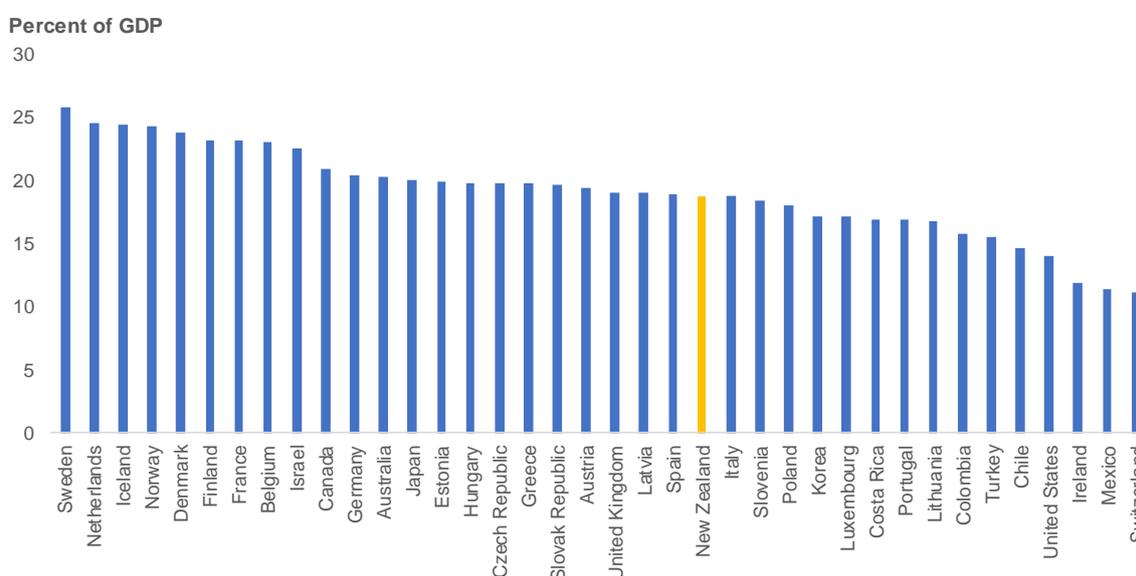
Source: OECD

If the size of government revenue and expenditure increased by 1 percentage point of GDP, holding the composition of revenue and expenditure constant, New Zealand's budget balance semi-elasticity would increase by 1 percentage point. This relatively modest impact shows that there would need to be a large change in government size to have a significant impact on automatic stabilisation.

Increasing the size of government could contribute to more stable aggregate demand. However, choices around the size of government would clearly have major implications for the role of the state, public services, economic efficiency and welfare (The Treasury, 2011; Fournier and Johansson, 2016). It is doubtful that macroeconomic stability considerations would materially alter judgments about the socially optimal size of, for example, public healthcare or education.

Nevertheless, structural changes in government revenue and spending should be monitored for their macroeconomic implications. For example, a materially larger government size may imply less need for discretionary counter-cyclical policy. A range of long-term structural forces have the potential to influence trends in government expenditure, including the ageing population, healthcare costs, infrastructure requirements, and policy responses to income inequality and climate change.

Options for discretionary or semi-automatic stabilisers

In a state where monetary policy is constrained, fiscal policy may need to play the dominant role in macroeconomic stabilisation (Blanchard and Summers, 2020). The automatic stabilisers may not be sufficient in such circumstances. An advantage of discretionary or semi-automatic policies is that they can be calibrated – in size or targeting – depending on the shock. In particular, if the policy regime needs to be state contingent, these instruments can be operated like a switch rather than a dial.

While there are institutional differences between discretionary and semi-automatic policies (in term of the degree of discretion), the potential set of fiscal instruments is largely common. In this section, we discuss a subset of potential instruments that could be deployed as discretionary policies or potentially triggered by a rule. We consider the main areas of government revenue and expenditure with a focus on measures that have been used internationally. The review is not a comprehensive review of every potential policy measure.

There are important questions about the macroeconomic effects of the potential instruments, under what conditions might they be deployed and the administrative feasibility. We shall discuss the options in terms of standard criteria for fiscal stimulus of being temporary, timely and targeted.

There would be value in further research that considered the key design issues. This should consider the design choices, the channels that policies operate and the appropriate policy response to different types of shocks and monetary policies. The relevant questions include whether tax/transfer interventions should be delivered to businesses or households? Whether and when interventions should be in the form of grants, loans or tax measures? How policies work through different channels including consumption, investment and net exports?

Income tax/transfer system

An option for fiscal support would be to use the tax and transfer system to increase the disposable incomes of households. This could be delivered in a range of ways: as a temporary income tax reduction, lump sum payments to individuals or targeted welfare payments. This would provide fiscal stimulus to the extent that households increased their consumption spending.

These options have the advantage that they can be designed to be temporary. The timeliness and targeting depends partly on administrative constraints and there are

questions about their stimulatory effect. Tax reductions or transfers to households may not stimulate the domestic economy if payments are saved or spent on imports.

The form of a payment matters for the household spending response. Lump sum payments have been found to have greater stimulatory impact than increasing incomes through gradual, regular payments (Sahm, Shapiro and Slemrod, 2012).

While New Zealand has not implemented lump sum payments as a fiscal stimulus policy, there are international examples of this type of policy including the United States and Australia. There is an empirical literature studying the macroeconomic effects of payments to individuals in other countries (Souleles, 1999; Shapiro and Slemrod, 2003; Johnson, Parker and Souleles 2006; Agarwal, Liu and Souleles, 2007; Misra and Surico, 2014; Coronado, Lupton and Sheiner, 2005; Shapiro and Slemrod, 2009; Parker, Souleles, Johnson and McClelland, 2011; Sahm, Shapiro and Slemrod, 2012; Leigh, 2012; Neri, Rondinelli and Scoccianti, 2015).

The international evidence suggests that a proportion of lump sum payments are spent on consumption quickly by households. The marginal propensities to consume out of lump sum payments are generally found to be around 30 to 60 percent as a central estimate. This is large enough to suggest that such payments could be an effective tool for fiscal stimulus.

There would need to be consideration of the size, form and targeting of payments as well as administrative constraints. The optimal size of payments would depend on both the nature of the macroeconomic shock (eg, output gap) and the microeconomic behavioural considerations. A small payment may not be sufficiently salient to affect spending behaviour. However, if payments become very large, the marginal propensity to consume may diminish.

Effective targeting of payments may not be possible because of administrative constraints. The evidence suggests liquidity constraints are a key determinant of marginal propensities to consume. However, the government does not hold information on the liquidity of individuals. Marginal propensity to consume may be correlated with income. However, the tax system generally holds information on an individual's previous year of taxable income, so would not be able to take account of income changes generated by a contemporaneous economic shock. Common design approaches have been near universal lump sum payments, often with a phase out for high income individuals (based on previous annual income).

There would also need to consider broader efficiency and equity considerations. The use of tax and transfer system could enable a degree of targeting of distributional objectives. There would be a need to consider incentive and efficiency effects in policy design.

Administrative considerations are potentially a significant constraint on policy design and timeliness. Therefore, developing systems in 'normal' times would help prepare policymakers to implement stimulus policies when shocks occur. There are currently two main operational agencies for the tax and transfer system: Inland Revenue and the Ministry of Social Development. Tax administration systems may be more appropriate to administer large-scale, broad policies to individuals, whereas the welfare system can target support for existing recipients. Inland Revenue's Business Transformation programme has modernised the tax administration system offering greater policy flexibility than in the past.

Consumption tax rate

Another form of fiscal stimulus that could be considered in the future would be a temporary reduction in the Goods and Services Tax (GST) rate. This could stimulate household consumption through both income and substitution effects, assuming that GST rate changes would be passed to consumers. It would be critical that changes were credibly temporary,

both for its effectiveness in stimulating behavioural responses and to ensure revenue sustainability. Temporary consumption tax rate cuts were implemented as stimulus measures by the UK during the GFC and by a few countries in response to the COVID-19 shock (including Germany, UK and Ireland). A variable GST rate was suggested as a supplementary stabilisation instrument for New Zealand by Buiter (2006).

The substitution effect arises because if consumers believe that the reduction in GST is temporary, they will be incentivised to bring forward spending, creating a stimulatory effect in the period when there is an aggregate demand shortfall. Therefore, a temporary GST cut has similarities with changing the interest rate, which also changes the relative price of consumption between the present and future.

Changes to the conventional interest rate tool would generally be superior to a variable GST rate instrument (Claus and Sloan, 2008). However, if monetary policy is constrained, a temporary GST rate cut may be an effective way to stimulate consumption spending.

There is limited evidence available on the macroeconomic effects of such a policy. There is some evidence on consumer spending responses from looking at the effect of announced increases in consumption tax rates. The evidence suggests that future consumption tax rate increases do lead to an increase in spending prior to the rate increase, although the magnitudes differ across studies (Cashin, 2011; Cashin and Unayama, 2011; Crossley Low and Sleeman, 2014; Cashin and Unayama, 2021).

There are important questions of implementation feasibility and compliance costs to consider. A delay between announcement of a future consumption tax rate cut and implementation would have a counter-productive effect of encouraging consumers to delay purchases. The timeliness of a temporary rate reduction is unclear. There would need to be further analysis of the administrative and private sector capacity to make changes to systems and the compliance costs for businesses. The GST rate was increased in 2010 with a period of around four months between announcement and implementation. However, international examples suggest much shorter periods between announcement and implementation are possible.

The distributional effects are likely to be complex. As New Zealand has a broad GST base, the incidence of the GST is roughly proportional with respect to the expenditure base. However, a temporary GST reduction may benefit those with high lifetime income and wealth more as they are better able to bring their spending forward.

Business subsidies, loans and tax incentives

A range of business-facing policies could also be considered. A range of such policies have been implemented in response to COVID-19 internationally. In New Zealand, a range of measures were also implemented including wage subsidies and small business loans. The New Zealand Wage Subsidy Scheme stands out for its timeliness and size. Following announcement in March 2020, around $12 billion in wage subsidy payments were made in the second quarter of 2020. Overall government transfers were around three times their usual size in that quarter (Figure 6).

Wage subsidies provide cash flow support to businesses and support workers to remain attached to firms. Wage subsidies have also been used in New Zealand in response to the Canterbury and Kaikoura earthquakes. The policy has can provide relief, stimulate aggregate demand and limit long-term damage to potential output by supporting business continuity and labour market attachment. The policy delivered considerable support to the New Zealand economy during the COVID-19 shock. The unemployment rate remained lower

in New Zealand than in many other advanced economies that did not make such extensive use of wage subsidies

Figure 6 - Government spending during the COVID-19 pandemic
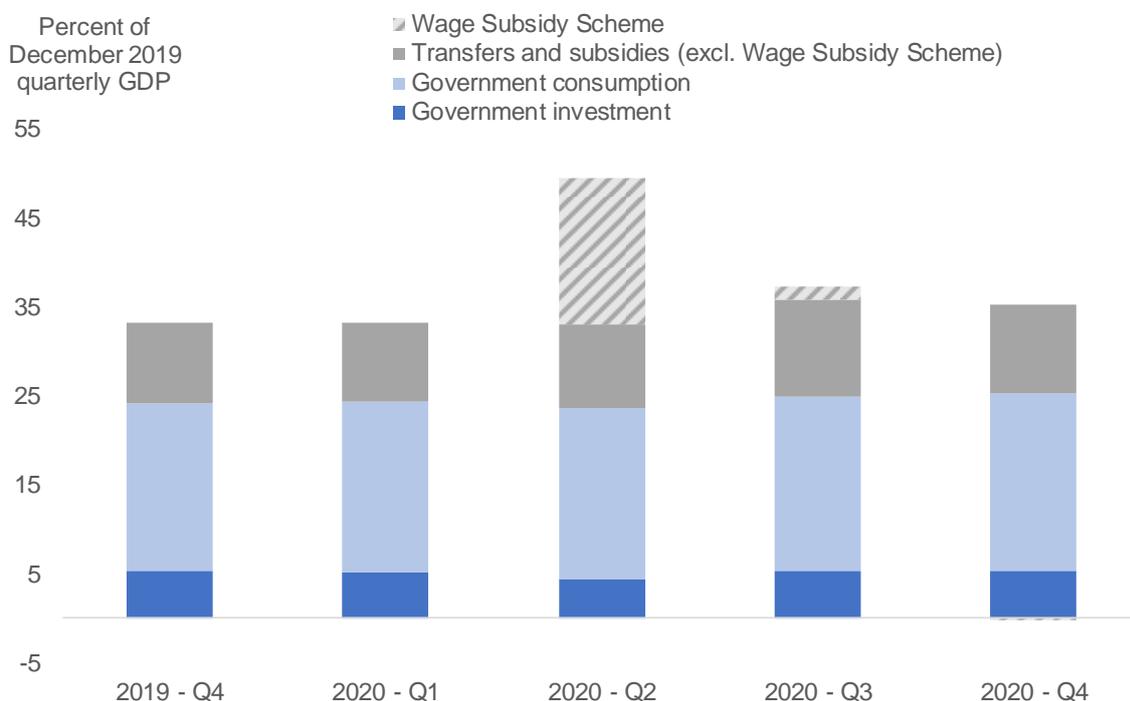
Source: The Treasury, Stats NZ, authors' calculations
Note: Chart displays transfers series from the Crown financial statements and nominal central government consumption and general government investment from Stats NZ's Gross Domestic Product December 2020 release.

Wage subsidies may be particularly suited to circumstances where there is a temporary supply disruption – such as in a natural disaster or pandemic. Whether they should be used where the main problem is an aggregate demand shortfall is an open question. There are also questions about their optimal design, including their duration since maintaining subsidies for long periods would inhibit re-allocation of resources across firms and sectors.

There is limited evaluation currently available on the effects of international measures in response to COVID-19 as they have been implemented recently. But there are already some studies that suggest that rich micro-datasets have the potential to offer insights about the effects of interventions. For example, studies on the United States Paycheck Protection Programme are already available (Autor *et al*, 2020; Hubbard and Strain, 2020; Granja, Makridis, Yannelis and Zwick, 2020).

Policies could also focus on other channels, such as business investment or hiring. With respect to business investment, the options could take various forms, such as investment tax credits, accelerated depreciation, full or partial expensing of business investment. These are mechanisms that would have the effect of reducing the cost of capital and, if implemented for a temporary period, encourage businesses to bring forward planned investments. A temporary expensing policy would shift the fiscal cost into the present, but increase revenues in the long term. There is some evidence that temporary bonus depreciation policies in the United States induced significant responses in plant and machinery investment (Zwick and Mahon, 2017).

Further research on the effects of such policies and how they compare to other potential instruments would be valuable. In particular, there is a need to understand what channels they operate, in what range of circumstances they could be deployed and how such policies could be calibrated and administered in an effective way.

Government consumption and investment

Discretionary changes in government purchases – either consumption and investment – could be considered. However, these are subject to greater challenges than taxes and transfers in being timely and temporary.

Public investment, such as infrastructure, is often put forward as an attractive fiscal stimulus option. Public investment has the potential to be temporary and targeted in the sense of having high fiscal multipliers while also providing long-term productivity benefits. However, infrastructure is often not timely due to the time taken for decision-making, planning, procurement, regulatory approval and construction. Leeper, Walker and Yang (2010) incorporate implementation delays in infrastructure investment into a macroeconomic model. They identify two types of delays: delays between appropriations and outlays ('time to spend') and construction timeframes ('time to build'). Their model suggests that such delays can materially reduce the short-term stimulatory effects of public investment. Ramey (2020) also finds that short-run multipliers from infrastructure investment are diminished by implementation delays, whereas long-term multipliers can be large.

Much public investment is set by institutional structures that are some degree of independence from central government fiscal strategy. This includes the National Land Transport Fund and local government operations. Further research would be desirable on whether these types of institutional settings have a material impact on macroeconomic stabilisation.

Government consumption spending is usually not temporary – or easily reversible – and therefore generally not a suitable candidate for macroeconomic stimulus. Temporary government consumption spending in response to certain shocks will have macroeconomic effects (eg, government responses to natural disasters or pandemics), but this would not generally have aggregate demand stabilisation as its objective.

A key challenge for public financial management is ensuring value for money. Ongoing work to ensure quality expenditure involves examination of the base of expenditure and often taking longer-term time horizons than business cycles. As argued above, relatively stable government consumption levels is a form of automatic stabilisation, which could complement higher frequency changes to tax/transfer instruments that are more suited for cyclical management.

A further caveat is that the appropriate structural stance of fiscal policy will depend on macroeconomic conditions. This will depend on structural influences on the primary balance and interest-growth rate dynamics, as highlighted in the Treasury's long-term fiscal statements. A positive interest-growth rate differential in the long run implies a requirement for primary surpluses to maintain a stable debt-to-GDP ratio. But other scenarios are possible. For example, the secular stagnation hypothesis speculates that aggregate demand may be persistently weak and the economy may be dynamically inefficient (or at least have an interest rate below the rate of potential economic growth) (Rachel and Summers, 2019; Eggertsson, Mehrotra and Robbins, 2019). Under that hypothesis, persistent fiscal support for aggregate demand may be appropriate. This could include consideration of structural settings that influence private saving and the neutral interest rate. These issues go beyond the scope of this paper. But they highlight the need for diagnosis of both structural and cyclical macroeconomic conditions.

Conclusion

There is a need to re-assess the role of fiscal policy in light of structural challenges, especially the low interest rate environment. Fiscal policy will likely need to play a significant role in macroeconomic stabilisation in the future if monetary policy is constrained by the effective lower bound on interest rates. In particular, fiscal rules may need to become more contingent on macroeconomic conditions and monetary policy constraints. This suggests consideration of both automatic stabilisers, discretionary policies and semi-automatic stabilisers.

There are options to strengthen the automatic stabilisers. However, stabilisation objectives are likely to be dominated by broader efficiency and equity considerations in setting the permanent structure of the tax/transfer system. It is likely that changes to the automatic stabilisers would have to be large – in terms of the size and structure of the tax or welfare systems – in order to make a significant difference for macroeconomic stabilisation.

Development of tax and transfer instruments, operated either as discretionary policy or semi-automatic stabilisers, have potential as tools for macroeconomic stabilisation. They have the advantage that they can be calibrated to the size and nature of shocks.

There remain significant challenges to effectively operating counter-cyclical fiscal policy. These challenges include trade-offs with long-term efficiency and equity objectives, administrative feasibility, political economy constraints and debt sustainability. This underlines the need for:
- further research developing the evidence base on the range of potential instruments, including the administrative capacity to implement stabilisation policy effectively;
- consideration of fiscal frameworks to balance macroeconomic stabilisation and debt sustainability objectives and consideration of the need for state-dependent fiscal reaction functions; and
- consideration and coordination of the respective roles of fiscal and monetary policy.

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