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

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WORKING PAPER

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

Jenna Bernstein, Ben Gaukrodger and Oscar Parkyn New Zealand Treasury Working Paper 24/04 August 2024



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**Te Kāwanatanga o Aotearoa** New Zealand Government

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## Abstract

This paper considers the role of fiscal policy in New Zealand's macroeconomic stabilisation. New Zealand's macroeconomic framework is characterised by an institutional arrangement whereby monetary policy has the primary responsibility for macroeconomic stabilisation. In contrast, fiscal policy is generally oriented around medium-term structural goals and debt sustainability.

There is a need to reassess the role of fiscal policy in the wake of COVID-19 and structural trends. As has been the experience over recent economic cycles, fiscal policy may need to play a significant role in macroeconomic stabilisation in the future, especially if monetary policy becomes constrained by the effective lower bound on interest rates. This paper examines the high-level options for improving the effectiveness of counter-cyclical fiscal policy, including strengthening the automatic stabilisers, counter-cyclical discretionary policies and developing 'semi-automatic' stabilisers. There is a need to consider fiscal institutions and administrative capacity to implement stabilisation policy effectively and maintain debt sustainability.

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KEYWORDS

Fiscal policy; stabilisation; automatic stabilisers; semi-automatic stabilisers; discretionary fiscal policy.

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## **Executive Summary**

This paper considers the role of fiscal policy in stabilising the New Zealand economy. It provides an overview of the issues with the goal of increasing understanding and promoting debate. It is part of an ongoing stewardship programme at the Treasury that is considering New Zealand's macroeconomic frameworks and how approaches to macroeconomic policy may need to evolve in the wake of COVID-19 and structural trends in the economy.

The paper begins by outlining New Zealand's institutional arrangements and some contemporary macroeconomic challenges. New Zealand's macroeconomic frameworks are characterised by an institutional arrangement whereby monetary policy (in conjunction with a floating exchange rate) has the primary responsibility for macroeconomic stabilisation. In contrast, fiscal policy is generally oriented around medium-term structural goals and debt sustainability, albeit with the automatic fiscal stabilisers providing ancillary support for macro stabilisation. Since these institutional pillars were put in place, macroeconomic stabilisation has faced challenges from large global shocks – notably, the global financial crisis (GFC) and COVID-19 pandemic – alongside structural trends that have raised questions about the limits of monetary policy.

The paper continues by assessing the contribution of fiscal policy to macroeconomic stabilisation. Section 2.1 summarises the literature, concluding that while fiscal policy has material macroeconomic effects, uncertainty remains about the magnitude. Section 2.2 estimates the size of New Zealand's automatic fiscal stabilisers using different approaches. The empirical analysis suggests that New Zealand's automatic fiscal stabilisers play an important role in contributing to macroeconomic stabilisation and are of a similar size to the average of other OECD countries. Section 2.3 examines the behaviour of New Zealand's fiscal policy over recent economic cycles. New Zealand's fiscal policy is found to have operated in a broadly counter-cyclical manner over both downturns and upturns.

Section 3 considers the challenges that New Zealand's fiscal frameworks might face, and how they might evolve, were fiscal policy to put more weight on macroeconomic stabilisation objectives. The paper considers the implications of three broad strategies for making fiscal policy more stabilising. First, strengthening New Zealand's existing framework to support greater use of discretionary fiscal policy or by enhancing the automatic stabilisers. Second, reforms to fiscal institutions, decision-making and balance sheet management that would support fiscal policy to be operated in a more cyclical manner. Third, the introduction of a rules-based approach – known as semi-automatic stabilisers – whereby policy changes would be triggered automatically by certain macroeconomic conditions, such as a recession.

Section 4 considers the feasibility and potential impact of policy options to enhance the effectiveness of the automatic stabilisers. We introduce a framework for assessment that enables a quantitative indication of the materiality of potential changes to the automatic fiscal stabilisers, either through increasing their sensitivity to the economic cycle or increasing their size. This framework is used to consider changes to personal income taxation, welfare benefits and the overall size of government expenditure. In each case we find relatively modest stabilisation benefits. We conclude that any changes to the automatic stabilisers would have to be large to make a material difference for macroeconomic stabilisation. In addition, the stabilisation benefits of structural fiscal changes are likely to be outweighed by broader efficiency and equity considerations. Section 5 discusses options for discretionary policy and semi-automatic stabilisers for a number of potential fiscal instruments. We consider changes to the tax and transfer system, consumption taxes, business subsidies, and government consumption and investment. We briefly discuss the viability of different options in terms of the standard timely, temporary, targeted criteria for fiscal stimulus, as well as administrative considerations. We conclude that tax and transfer instruments, operated either as discretionary policy or semi-automatic stabilisers, have potential as tools for macroeconomic stabilisation, while also noting that significant challenges remain to effectively design and administer counter-cyclical fiscal policies. For this reason, there is a need for further assessment of potential policies and the associated fiscal frameworks, including how fiscal policy interacts and coordinates with monetary policy.

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

## **1** Introduction

### 1.1 Setting the scene

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

Fiscal sustainability refers to the requirement for the government to meets its intertemporal 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 Cruickshank, 2013; Debrun *et al.*, 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 *et al.*, 1999; Fournier and Johansson, 2016; Akgun *et al.*, 2017).

The stabilisation role refers to reducing macroeconomic fluctuations, such as excess volatility in output and employment, and supporting price stability (Allsopp and Vines, 2005).

These roles are inter-dependent and cannot be fully separated in analysis. The entire macroeconomic 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, in conjunction with a floating exchange rate, had the primary macroeconomic stabilisation role (with the automatic fiscal stabilisers also playing an important stabilisation role in the background). Fiscal policy was re-oriented around medium-term goals with a focus on debt sustainability and microeconomic efficiency (White, 2013).

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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 *et al.*, 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 *et al.*, 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 entails 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 a fixed exchange rate regime. The other caveat is that fiscal policy may be more effective in offsetting particular distortions or shocks. For example, fiscal policy may be more effective in responding to complex shocks that affect both aggregate demand and supply, such as the shock caused by the COVID-19 pandemic.

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 the problem of time inconsistency. Conversely, discretionary fiscal policy was subject to implementation lags and political processes that made it unsuitable for cyclical management. Proponents of these views 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 Governor of the Reserve Bank. Transparency and accountability mechanisms were focussed on achieving credibility for a significant disinflation.

New Zealand's inflation targeting regime evolved to provide for increased flexibility to stabilise the real economy, although price stability remains the pre-eminent objective (McDermott and Williams, 2018). The time horizon for inflation control has also lengthened, with a medium-term focus being made explicit in 2002. This evolution from strict 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 also influences aggregate demand and therefore inflation pressures (RBNZ, 2001). And public debt sustainability provides backing for the achievement of price stability (Sargent and Wallace, 1981). There has been frequent consideration of the respective stabilisation roles of fiscal and monetary policy in New Zealand.<sup>1</sup> There has been considerable attention to external imbalances and the negative impacts of high and volatile interest and exchange rates on economic performance. Proposed solutions included strengthening fiscal balances (Lane, 2013), reducing fiscal pro-cyclicality (Brook, 2013) and designating certain fiscal instruments for stabilisation (Ball, 1996; Buiter, 2006; Schmitt-Hebbel, 2006). Following the global financial crisis (GFC), attention turned to the coordination issues in an environment of subdued inflation, low interest rates and alternative monetary tools (Makhlouf, 2018; RBNZ, 2022b). This included the impacts on asset prices and financial stability from low interest rates, and the interaction of monetary, fiscal and macro-prudential policies (White, 2013; Dunstan, 2014).

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 policy and monetary policy in setting its fiscal strategy.<sup>2</sup> This formulation retained the notion that monetary policy had the primary responsibility for stabilisation but made clear that policymakers should consider the implications of the fiscal stance for macroeconomic stability and the fiscal-monetary mix.

Internationally, there was a reappraisal of the role of fiscal policy after the GFC. This reassessment reflected broader macroeconomic developments, including persistently low inflation and interest rates in the decade that followed the GFC (Blanchard, 2023). Furman and Summers (2020) argued that "active use of fiscal policy is essential in order to maximize employment and maintain financial stability in the current low interest rate world". According to Blanchard, Felman and Subramanian (2021), there was a "new fiscal consensus" for advanced economies that fiscal policy needed to be the main macroeconomic policy tool to address chronically weak private demand in the context of low interest rates. Blanchard (2023) acknowledged that the general recommendation to use fiscal policy for macroeconomic stabilisation was much too general, contrasting with the granularity of advice on monetary policy.

Prior to the COVID-19 pandemic, 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 Reserve Bank of New Zealand's (RBNZ) policy interest rate, the Official Cash Rate (OCR), was cut to 0.25% and alternative monetary policy tools were implemented.

<sup>&</sup>lt;sup>1</sup> 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).

<sup>&</sup>lt;sup>2</sup> The legislation did not prevent 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, and therefore transparent, in their fiscal strategy.

Substantial fiscal expansions were implemented in many advanced economies, including New Zealand, in response to the COVID-19 pandemic. The fiscal expansions supported public health responses and measures to cushion the economic impacts on households and businesses. The subsequent economic recoveries were more rapid than many forecasters expected. Inflation increased significantly above target owing to a mix of demand and supply factors. Central banks responded to the high inflation and tight labour markets by increasing interest rates. This experience suggests that fiscal policy can indeed have powerful macroeconomic effects and underscores the need for an improved understanding of the role of fiscal policy in macroeconomic stabilisation.

The global increase in inflation that emerged following the COVID-19 shock led to a significant monetary tightening by central banks . The consequent increase in nominal interest rates meant that the effective lower bound on interest rates became a less pressing policy concern during this period. However, the global, neutral, real interest rate is estimated to remain low and expected to remain low in the future, although there is considerable uncertainty (IMF, 2023). This implies that global policy interest rates may need to return to low levels, as observed prior the pandemic, in the future.

For New Zealand, the RBNZ estimates the neutral policy interest rate using a range of estimation techniques. In early 2024, a simple average of these methods suggested New Zealand's real neutral interest rate was around 0.5 percent, slightly above the low estimated during the pandemic, although there is considerable uncertainty around these estimates and the future evolution of the neutral rate (Castaing *et al.*, 2024). While some of the models in the RBNZ suite suggest that the downward trend seen in estimates of the real neutral interest rate have stalled or reversed, the estimates suggest that interest rates are likely to revert toward pre-pandemic levels after inflation has been brought back to target levels. Therefore, looking beyond the current business cycle, the issues raised in this paper are likely to be of continued relevance for macroeconomic policy.

### 1.2 Macroeconomic considerations

The following propositions, in combination, support the case to strengthen macroeconomic stabilisation policy and put greater weight on fiscal policy in doing so.

First, monetary policy has its limits. In particular, when the policy interest rate falls to its effective lower bound, monetary policy is constrained.<sup>3</sup> 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 *et al.*, 2019; Clarida, 2021). Low neutral interest rates have raised the likely frequency of hitting the lower bound.<sup>4</sup> With monetary policy constrained, fiscal policy is the only plausible alternative instrument for macroeconomic stabilisation (Allsopp and Vines, 2005). Consistent with the global trend, New Zealand's neutral policy interest rate is estimated to have materially declined in recent decades (Figure 1), increasing the likelihood of hitting the effective lower bound in the future. As noted above, although there has been monetary tightening in response to higher post-pandemic inflation, estimates of global neutral

<sup>&</sup>lt;sup>3</sup> 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).

<sup>&</sup>lt;sup>4</sup> The drivers of the fall in the neutral interest rate during previous decades are thought to include demographic change and migration, shifts in preferences for saving and investment, rising inequality, falling productivity, and policy changes that have lifted labour force participation. There is debate about these drivers, and the extent to which they will persist in the future (see for example Blanchard, 2019; Goodhart and Pradhan, 2020; IMF, 2023).

interest rates remain low. Furthermore, there are trade-offs associated with using unconventional monetary policy tools (BIS, 2019). Thus even when monetary policy is not completely constrained, it may not be the optimal policy choice.

Second, 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, known as hysteresis (Cerra, Fatás 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. Incorporating hysteresis effects may materially improve the cost-benefit calculus of counter-cyclical fiscal policy (DeLong and Summers, 2012; Fatás and Summers, 2018; Watson and Tervala, 2021).

Third, 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 (for example, by affecting leverage, asset prices and encouraging risk-taking) and distributional outcomes (Furman and Summers, 2020). And fiscal policy can be more timely and effective than monetary policy for addressing particular types of shocks, as illustrated during the COVID-19 pandemic (Woodford, 2020).

There is a further argument for considering the fiscal framework. Governments are most likely to implement fiscal responses to negative shocks. This has been the case during the COVID-19 pandemic when fiscal policies had to be designed, authorised and implemented with limited time, information and administrative capacity. 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.



Figure 1 – New Zealand OCR and estimated neutral rate

Notes: The shaded area indicates the range between the maximum and minimum values estimated by the Reserve Bank of New Zealand from a suite of neutral OCR indicators.

Source: Reserve Bank of New Zealand.

However, there are several countervailing arguments outlined below. These arguments underscore that the benefits of using fiscal policy for stabilisation are contingent, uncertain and require careful mitigation of risks.

First, the extent to which monetary policy is likely to be constrained in the future is uncertain. Unconventional monetary tools have been used and assessed to have effectively lowered rates. For example, the RBNZ implemented a large-scale asset purchase programme and a funding for lending programme in 2020, which they assessed to have reduced long-run bond yields by at least 50 basis points for a period (RBNZ, 2022a). Globally, the extensive use of monetary and fiscal stimulus in response to the COVID-19 pandemic, combined with significant supply disruptions, have also resulted in a considerable increase in inflation. Monetary policy has tightened in most advanced economies as a result, and the consequential shrinking of central bank balance sheets may give central banks more scope to influence long-term interest rates in future. However, while periods of higher inflation and positive output gaps are expected over the course of economic cycles, there remains a need to consider the risk of future downturns.

Second, the extent to which monetary policy faces structural constraints at the effective lower bound is also uncertain. A number of central banks have implemented slightly negative rates, and it could be argued that monetary constraints to further lowering rates 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 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, the efficacy of unconventional monetary policy tools and the potential for 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.

Third, uncertainty about macroeconomic conditions represents a key challenge for operating discretionary macroeconomic policy. In particular, there is a high degree of uncertainty about output gap estimates and the transmission of monetary and fiscal policy to the economy. It is therefore challenging to determine the appropriate fiscal stance *ex ante*, although this is also a challenge faced by monetary policymakers. Decision-making under uncertainty requires an understanding of fiscal-monetary interactions in the context of the prevailing macroeconomic environment. For example, the effective lower bound creates an asymmetry that is an important consideration for decision-making under uncertainty. When monetary policy is constrained, an unduly tight fiscal stance can cause output and employment to remain below their potential levels. However, if the fiscal stance is excessively expansionary, higher interest rates can restore output to its potential level. There is a need to consider the welfare effects of different choices.

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Fourth, there is a need to consider the impact of fiscal stabilisation policies on fiscal sustainability and on the quality of spending. While fiscal stimulus in a weak economy can improve fiscal sustainability (Auerbach and Gorodnichenko, 2017), there are political economy risks that fiscal expansions in downturns may not be unwound in booms and may lead to lower quality expenditure. Without budgetary discipline over the full economic cycle, discretionary fiscal policy can result in deficit bias. For example, as a result of time inconsistency, temporary measures may become permanent (Kumar and Ter-Minassian, 2007).

These risks need to be weighed up recognising that counter-cyclical fiscal policy may significantly improve welfare. There is a need for well-designed policies and institutions to guard against the four types of risk described above. Given uncertainty about the neutral interest rate in the future, any fiscal framework would ideally be robust to challenges that might arise at the effective lower bound, but also if the structural decline in interest rates were to reverse.

# 2 The contribution of fiscal policy to macroeconomic stabilisation

## 2.1 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) increases 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 higher future tax burdens (known as the Ricardian equivalence proposition (Barro, 1974)). A second objection is that higher aggregate demand would lead to higher interest rates (and a higher 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 crises or an increase in risk premia that reduces economic growth. These objections have 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 fully, such as finite time 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). Households 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. When there is spare capacity in the economy, one would expect there to be less crowding out. Moreover, in a small open economy where monetary policy is constrained by the effective lower bound, theory suggests fiscal stimulus can be effective in lifting output. In this situation, if fiscal stimulus drives higher output and inflation expectations but not a nominal interest rate response (as the interest rate is constrained), real interest rates will fall, depreciating the real exchange rate and encouraging further expansion in activity (Riches, 2022).

#### 2.1.1 Fiscal multiplier estimates

The output effects of fiscal policy can be quantified 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 this case, there is no crowding out. A fiscal multiplier between zero and 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 multipliers since the GFC, resulting in more precise estimates (Ramey, 2019). Such estimates take account of the above channels in a dynamic setting, including Ricardian effects, crowding out and other channels. 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 that tax multipliers are even larger in magnitude (between 2 and 3 in absolute value, based on narrative time series estimates). Although other studies find smaller estimates of revenue multipliers (Batini et al., 2014).

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 (VAR) models (Claus et al., 2006; Dungey and Fry, 2009; Parkyn and Vehbi, 2014; Hamer-Adams and Wong, 2018). This work is built on by Lyu (2021) who extends the sample period, refines data methods and separately estimates 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 several business cycles. They are not able to consider the case of the effective lower bound as 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. Such methods are used by Gemmell *et al.*, (2011) 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 Stochastic General Equilibrium (DSGE) models can also be used to estimate the effects of fiscal policy. A key advantage of these structural models is that they can be used to investigate a range of scenarios and policies. Binning (2024) presents estimates using a small open economy monetary-fiscal DSGE model. Estimated with New Zealand data over 1994Q1 to 2019Q4, government consumption multipliers are found to be around 0.7 on impact in normal times. Binning (2024) uses the model to investigate the effects of fiscal policy when monetary policy is constrained by an occasionally binding effective lower bound on the policy interest rate. At the effective lower bound, government consumption multipliers are moderately larger than estimated in normal times because real interest rates fall. When the interest rate is pegged for at least two years, government consumption multipliers can be larger than 1 on impact. Binning (2024) notes that the estimated fiscal multipliers from the DSGE model are larger than recent VAR estimates for New Zealand, when evaluated at their respective peaks. The multipliers in the DSGE model are usually largest on impact and then decay with time, whereas estimates from the VAR studies have tended to estimate multipliers that are smaller on impact and peak after a number of quarters.

Other structural models used to investigate fiscal policy in New Zealand include IMF (2019) and Murray (2013). These studies also find that estimated fiscal multipliers are positive and their size increases when monetary policy is constrained by the effective lower bound.

Concerns about fiscal solvency will be most relevant where governments are near fiscal limits. Expectations of future fiscal policy will matter for financial prices and multiple equilibria are possible (Calvo, 1988). However, New Zealand appears some distance from its fiscal limits, given its relatively low public debt ratio (by international comparison). Whether the size of fiscal multipliers are reduced when fiscal reaction to public debt levels is included was tested by Parkyn and Vehbi (2014). 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.

Thus, we can conclude that discretionary fiscal policy has material macroeconomic effects. There remains uncertainty about the magnitude of its effects. In particular, the effects of different fiscal 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. DSGE models tend to estimate spending multipliers that are larger than tax multipliers (Ramey, 2019). Further research in this area would be desirable, especially for small, open economies such as New Zealand.

#### 2.1.2 The automatic stabilisers

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. For example, a progressive tax structure will mean that the tax-to-GDP ratio automatically increases (decreases) when the economy starts operating above (below) capacity, as the progressivity ensures that tax revenue increases (decreases) faster than GDP. The expenditure-to-GDP ratio will decrease (increase) when the economy starts 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. This means a different research approach is needed to that used to estimate fiscal multipliers, which deploys 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; Fatás 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).

There are several approaches to investigate the size of the automatic stabilisers in New Zealand: statistical approaches, micro-simulation approaches and macrosimulation approaches (Binning, 2024).

Statistical approaches attempt to measure the responsiveness of the budget balance to the economic cycle. They are derived from the method for estimating the cyclically-adjusted budget balance (Price *et al.*, 2015). The key indicator is the semi-elasticity of the budget balance with respect to the output gap. Using this approach, the size of New Zealand's automatic stabilisers is estimated to be similar to the average of OECD countries (see Figure 2).

Figure 2 – Size of automatic stabilisers in OECD countries (budget balance semi-elasticity)



Source: Price et al. (2015)

Microeconomic approaches provide a complementary lens by identifying the effect of the tax and transfer system in stabilising household incomes. While these approaches enable a more granular analysis of the impact of policies on household incomes, a limitation is that they do not capture the total macroeconomic effect of the automatic stabilisers. We make a microeconomic assessment of the automatic stabilisers in New Zealand using the Treasury's household micro-simulation model, TAWA (with full details in Annex 2). In this framework, we estimate the income stabilization coefficient (ISC), which is a measure of the direct cushioning effect of the tax and transfer system on household disposable income following a shock to households' market (labour and capital) income.

The ISC is a microeconomic indicator of the size of the automatic stabilisers. The results for households across the income distribution are presented in Figure 3. There are two shock scenarios considered: first, a reduction in all market incomes and second, an increase in the number of people unemployed. We find that the proportionate reduction in market incomes has an average ISC of 33 percent, while an increase in unemployment has an average ISC of 42 percent. The results show that the strength of the tax and transfer system in stabilising incomes differs across household types and depends on the type of macroeconomic shock. Moreover, the importance of different tax and transfer policies depends on the type of shock. In the first scenario, reduced taxes play the largest stabilization role, while benefit payments are more significant in the second scenario. Transfers (benefit payments and tax credits) 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.

The ISC indicator also helps to illustrate the trade-offs between stabilisation and longterm efficiency objectives. 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 (the proportion of earnings paid as taxes and lost due to benefit withdrawal if a person moves into employment). Therefore, a higher ISC corresponds to weaker work incentives.

The estimated ISC for New Zealand is very close to the average estimated for European countries. European Commission (2017) estimated the average ISC across European countries of 33 percent for an earnings shock (with the range across European countries in the sample from 20 to 45 percent).



Figure 3 – 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.

A full macroeconomic model is needed to entirely characterise the effectiveness of the automatic stabilisers, although such models will necessarily be dependent on the specific assumptions made and definition of effectiveness. Binning (2024) quantifies the effect of automatic stabilisers in New Zealand by simulating a small open economy DSGE model. It is found that the standard deviation of New Zealand's GDP would be around 16 to 20 percent higher in the absence of the automatic stabilisers. Output would be even more volatile in the absence of the automatic stabilisers when monetary policy is constrained by the effective lower bound. However, the reduction in output volatility is dampened when there is also a need to stabilise public debt. This illustrates the importance of considering debt sustainability and macroeconomic stabilisation objectives in an integrated manner.

## 2.2 The cyclicality of fiscal policy

While we have established that fiscal policy has significant macroeconomic effects, a further assessment is required to establish whether fiscal 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 New Zealand's fiscal stance, we estimate the size and timing of fiscal changes. In the case of discretionary and overall fiscal policy, we need to assess both the size and timing of changes over the economic cycle.

There is a literature that studies the cyclical behaviour of discretionary fiscal policy by estimating equations with an estimated fiscal rule or reaction function (eg, Golinelli and Momigliano, 2009; Fatas and Mihov, 2012; Bénétrix and Lane, 2013). The estimated fiscal rule typically captures how a fiscal variable (such as the budget balance) responds to the lagged fiscal variable, the 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):

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

$$\Delta PB_t = \alpha_0 + \alpha_1 \cdot PB_{t-1} + \alpha_2 \cdot DEBT_{t-1} + \beta \cdot GAP_{t \text{ or } t-1} + u_t$$
(2)

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 (1) and (2) given the presence of the lagged dependent variable on the right hand side.

We undertake a simple investigation of the behaviour of New Zealand fiscal policy using the approach of Golinelli and Momigliano (2009). The technical details and results are presented in Annex 1. It is appropriate to be very cautious about the inferences that can be made from this analysis. On theoretical grounds, it is unlikely that these simple reaction functions fully capture the fiscal policy-making process. 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. Endogeneity would bias downward estimates of fiscal cyclicality (Tovar Jalles *et al.*, 2023). Further, the sample size is very small as we use a relatively short time period (2005-2019) with annual data. Nevertheless, the approach can provide some indicative evidence about the degree of cyclicality of New Zealand's fiscal policy over the sample period.

Our regression results indicate that fiscal policy in New Zealand – both discretionary policy and the automatic stabilisers – has operated in a broadly counter-cyclical manner on average over the sample period (2005-2019). We also consider whether fiscal stabilisation has been 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). Our results suggests that fiscal policy has operated counter-cyclically on average in both upturns and downturns, although there are only a limited number of observations. While this result holds on average, fiscal policy has operated in a pro-cyclical manner in some years.

Our estimates complement other work that use a broader sample of countries, time periods and estimation techniques. For example, Tovar Jalles *et al.* (2023) present results using a novel dataset of time-varying measures on fiscal counter-cyclicality for advanced and developing economies between 1980 and 2021. This study pays special attention to addressing the endogeneity issues. They find that discretionary and automatic counter-fiscal cyclicality are both strong in advanced economies and counter-cyclicality has increased over the last two decades. Fatás and Mihov (2012) also present evidence that that fiscal policy generally operates in a broadly counter-cyclical manner in OECD countries.

## 3 Fiscal frameworks for macroeconomic stabilisation

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

The experience during the COVID-19 pandemic further demonstrates the ability of fiscal policy to respond in a counter-cyclical manner. However, the specific 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). In a stylised sense, the current fiscal policy paradigm 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 discussed in the previous section). It is useful to consider alternative reaction functions to conceptualise how fiscal policy could be operated in the future.

Common criteria for assessing counter-cyclical fiscal policy options in downturns are that they are timely, temporary and targeted (Elmendorf and Furman, 2008). When looking for options to enhance the counter-cyclicality of fiscal policy then, one approach is to consider the policy options that could meet these criteria. This would include options to strengthen the automatic stabilisers and/or discretionary counter-cyclical policy and would be consistent with New Zealand's existing fiscal framework. However, such an approach would present some practical challenges.<sup>5</sup>

In this context, Section 3.1 begins with a discussion of a central challenge for any fiscal framework – balancing flexibility and commitment over time.

In Section 3.2, we briefly discuss ways of strengthening the existing fiscal framework to support fiscal sustainability in this context, including through balance sheet measures and institutional settings. Section 3.2 also discusses the implications for New Zealand's fiscal framework of two further approaches to strengthen the stabilisation role of fiscal policy, and which differ more substantively from the status quo.

The first approach is to reduce discretion over certain parts of the budget while maintaining democratic responsibility for overall fiscal policy. Such an approach has been proposed by Solow (2005) and Buiter (2006), with delegation of a narrow set of discretionary fiscal instruments to an expert body with a stabilisation remit. This approach would replicate the constrained discretion of monetary policy conducted by an independent central bank.

<sup>&</sup>lt;sup>5</sup> For example, strengthening the automatic stabilisers would present efficiency trade-offs, while it is challenging to operate discretionary policy consistently across both downturns and upturns, risking deficit bias.

A second option discussed in the literature combines elements of both automatic stabilisation and discretionary policy. This approach sees policy changes (ie, changes in welfare settings) triggered 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 et al., 2021).

#### Flexibility versus commitment in fiscal 3.1 policy

Fiscal policy is the domain of political decision-making, given the broad range of objectives and distributional impacts. It also involves decisions that impact on future fiscal decisions. One consequence is that fiscal policy can suffer from a bias toward fiscal deficits. This is due to problems related to political economy and time inconsistency, whereby short- and long-term interests diverge (Calmfors and Wren-Lewis, 2011; Yared, 2019). For fiscal policy, a key tension exists between a government's short-term objectives (including economic stability) and its long-term fiscal sustainability objectives. Managing the challenge posed by deficit bias is therefore a central issue in the development of fiscal frameworks, which tend to focus on the appropriate degree of discretion available to policymakers.

Deficit bias might arise for various theoretical reasons, including differences in preferences and discount rates across demographic cohorts, policymakers not internalising the shared financing costs of debt (Yared, 2019) or strategic electoral competition (Persson and Svensson, 1989; Alesina and Tabellini, 1990).

More generally, Kydland and Prescott (1977) showed that many policy decisions face a fundamental problem of time inconsistency, even absent political challenges. In a simple theoretical framework, governments with the discretion to re-optimise plans over time can find that their policies will lack credibility. Consequently, expectations and behaviours are influenced, meaning that even with optimising behaviour, discretionary policy making results in lower welfare than under commitment.

The literature on both monetary and fiscal policy offers insights into the design of a framework that can cope with time inconsistency. Monetary policy frameworks offer lessons for designing a framework explicitly focused on macroeconomic stability. In many advanced economies, the institutional arrangements for monetary policy are 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.<sup>6</sup>

Fiscal frameworks generally have certain legislated rules that govern the broad parameters of fiscal policy. Kopits and Symansky (1998) argue that fiscal rules that ensure commitment can overcome the problem of deficit bias, helping governments to achieve a sustainable long-term fiscal position.

There is a vast literature on central bank independence and monetary policy framework design (see for example Barro and Gordon, 1983; Rogoff, 1985; and Walsh, 1995).

Strict rules limit flexibility however, which can be costly given that rules cannot possibly set out an optimal response for every possible shock or situation (Yared, 2019). The Kydland-Prescott framework of dynamic inconsistency was applied to fiscal policy by Bianchi and Menegatti (2012), finding that commitment is not always superior to discretion. They find that uncertainty in the outlook strengthens the case for discretion rather than fixed rules, but when debt-to-GDP ratios are high commitment may be superior.

Consequently, there are trade-offs between designing rules that approximate optimal fiscal policy and rules that are designed to counteract deficit bias. Portes and Wren-Lewis (2015) warn that a risk of designing fiscal rules entirely around the imperative of eliminating deficit bias is that such rules may lead to severely sub-optimal outcomes. They suggest rules that are effective at reducing deficit bias, yet do not stray too far from optimality, are clearly desirable if they can be found. They also note that 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. For example, if the fiscal forecasts are made by an independent, credible body.

According to Fall, Bloch, Fournier and Hoeller (2015) fiscal rules should have two objectives: to anchor fiscal policy expectations by targeting a prudent debt level and to allow for macroeconomic stabilisation. There is a further trade-off between these two objectives since fiscal expansion in recessions increases uncertainties surrounding the debt path.

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. Complicated, and often over-determined, rules have been associated with low rates of compliance (Eyraud *et al.*, 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). For example, the loss of enforceability can be mitigated by enhancing the reputation costs of breaching rules (Debrun and Jonung, 2019).

An alternative view is presented by Blanchard, Leandro and Zettelmeyer (2021) in the context of debate about the European Union's fiscal framework. They observe that 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. 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. New Zealand's principles of responsible fiscal management are an example of fiscal standards.

# 3.2 Frameworks for different approaches to fiscal policy

#### 3.2.1 Strengthening New Zealand's existing framework

The main features of New Zealand's existing fiscal framework are its emphasis on principles of fiscal responsibility, transparency, and independence in reporting, standards and audit. The Public Finance Act 1989 requires 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: between 1994 and 2021 the operating balance (before gains and losses) has been in surplus in 68 per cent of the fiscal years, while government debt measured as a percentage of GDP has fallen by 15 percentage points over the same period.

This fiscal framework has endured over more than three decades. It is flexible to changes in fiscal strategy and, to a degree, to changes in the fiscal reaction function. As noted above, strengthening the automatic fiscal stabilisers and/or using discretionary counter-cyclical policy to make fiscal policy more stabilising could largely be accommodated within the existing framework.

Changes to some elements of the framework may be warranted, however, particularly where discretionary policy is relied on more for stabilisation when monetary policy is constrained. For example, using discretionary fiscal policy asymmetrically to stabilise the economy in downturns implies that fiscal policy may need to be tighter on average during economic expansions to maintain long-term fiscal sustainability.<sup>7</sup> Moreover, if more weight is placed on stabilisation objectives relative to sustainability in the fiscal reaction function, the risk of deficit bias may increase. Reforms to balance sheet management and institutional settings could provide opportunities for strengthening the existing framework.

#### **Balance Sheet Measures**

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.

<sup>&</sup>lt;sup>7</sup> While this applies in a static sense, it is worth noting that debt dynamics when interest rates are low may mitigate that to some extent by lowering finance costs and increasing fiscal space. Piscetek, 2019, establishes a framework to analyse New Zealand's public debt dynamics.

In New Zealand, maintaining debt at prudent levels has been the primary means of providing resilience, by ensuring there is sufficient fiscal headroom to cope with economic shocks. In this way, a prudent level of debt acts as a form of self-insurance. The New Zealand Government also relies on international insurance markets to provide resilience to some types of natural disasters. State-contingent debt, such as catastrophe bonds, could serve a similar function – for example catastrophe bonds would see a premium paid in normal times, while the obligation to pay interest and repay the principal is either deferred or reduced when a pre-defined event occurs. However, the international use of sovereign state-contingent debt instruments has been limited outside of debt restructurings. Such instruments are subject to a range of complications that have limited their attractiveness to issuers (IMF, 2017).

The composition and maturity structure of the government's liabilities and assets is important for fiscal resilience. This can be supported by taking a deliberate approach to measuring and managing financial risks to the consolidated sovereign balance sheet (Irwin and Parkyn, 2009). One specific proposal is that fiscal policy could be made more resilient to uncertainty by increasing the length of debt maturities (Orszag *et al.*, 2021). This would account for uncertainty about future shocks and interest rates, and asymmetry of the interest rate risk caused by the effective lower bound. Longer maturities could avoid abrupt and costly fiscal policy adjustments should interest rates spike.

Sovereign wealth funds are another option for balance sheet management that have been implemented by countries for a variety of purposes, including stabilisation. New Zealand has a sovereign wealth fund, the New Zealand Superannuation Fund, for the purpose of inter-generational tax smoothing and sustainability of the public pension system (Bell, 2021). Brook (2011) considers the establishment of a stabilisation fund that could safeguard revenue windfalls in the New Zealand context. In this proposal, governments could pre-commit to hold windfall surpluses to counteract deficits run during recessions. This approach would decouple expenditure decisions from revenue windfalls, enabling the government to more easily promote fiscal sustainability in light of political economy pressures.

#### Institutions

Relative to many other advanced economies, one element that is absent from New Zealand's institutional framework for fiscal policy is an independent fiscal institution (IFI). While the role and nature of such institutions vary across countries (OECD, 2016), they typically support sound and sustainable fiscal policy by enhancing transparency and accountability. Given that a greater reliance on discretionary policy during downturns risks introducing deficit bias, the introduction of an IFI might be one practical means of countering such bias by increasing reputational costs of unsustainable or sub-optimal fiscal policies.

It is also worth considering the coordination of monetary, macro-prudential and fiscal policy. There is a wide literature on the importance of monetary/fiscal coordination and numerous motivations exist.<sup>8</sup> For example, Sargent and Wallace (1981) demonstrated the importance of fiscal discipline as a prerequisite for monetary stability, because monetary policy reacts to accommodate the budgetary consequences of fiscal policy when the fiscal deficit is predetermined and unsustainable. In the extreme, fiscal dominance can see the solvency constraint of the government determining inflation outcomes.

<sup>&</sup>lt;sup>8</sup> See Lambertini and Rovelli (2003) for a comprehensive overview of the different reasons for monetary and fiscal policy coordination.

At the effective lower bound, additional coordination challenges arise. Two such scenarios are discussed by Cecchetti (2018). First, coordination can ensure a least regrets policy mix if expansionary fiscal policy and unconventional monetary policies can act as substitutes for each other during a crisis response. Second, monetary and fiscal policies can directly interact in the context of debt management policy. A fiscal authority lengthening the average maturity of debt (as discussed above) can partially offset the monetary authority's efforts to reduce the yield on long-term nominal assets through quantitative easing or large-scale asset purchases (LSAPs) (see also Greenwood *et al.*, 2014 and McLiesh, 2021).

In practice, institutional arrangements are such that monetary policy is adjusted more frequently than fiscal policy. Independent central banks take account of fiscal policy in setting monetary conditions (Lambertini and Rovelli, 2003). A question is whether the challenges posed by the effective lower bound warrant changing that dichotomy in any way? As a starting point, further research on the effectiveness, and costs and benefits, associated with unconventional monetary policy tools, including the interactions with fiscal policy, would be helpful. Better understanding the role macro-prudential policies can play in offsetting some of the costs and risks associated with very low interest rates and unconventional monetary policy tools, thereby facilitating a different monetary and fiscal mix, would also be valuable. Similarly, since the COVID-19 pandemic response, the Reserve Bank of New Zealand has highlighted the importance of better understanding the economic effects of fiscal policy tools (RBNZ, 2022b).

#### 3.2.2 Constrained discretion in fiscal policy through delegation

As noted above, there have been various proposals to translate aspects of institutional settings for monetary policy to fiscal policy. The idea is that, by delegating control of some aspect of fiscal policy to a technical committee that is insulated from political dynamics, fiscal policy will be able to play a greater and more effective role in stabilisation.

One such proposal is for the establishment of a Fiscal Policy Committee (FPC), constituted in a manner similar to a typical monetary policy committee, with an overriding obligation to ensure debt remains sustainable in the long-term, but with freedom in the short-term to run a budget balance fit for economic conditions (Wyplosz, 2005). Practically, this could see a FPC setting annual operating balance targets in an early stage of the budget process, which then binds the government's budget decisions.

A similar approach is discussed by Solow (2005) who suggests that a feasible method might be for an FPC to have control over a limited and standardised stabilisation package. This would mean that those with delegated authority would be able to make discrete expansionary or contractionary adjustments within limits. Solow contends that constrained discretion is necessary, on the basis that wide control over expenditure and taxation decisions brings distributive and allocative trade-offs, which realistically cannot be separated from politics. He concludes however, that if control is tightly constrained, then automating the process (as per the semi-automatic stabilisers discussed next) might be a simpler solution.

A further variation, whereby a technocratic committee controls the GST rate in New Zealand, enabling it to vary across the economic cycle, has also been proposed as a means of managing modest cyclical fluctuations (Buiter, 2006). However, Buiter dismisses further use of discretionary fiscal policy tools for stabilisation purposes, outside of deep recessions or liquidity traps, on the grounds that lags would likely make such policies ineffective.

While all slightly different, each of these approaches seeks to overcome the problem of time inconsistency by entrenching discretion in institutions with the credibility to adhere to their commitments. 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." While it seems plausible to assign clear and achievable objectives to an FPC, it is likely that the private sector will only believe the objectives will be achieved if they also believe the institutions will be durable. This in turn suggests a strong political consensus would be required for such an approach to succeed.

Durability for any FPC would also depend on accountability, with most FPC proposals having accountability models similar to monetary policy committees. Buiter (2006) observes that, under such models, committees are formally accountable in the sense that they must explain and justify their actions. However, there is no effective or substantive accountability because typically there are no adverse consequences for independent authorities, other than criticism, for policy errors. For this reason, Buiter contends that it is essential that an FPC is established separately to the central bank, to avoid too much substantively unaccountable power being concentrated in a single institution. This would have consequences for monetary and fiscal policy coordination as each committee would need to coordinate with the other, as well as with the government.

#### 3.2.3 Semi-automatic stabilisers

Semi-automatic stabilisers 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. In addition, semi-automatic fiscal stabilisers can help overcome the time inconsistency problem through use of a rules-based approach, mitigate the risk of a lagged response, and offer advantages for coordination with monetary policy by setting out a clear fiscal reaction function. Notwithstanding these benefits, calibrating a fiscal reaction function that triggers expansion in a downturn or when monetary policy is constrained (or both) would pose several challenges for the fiscal framework.

To start with, uncertainty remains around which triggers and thresholds are optimal for implementing and withdrawing support. To date, there has been limited use of semi-automatic stabilisers, and there is no academic consensus (Dong *et al.*, 2021). The literature offers insights around the design principles however: triggers should be reliable, timely, transparent, easily communicated to the public, informative about the extent of the required fiscal response and free from external influence, although the different criterion can often be in conflict (Dong *et al.*, 2021; Baunsgaard and Symansky, 2009; Sahm, 2024).

One example of a proposed implementation trigger is the Sahm rule (Sahm, 2019). Under this proposal, developed for the United States economy, fiscal support would be triggered when the three-month average national unemployment rate rises 0.5 percentage points or more relative to its 12-month low. The justification for this rule is that it has proved to be a reasonably timely indicator for recessions in the United States (where unemployment data is available at monthly frequency). This rule would also enable continued fiscal support if unemployment is persistently high (Dong *et al.*, 2021). Sahm (2024), proposes a rule calibrated for New Zealand. Under that specification, fiscal support would be triggered by a more than 0.5 percent quarterly decline in real consumption and an increase in the unemployment rate relative to its low in the prior four quarters, although no support would be triggered if core inflation was above 3 percent.

Another example of a trigger has been proposed by Eichenbaum (2019). Under this rule, fiscal support should be triggered when monetary policy reaches the effective lower bound, and end when the actual short-term rate policy rate returns to the long-term neutral rate. Should an economic downturn be accompanied by a large pessimistic shock to expectations of future growth, a fiscal stimulus may be required even before the effective lower bound is reached (Evans *et al.*, 2008). In such a situation, a fiscal response triggered by inflation falling below a certain threshold could seek to prevent an expectations-driven liquidity trap.

In terms of withdrawing support, Feldstein (2007) proposes a threshold of when the employment rate begins to rise or reaches its pre-downturn level.

One general challenge for semi-automatic stabilisers is identifying options that suit the range of conditions that might be experienced. For example, experience shows that during a financial shock such as the global financial crisis, a public health emergency such as COVID-19, or a natural disaster, direct fiscal assistance to support the economy and wellbeing can be effective. The tools used in each of these situations has been diverse, including deposit guarantees, cash payments to households, wage subsidies, tax changes and various business support measures.

Another general challenge is that pre-announcement of policies that will be triggered in response to a downturn can introduce moral hazard, changing expectations, incentives and behaviours.

It should also be noted that semi-automatic stabilisers rely on data to operate effectively. For example, while the Sahm rule for the US has been developed on the basis of monthly unemployment data, the calibration for New Zealand was reliant on data that is only available quarterly, which may undermine the timeliness of a response. A recession indicator relying on quarterly GDP data published almost three months after the end of that quarter, for example, could trigger a fiscal response once the recession has passed. Robustness is another issue, with most economic indicators subject to revision after initial publication. Significant errors in preliminary releases therefore risk triggering unwarranted policy responses, or undermining trust in the framework.

A different approach to state-contingent fiscal policy was the Australian government's announced fiscal strategy during the COVID-19 pandemic. Under that strategy the Australian government undertook to remain in deficit for the foreseeable future, committing not to focus on returning to surplus until the unemployment rate fell "comfortably" below 6% (Frydenberg, 2020). This strategy, analogous to forward guidance undertaken more regularly by central banks, committed to a state contingent fiscal response while avoiding some of the data issues that could arise where a semi-automatic stabiliser sets a precise threshold for withdrawing support.

In summary, beyond the analysis in Section 5 on potential policy options for semiautomatic stabilisers, 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). 4 Options for strengthening the automatic stabilisers

### 4.1 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. For example, McKay and Reis (2021) attempt to develop a tractable analytical method that may lead to useful insights about the optimal design of automatic stabilisers.

By their nature, automatic stabilisers meet the timely and temporary criteria for effective fiscal policy. Being automatic 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.

As discussed in section 2, there are a range of ways to estimate the effect of the automatic stabilisers. As a macro-simulation exercise, Binning (2024) explores increasing the strength of the automatic stabilizers to match the characteristics of countries with the strongest automatic stabilizers. The macro-simulation estimated a modest potential gain of around a 6 percent reduction in the standard deviation of GDP. However, this does not establish whether plausible policy changes could achieve these benefits given New Zealand's fiscal structure.

In order to provide quantitative estimates of the effectiveness of a specific and plausible policy change to the automatic stabilisers, we use the OECD's statistical method (Price *et al.*, 2015). This uses the budget balance semi-elasticity to measure the size of the automatic stabilisers, as was discussed in section 2.1.2. 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 budgetary semi-elasticity is also the key parameter in the model simulations presented in Binning (2024), which finds that there is an approximately linear relationship between the budgetary semi-elasticity and output gap volatility. In the simulations discussed above that achieved a reduction in the standard deviation of GDP of around 6 percent, the budgetary semi-elasticity was increased by around 20 percentage points.

The budget balance semi-elasticity ( $\epsilon$ ) can be written in terms of the weighted average of revenue and expenditure elasticities with respect to the output gap (Price *et al.*, 2015):

$$\epsilon = \left[\frac{R}{Y}\sum_{i=1}^{N} \frac{R_i}{R}(\eta_i - 1) - \frac{G}{Y}\sum_{i=1}^{N} \frac{G_j}{G}(\eta_j - 1)\right]$$
(3)

where *R* is total government revenue, *G* is total government expenditure,  $\eta$  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:

$$\epsilon = \left(\varepsilon_{r.y} - 1\right) \left(\frac{R}{Y}\right) - \left(\varepsilon_{g.y} - 1\right) \left(\frac{G}{Y}\right) \tag{4}$$

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

Using the OECD's calculations of New Zealand's total budget elasticity as a baseline, we consider the marginal impact of some illustrative policy changes on this estimate. 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 1 and 2. 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 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 of -0.18 with respect to the output gap.

Table 1 – Revenue automatic stabilisers	Table 1	1 –	Revenue	automatic	stabilisers
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	Sensitivity to economic cycle (elasticity of revenue to output gap)	<b>Size of revenue source</b> (percentage of GDP, 2019)
Personal income tax	1.23	12.4
Indirect taxes	1.22	12.2
Corporate income tax	2.38	3.9

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

#### Table 2 – Expenditure automatic stabilisers

	Sensitivity to economic cycle (elasticity of expenditure to output gap)	<b>Size of expenditure</b> (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 consider the following broad revenue and expenditure items in terms of their potential to strengthen the automatic stabilisers: personal income tax, corporate tax, social welfare expenditure, and government purchases.

### 4.2 **Policy options**

#### 4.2.1 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 change to income tax progressivity to illustrate the impact of a realistic policy change for the strength of the automatic stabilisers. From 1 April 2021, New Zealand introduced a new top marginal tax rate of 39% 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:

$$\varepsilon_{tk,tbk} = \frac{MR_{tk}}{AR_{tk}} = \frac{\sum \omega_{ki}(mr_i)}{\sum \omega_{ki}(ar_i)}$$
(5)

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,  $\omega_{ki}$  is the income share of the  $k^{\text{th}}$  income category of income tax at income level i in total  $k^{\text{th}}$  income, and  $mr_i$  and  $ar_i$  are the marginal and average rates by income level (Price *et al.*, 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 automatically offsets an additional 0.2 percent of a change in the output gap. This compares with the total effect of the automatic stabilisers absorbing around 51% of a change in the output gap. It is also very small compared to model simulations considered by Binning (2024). This 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. For example, 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. 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 with the business cycle. However, the relationship between output and asset cycles is not stable or predictable. 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).

#### 4.2.2 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.

#### 4.2.3 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.

In practice, 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, the design of a welfare system will largely depend on social preferences for redistribution and efficiency considerations.

To illustrate the potential quantitative effect of changes in the welfare system, we model an illustrative 50% increase in Jobseeker Support expenditure. This is purely illustrative and does not relate to any particular policy proposal. Moreover, it uses historical OECD data as a baseline and therefore does not take into account subsequent changes to benefit 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. Overall, 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 relatively modest increase in automatic stabilisation.

A potential reform to increase macroeconomic stabilisation would be to introduce a social unemployment insurance scheme in New Zealand. 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 also has the potential to be a source of macroeconomic stabilisation.

Social unemployment insurance regimes take many different forms. Its impact would 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, 2022).

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.

#### 4.2.4 Size of government

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 (Fatás 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 the size of government across the OECD. For example, government consumption expenditure varies from 11% of GDP in Mexico to almost 26% of GDP in Iceland (Figure 4). New Zealand's government consumption expenditure is 21% of GDP, which is slightly above the median of OECD countries. The variation illustrates that there are material choices that societies face.



#### Figure 4 – Government consumption expenditure, 2022

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.

## 5 Options for discretionary or semi-automatic policies

In situations 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 terms 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? How the introduction of semi-automatic policies affect the behaviour and expectations of households and businesses? Such a research agenda could draw lessons from the implementation of a wide range of fiscal measures implemented in response to COVID-19 (Deb *et al.*, 2021; Romer, 2021) and build on recent research considering how semi-automatic stabilisers could apply in New Zealand (Sahm, 2024).

#### 5.1.1 Personal 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 cash payments have been found to have greater stimulatory impact than increasing incomes through gradual, regular payments (Sahm *et al.*, 2012).

There are a range of international examples of lump sum cash payments with a fiscal stimulus objective, including during the GFC and economic response to COVID-19. There is also an empirical literature that predates the pandemic studying the macroeconomic effects of payments to individuals in other countries.<sup>9</sup> This 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% as a central estimate. This is large enough to suggest that such payments can materially stimulate aggregate demand.

Implementation of lump sum payments to households as a fiscal stimulus measure would require 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, the 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.

The use of lump sum payments to individuals is considered as a semi-automatic stabiliser in a New Zealand context by Sahm (2024). In that context, a noted advantage of such payments is that they are general enough to counter a fall in aggregate demand in a variety of situations, making them suitable for nearly all recessions. Further, the front-loaded nature of the intervention would reinforce the purpose of pre-positioning the intervention. 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 be consideration of broader efficiency and equity objectives. The use of the 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.

There are currently two main operational agencies responsible 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.

<sup>&</sup>lt;sup>9</sup> See for example, Souleles, 1999; Shapiro and Slemrod, 2003; Johnson *et al.*, 2006; Agarwal *et al.*, 2007; Misra and Surico, 2014; Coronado *et al.*, 2005; Shapiro and Slemrod, 2009; Parker *et al.*, 2011; Sahm *et al.*, 2012; Leigh, 2012; and Neri *et al.*, 2015.

#### 5.1.2 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). As noted above, 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.<sup>10</sup> 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 *et al.*, 2014; Cashin and Unayama, 2021). In Japan, consumption tax increases have been associated with output volatility (Lubik and Rhodes, 2019), suggesting that the reversal of any GST reduction would need to be carefully managed.

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.

<sup>&</sup>lt;sup>10</sup> Given practical limits on the ability to bring some spending forward, it is likely that there will be a disproportionate increase in durables expenditure. This may lessen the overall stimulatory effect, given that many durables in New Zealand are imported. The same applies to changes to monetary policy.

#### 5.1.3 Business subsidies

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 5).

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 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, with modelling suggesting that the policy preserved 6.5% of steady state employment relationships, equivalent to 175,000 jobs in the New Zealand labour market (Graham and Ozbilgin, 2021).



Figure 5 – 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 *et al.*, 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).

Another set of instruments relates to equity participations, public loans, and public guarantees that can be provided by governments or state-owned entities. A range of these instruments were deployed internationally by governments in response to COVID-19 (Kirti *et al.*, 2022). These types of instruments may be most suited to addressing particular types of financial market or credit market dysfunction. However, the heterogeneity of such measures makes it difficult to draw even a tentative assessment of their effectiveness.

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 through, in what range of circumstances they could be deployed and how such policies could be calibrated and administered in an effective way.

#### 5.1.4 Government consumption and investment

Discretionary changes in government purchases – consumption and/or 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 *et al.* (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.

In New Zealand, much public investment is set by institutional structures that have 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 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, under some alternative scenarios, 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 *et al.*, 2019). Under such a set of conditions, 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.

#### 5.1.5 Administrative considerations

Administrative constraints can reduce the effectiveness of any fiscal response to a shock. This is because limited administrative capacity can be a significant constraint on policy design and implementation timeliness. Therefore, developing administrative systems in 'normal' times would help prepare policymakers to implement more effective fiscal policies when shocks occur.

Administrative capacity can either be utilised more effectively or increased. In the short to medium term, a more effective solution is to utilise existing administrative capacity more effectively. This requires balancing the need for bespoke solutions to respond to a unique shock against having the standing capacity to respond quickly. Relying only on bespoke solutions is likely to result in undershooting the necessary fiscal response because of the significant amount of administrative capacity required to generate and operationalise bespoke fiscal responses. Constraints are especially binding during a shock. On the other hand, relying solely on the standing capacity of institutions risks long-term scarring if the underlying causes and idiosyncratic elements of the shock cannot be specifically targeted.

Therefore, a combination of standing capacity and bespoke outcomes is necessary. For example, New Zealand's Wage Subsidy Scheme was in existence prior to the COVID-19 pandemic, but was adapted to suit the idiosyncrasies of COVID-19, for example by having eligibility tied to public health restrictions. While still an enormous administrative burden for the administrating department, this allowed a rapid response, while also enabling the scheme to be well-targeted to the conditions. Greater reliance on automatic and/or semi-automatic fiscal stabilisers is another way of enabling more effective utilisation of capacity. These overcome administrative capacity constraints by being ready to operationalise without administrative input allowing implementation efforts to be focused on targeted discretionary measures.

Developing administrative capacity can require substantial investment with benefits realized over a long-term horizon. An example in New Zealand has been Inland Revenue's Business Transformation programme. This has modernised the tax administration system, offering greater policy flexibility than in the past.<sup>11</sup> It would be useful for further work to assess various public administrative systems with regard to their potential to deliver targeted and timely fiscal measures.

<sup>&</sup>lt;sup>11</sup> The system demonstrated its agility to implement a new lump sum transfer to individuals through the tax system in 2022. A Cost of Living Payment of \$350 was delivered automatically to the bank accounts of individual taxpayers who earned \$70,000 or less in the prior tax year and who were not eligible to receive the Winter Energy Payment.

# 6 Conclusion

There is a need to reassess the role of fiscal policy to support its effectiveness in future economic cycles and shocks. Fiscal policy may need to play a significant role in macroeconomic stabilisation in the future, especially if monetary policy is constrained by the effective lower bound on interest rates. In particular, fiscal policy 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, and the fiscal framework that governs the overall conduct of fiscal policy.

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 – 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 how different tools interact and 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 of the interaction and coordination of fiscal and monetary policies.

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# Annex 1 – The cyclical behaviour of fiscal policy in New Zealand

The behaviour of fiscal cyclicality in New Zealand is investigated using the method described in Golinelli and Momigliano (2009), as outlined in section 2.3. This annex presents the technical details and estimation results of this analysis.

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:

$$CAPB_t = PB_t - \epsilon_t GAP_t \tag{6}$$

where  $\epsilon_t$  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 the sensitivity of fiscal cyclicality to real-time data vintages. This would be worthwhile for further research.

There are a range of fiscal data sources available for New Zealand, including the System of National Accounts (SNA), Government Finance Statistics (GFS) and the Crown financial statements. For the fiscal balance, we use the central government net lending indicator from the SNA. This indicator is chosen because it is conceptually aligned to macroeconomic models of aggregate demand.<sup>12</sup> Net lending is a macroeconomic measure of the fiscal balance equal to revenue less transfers, government purchases (consumption plus investment) 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 measured as 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 percentage of GDP.

Table 3 presents results from estimating equations (1) and (2). 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 3. The results for the primary balance, and hence both discretionary and automatic stabilisers, are shown by models 2 and 4 in Table 3.

<sup>&</sup>lt;sup>12</sup> The GFS net lending indicator would also be suitable but has a shorter time series than the SNA net lending series. The net lending data in GFS and the SNA are similar in any case.

These results suggest that fiscal policy – both discretionary policy and the automatic stabilisers – has been counter-cyclical on average over the sample period (2005-2019). They also suggest 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  $\beta$  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  $\beta$  parameter is 1.24 and significant. The  $\beta$  coefficients in the lagged output gap specifications are larger than in the specifications using contemporaneous output gaps, although coefficient estimates are less precise.

Model	1	2	3	4
Dependent variable:	$\Delta CAPB$	$\Delta PB$	$\Delta CAPB$	$\Delta PB$
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 <sub>0</sub>	-0.02** (0.008)	-0.03*** (0.007)	-0.05*** (0.02)	-0.06*** (0.02)
α1	-0.51*** (0.14)	-0.51*** (0.12)	-0.68** (0.27)	-0.56 (0.38)
α2	0.15*** (0.05)	0.17*** (0.04)	0.31*** (0.09)	0.34*** (0.10)
Observations	14	14	14	14
R <sup>2</sup>	0.60	0.73	0.67	0.62

Table 3 – Estimated e	cyclicality of New	Zealand's fiscal balance,	2005 to 2019
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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.

We further test whether fiscal cyclicality is symmetric across the business cycle by separately estimating the responses to positive and negative output gaps. The equations are in the form below:

$$\Delta CAPB_t = \alpha_0 + \alpha_1 \cdot CAPB_{t-1} + \alpha_2 \cdot DEBT_{t-1} + \beta_0 \cdot GAP_t \cdot (GAP_t > 0) + \beta_1 \cdot GAP_t \cdot (GAP_t < 0) + u_t$$
(7)

$$\Delta PB_t = \alpha_0 + \alpha_1 \cdot PB_{t-1} + \alpha_2 \cdot DEBT_{t-1}$$

$$+\beta_0 \cdot GAP_t \cdot (GAP_t > 0) + \beta_1 \cdot GAP_t \cdot (GAP_t < 0) + u_t$$
(8)

Our results suggests that fiscal policy has operated counter-cyclically in both economic upturns and downturns. The hypothesis was investigated by estimating the average responses to positive output gaps (represented by the coefficient  $\beta_0$ ) and negative output gaps ( $\beta_1$ ) and whether they are significantly different. We find that both  $\beta_0$  and  $\beta_1$  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 for the United States that changes in cyclically-adjusted tax revenues do not correspond well to changes in discretionary tax policy identified from the narrative record.<sup>13</sup> 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 based on the estimates contained in budget documents for New Zealand. The following regression equation is estimated:

$$DTP_t = \alpha_0 + \alpha_1 \cdot DTP_{t-1} + \alpha_2 \cdot DEBT_{t-1} + \beta \cdot GAP_{t \text{ or } t-1} + u_t$$
(9)

where  $DTP_t$  is an indicator of discretionary tax policy 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 4. 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.

<sup>&</sup>lt;sup>13</sup> The narrative record approach relies on historical documents to identify and classify types of legislated tax changes based on the motivations provided by those involved at the time of passage.

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 <sub>0</sub>	-0.02*** (0.11)	-0.03*** (0.007)
α1	0.41** (0.15)	0.28** (0.16)
α2	0.09*** (0.02)	0.16*** (0.03)
Observations	15	15
R <sup>2</sup>	0.75	0.82

#### Table 4 – Estimating the cyclicality of discretionary tax policy changes

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.

## Annex 2 – A microeconomic perspective on the automatic stabilisers

A microeconomic approach can complement macroeconomic analysis of the role automatic stabilisers. Microsimulation models can be used to estimate the size of the automatic stabilisers at the individual household level by assessing how the tax and transfer system performs in stabilising household disposable incomes (Dolls et al., 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 et al., 2012; European Commission, 2017; Maravalle and Rawdanowicz, 2020a).

We 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).<sup>14</sup> TAWA models the effect of the New Zealand tax and transfer system on household incomes using data for the tax year 2020-21.

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

$$DI_h = MI_h + B_h + TC_h - T_h \tag{10}$$

Where:

 $DI_h$  is disposable income.

MI<sub>h</sub> 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 income taxes paid. This includes personal income taxation and the ACC levy.

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

$$ISC_h = 1 - \frac{\Delta DI_h}{\Delta MI_h} \tag{11}$$

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.

The income stabilisation coefficient measures the direct cushioning effect of the tax and transfer system on disposable income following a shock to market income (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:

$$ISC_h = \frac{\Delta T_h - \Delta B_h - \Delta T C_h}{\Delta M I_h}$$
(12)

The two income shock scenarios are chosen to reduce aggregate market income by 5%. The first scenario consists of a reduction in all market incomes and the second, an increase in the number of people unemployed.<sup>15</sup> We find that the proportionate reduction in market incomes has an average ISC of 33.0% (with a 95% confidence interval of  $\pm$  0.5%), while an increase in unemployment has an average ISC of 42.4% (with a 95% confidence interval of  $\pm$  1.0%).

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

<sup>&</sup>lt;sup>15</sup> Results are sensitive to modelling assumptions. The unemployment scenario is implemented as a reduction in market income of 5% 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% 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.