

The Requirements for Long-Run Fiscal Sustainability

Robert A Buckle and Amy A Cruickshank

New Zealand Treasury Working Paper 13/20

July 2013



THE TREASURY
Kaitohutohu Kaupapa Rawa

New Zealand Government

**NZ TREASURY
WORKING PAPER 13/20**

The Requirements for Long-Run Fiscal Sustainability

MONTH/YEAR

July 2013

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URL:

Treasury website at July 2013:
[http://www.treasury.govt.nz/publications/research-
policy/wp/2013/13-20](http://www.treasury.govt.nz/publications/research-policy/wp/2013/13-20)
Persistent URL: <http://purl.oclc.org/nzt/p-1586>

ISBN (ONLINE)

978-0-478-40370-1

ACKNOWLEDGEMENTS

We are grateful for comments received from Matthew Bell, Anne-Marie Brook, Neil Cribbens, John Janssen, Brian McCulloch, Bill Moran and Paul Rodway from the New Zealand Treasury; John Creedy, Norman Gemmell and Viv Hall from Victoria University of Wellington; Michael Reddell from the Reserve Bank of New Zealand; Graeme Wells from the University of Tasmania; Hon Sir Michael Cullen; participants at the New Zealand Association of Economists (NZAE) Conference on 27-29 June, 2012 in Palmerston North, the Treasury Long-Term Fiscal External Panel on 30 August, 2012, and the Affording our Future Conference on 10-11 December, 2012 at Victoria University of Wellington.

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Abstract

New Zealand, like many other countries, is experiencing a changing demographic profile from one dominated by young people during the 20th century to one where the population is more evenly distributed across age groups. This has implications for the economy and society, including the government's fiscal position in the future and for the sustainability of its spending programmes. This paper discusses the link between the government budget constraint and fiscal sustainability, how fiscal sustainability can be measured and why it's important. We also examine the Treasury's current approach to modelling the extent of fiscal adjustment required and options available to achieve this adjustment. The paper proposes criteria to evaluate potential policy changes to address these long-term fiscal challenges and suggests areas where further work could be worthwhile.

JEL CLASSIFICATION E61 Policy Objectives
E62 Fiscal Policy
H68 Forecasts of Budgets, Deficits and Debt

KEYWORDS Long-run fiscal sustainability; fiscal consolidation; public debt; public social expenditure; taxation

Executive Summary

New Zealand, like many other countries, is experiencing a changing demographic age structure which has the potential to increase the costs of state-funded, age-related government expenditure programmes such as public health care and superannuation. The Treasury's Long-Term Fiscal Model converts information from the government accounts, demographic and economic growth projections and current fiscal policy settings into forward projections of the governments operating balance and level of public debt. Projections using Treasury's LTFM suggest that population ageing and rising health costs will impact on the long-term sustainability of the government's current fiscal programme.

Fiscal sustainability refers to whether a government can maintain its settings for welfare, health, pension and other fiscal policies without major adjustments in the future, or whether its policies would lead to excessive accumulation of public debt unless the government takes action to change its policies. Although there are alternative fiscal anchors, the Public Finance Act 1989 requires that government maintains its total debt at "prudent" levels. A debt anchor has the advantage that it does not take a view on the optimal size and role of government, although for this reason it has also been criticised for providing weak a discipline on the levels of government spending and taxation. This has prompted suggestions for supplementary fiscal anchors, which are discussed in the paper.

In recent years New Zealand governments have managed to keep the level of public debt well within prudent levels. Although New Zealand's level of public debt is currently relatively low compared with many other developed countries, under current policy settings public debt is projected to increase from the late 2020s onward as the effects of population ageing and rising health costs lead to increasing operating deficits and rising public debt. This paper discusses the modelling assumptions underlying these projections and the effects of the timing of fiscal adjustment on the size of the operating surplus required to maintain a prudent level of public debt.

The paper also discusses why fiscal sustainability is important to economic wellbeing. The sustainability of the government's fiscal position can influence a government's ability to issue debt, and it can influence the cost of issuing debt. For these reasons, fiscal sustainability can also enable a government to respond to adverse economic and other shocks to wellbeing, and to smooth tax rates over time. It can also influence the likelihood of a higher country risk premium being added to the cost of borrowing faced by private borrowers. Fiscal sustainability also has distribution effects. From an inter-generational perspective, increasing public debt can be seen as an obligation passed from one generation of tax payers to the next. The paper also discusses how, through the effects on government spending and taxes, population ageing can have other distributional effects.

Governments require an appropriate decision-making framework to weigh-up fiscal policy options. This is because population ageing and fiscal adjustments required have economic, distribution and other implications for living standards, and because there is uncertainty surrounding the effects of population on fiscal projections. One such approach is the Treasury Living Standards Framework. The paper concludes by discussing how this approach can be adapted to the challenges of population ageing and used to weigh-up policy options to achieve fiscal sustainability.

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The Requirements for Long-run Fiscal Sustainability

1 Future fiscal challenges: An overview of the issues

The role of the state in New Zealand has continued to evolve in response to changing views of the appropriate functions of government, changes in social and industrial circumstances, and changes in the ability of the state to finance government programmes. The economic and social disruption caused by the two World Wars and the 1930s Depression was followed by an expansion in state welfare and social services; the post-war “baby boom” prompted growth in state provision of education services. The stagnation of economic growth during the 1970s and 1980s and the influence of economics and public sector management literature on economic policy prompted a change in the level and type of state involvement in the provision of a range of services. And today, New Zealand, like many other countries, is experiencing a changing demographic structure which has the potential to undermine the ability of the state to sustain the full range of its current services and therefore necessitate another phase of reprioritisation and restructuring of government programmes.¹

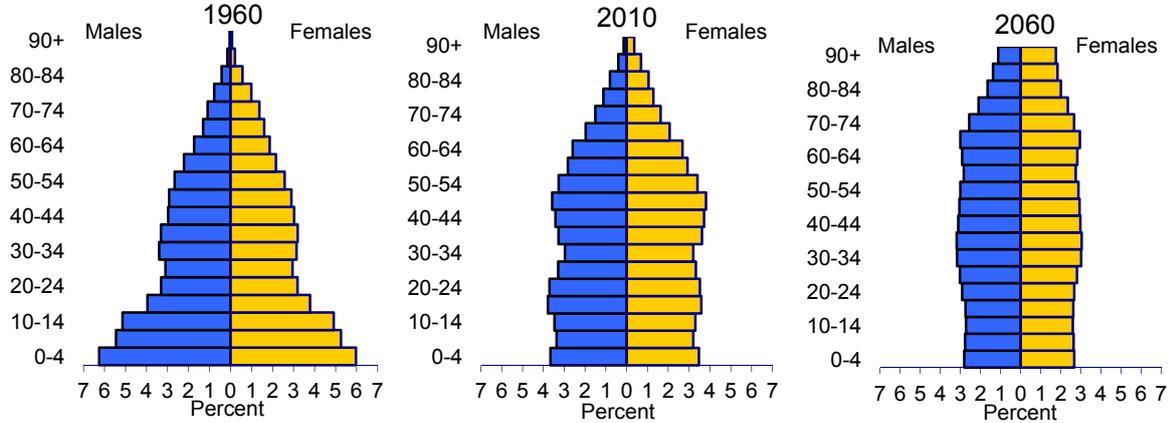
As a result of people having smaller families and living longer, New Zealand’s population structure is changing from one that was dominated by the young throughout much of the 20th century, to a structure that is becoming more evenly distributed over age groups. To illustrate this change and what is expected to happen in the next few decades, Figure 1 shows the distribution of males and females across 5-year-age brackets in 1960, 2010 and Statistics New Zealand’s projection for 2060. The figure illustrates what is typically referred to as “population ageing.” In 1960, the younger age groups contained much higher proportions of the total population than were contained in the older age groups. The consequence of reduced family sizes and people living longer is clearly evident in the figure for 2010 when there was a more even distribution of the population across the younger and middle age brackets. Statistics New Zealand projections imply that the area of fastest growth in New Zealand’s population will continue to move up the age groups and that by 2060 the proportions in the older age groups will be much higher than we have ever experienced.

The post-WWII “baby boom” is reflected in the middle-age “bulge” in the 2010 distribution. However, the effect of people living longer is also evident with the proportions in the older age brackets higher than in 1960. The proportions in the older age brackets have continued to increase while the proportions in the younger age brackets have continued to decline. In

¹ Auerbach (2011) evaluates fiscal projections to 2060 for 20 advanced economies. His results suggest that future primary balances (influenced by pensions, health care costs and taxation revenue) are typically much more important as a determinant of future increases in public debt than are initial levels of public debt.

other words, the change in the population structure we have observed and which is expected to continue is a structural change. The change would have happened even without the post-WWII baby boom, and in the absence of a major event or major change in behaviour it is unlikely to be reversed.

Figure 1: New Zealand population age structure, 1960, 2010 and 2060



Source: Statistics New Zealand

This changing demographic structure will have implications for the economy and the government’s finances. From a public finance perspective, research has shown that increasing numbers of older people can place more pressure on government spending programmes, whereas the level of taxation revenue will tend to be less affected. While people are living longer and are tending to stay healthier and economically active for longer, the combination of population ageing and age-related government programmes can place pressure on age-related public spending, such as spending on public health care and superannuation (see Office of Budget Responsibility, 2012). On the other hand, research suggests that under the present New Zealand taxation structure, the distribution of taxation revenue from income and consumption taxes may change, but the aggregate level of taxation revenue collected is not especially sensitive to the projected change to the population structure (Creedy et al., 2010).

While demographic change will not be the only factor influencing the government’s finances over the long-term, simulations can show the influence of demographic change on the government’s finances.² Those simulations show that with the expected ageing of the population, the government will need to make policy choices either to cut spending, to raise taxes, or to sell assets to keep debt at a sustainable level over the long term. Bell (2013) runs a hypothetical scenario where the age structure is assumed to be frozen in its current form into the future. Under this frozen age structure scenario, the government does not have a long-term fiscal debt problem, and would actually have the fiscal scope to retire existing debt, increase public spending, add to assets, reduce taxes, or a combination of these actions.

In 2004, the New Zealand Parliament passed legislation (Part 2 of the Public Finance Act 1989), requiring the Treasury to publish a statement at least every four years on the long-term fiscal position. To date, the Treasury has published two statements, one in 2006 and one in 2009. This legislation was born out of concern that demographic changes in particular

² In some spending areas non-demographic factors may have more influence on expenditure than demographic factors. For example, most research suggests that non-demographic factors, such as income growth and technological change, have historically played a larger role in the growth of health spending than demographic factors, such as population ageing (OECD, 2006).

could have implications for the feasibility of sustaining the prevailing fiscal programme. The reporting on these issues before these two statements had been somewhat ad hoc. The first two statements showed that, unless there was a significant change to fiscal programmes, government debt would reach historically high levels.

Fiscal sustainability is defined as the ability of the government to meet its current and future financial obligations. The government's financial obligations are determined by its taxation, spending, and borrowing decisions. Therefore, fiscal sustainability can refer to whether the government can maintain its policies without major adjustments in the future, or whether its policies would lead to excessive accumulation of debt unless the government takes action to change its policies (Pradelli, 2012). The Treasury's projections suggest that New Zealand's prevailing fiscal programmes are unsustainable over the longer term (New Zealand Treasury, 2006, 2009, 2013).

Fiscal sustainability is a challenge facing not only New Zealand. Similar long-term projection exercises undertaken for many other developed countries have found that fiscal consolidation is likely to be necessary to avoid high and unsustainable levels of public debt in the future (Sutherland et. al., 2012). Designing government fiscal programmes to ensure they are sustainable has important economic benefits, including enhancing the ability of governments to respond to adverse shocks, reducing the volatility of government expenditure and tax rates, and reducing the risk of sudden reversals of foreign lending and exchange rates. Many of these countries are therefore implementing shorter-term fiscal consolidation programmes, as well as policy changes that address longer term fiscal pressures arising from population ageing. A number of countries are, for instance, increasing the age of eligibility for public pensions to reduce demographically sensitive pension costs (including Australia, Greece, Ireland, Italy, Spain, the United Kingdom and the United States) (OECD, 2012).

The Public Finance Act (PFA) in New Zealand requires that government maintains its total debt at "prudent levels." There is no simple rule for determining what a prudent level of debt is, or for setting upper and lower bounds to recognise the uncertain environment in which fiscal policy is operated. But there are several issues that should be brought to bear on decisions about a debt target. These include the size of the fiscal buffer needed to respond to economic shocks; the implications of government debt for the risk premium on borrowing; and the role of debt in funding capital expenditure. Debt targets should also take into account expected future spending pressures, such as those resulting from population ageing, which may warrant the accumulation of financial assets, or a reduction of net debt to pre-fund some of these expected expenditure increases. Determining the appropriate government debt target should take into account the wider set of vulnerabilities facing the economy, including contingent liabilities, such as explicit or implicit guarantees of the financial sector, the risk and likely impact of natural disasters, as well as the level of private sector debt. The liquidity of the government's balance sheet is also an important factor, as this also influences the ability of the government's finances to withstand shocks.

New Zealand governments have significantly reduced the level of government debt since the mid-1980s and in recent years have endeavoured to reduce and maintain debt at no more than 20% of gross domestic product (GDP) (as a gross debt target by 2006 and a net debt target since 2009). The Treasury's Long-Term Fiscal Statements do not recommend a long-term government debt target, as this will change over time in light of some of the above considerations. For modelling purposes, the Treasury examines scenarios that constrain net government debt to 20% of GDP on average over time and show the sensitivity of the projections to different debt targets, eg, 0%, 10% and 30% net debt (Rodway, 2013).

The purpose of this paper is to discuss the relationship between the government budget constraint and fiscal sustainability and review reasons why fiscal sustainability matters. We then review the available measures of fiscal sustainability and what they imply about the sustainability of New Zealand's current fiscal programme. The focus of the paper is primarily on structural changes in government revenue and taxation, but implications for debt management through economic cycles is also touched on. In the event that fiscal policy is not sustainable, governments are faced with a range of choices about how and when to adjust fiscal settings. We review those issues and the types of trade-offs governments may need to confront. The paper is designed to provide a non-technical guide to the issues involved in the Treasury's third Long-term Fiscal Statement.

2 What is fiscal sustainability and how is it measured?

2.1 The inter-temporal budget constraint and fiscal sustainability

Fiscal policy can be examined through the three lenses of:

- Fiscal stability—the influence of fiscal policy on the business cycle and vice versa;
- Fiscal structure—the level and mix of public expenditure, taxation and government assets and liabilities; and
- Fiscal sustainability—the ability of the government to meet both current and future obligations (Barker et al., 2008).

Although fiscal sustainability is the main focus of this paper, these concepts are related because the choice of government expenditure programmes and how they are funded will impinge on fiscal stability and structure objectives. Fiscal sustainability can be expressed through the government's inter-temporal budget constraint over an infinite or a finite time horizon, as explained below.

Infinite horizon measures³

According to infinite horizon fiscal sustainability measures, the government's fiscal position is sustainable, if the government is solvent, that is, if over an infinite time horizon it will be able to repay all of its debt. This solvency condition can be expressed as the *government's infinite horizon inter-temporal budget constraint* as follows:

$$\sum_{s=n}^{\infty} \frac{t_s}{(1+r)^{s+1-n}} = \sum_{s=n}^{\infty} \frac{g_s}{(1+r)^{s+1-n}} + d_{n-1} \quad (1)$$

where n is the current (initial) time period, t_s is the nominal level of government revenue-to-GDP in year s , g_s is the nominal level of government spending-to-GDP, d_{n-1} is the inherited stock of public debt at time $n-1$, and r is the interest rate on government borrowing (defined as $r=(i-y)/(1+y)$, where i is the nominal interest rate and y is the growth rate of GDP; often referred to as the growth-adjusted interest rate). In expression (1), the present discounted value of government revenue-to-GDP must equal the present discounted value of government spending-to-GDP plus the initial stock of public debt. The above configuration of the government's inter-temporal budget constraint is an approximation used for illustrative purposes and abstracts from a number of considerations including the financial assets of the government, cash and accruals measures, as well as inflation.

The *infinite horizon inter-temporal budget gap (IBG)* measures the extent of inter-temporal balance and can be expressed as follows:

$$IBG = d_{n-1} - \left\{ \sum_{s=n}^{\infty} \frac{t_s}{(1+r)^{s+1-n}} - \sum_{s=n}^{\infty} \frac{g_s}{(1+r)^{s+1-n}} \right\}, \quad (2)$$

or

$$IBG = d_{n-1} - \sum_{s=n}^{\infty} \frac{t_s - g_s}{(1+r)^{s+1-n}}, \quad (3)$$

³ The description of infinite and finite horizon fiscal sustainability measures draws on Pradelli (2012).

where $t_s - g_s$ denotes the primary balance-to-GDP ratio (henceforth referred to as the primary balance). If there is a positive fiscal gap, then to close the gap the government will need to increase revenues, reduce expenditure, or a combination of the two. Other policies, such as structural reform to lift growth rates can also help to close the fiscal gap.

Finite horizon measures

The above measures define fiscal sustainability over an infinite time horizon. Fiscal sustainability can also be defined over a finite time horizon as the government meeting a debt target that is deemed acceptable at a certain future date. Whereas the infinite horizon measure constrains the government to repay all of its debts, the finite horizon measure can be used in more flexible ways, including by examining the implications of different debt targets for fiscal policy. The *finite horizon inter-temporal budget constraint* can be expressed as follows:

$$d_{h+n} = (1 + r)^{h+1}d_{n-1} - \sum_{s=n}^{n+h}(1 + r)^{n+h-s}(t_s - g_s), \quad (4)$$

where d_{h+n} is the target debt-to-GDP ratio at time $h+n$, where h is the finite time horizon to reach the debt target after period n , and s is any future time period; and d_{n-1} is the inherited stock of public debt-to-GDP. If the government wants the terminal debt-to-GDP target to equal the initial debt-to-GDP level, then it will need to run a primary surplus equal to the cost of servicing its debt, so that $t_s - g_s = rd_{n-1}$. This is often referred to as the *debt-stabilising primary balance*. As a simple numerical example, if the growth-adjusted real interest rate, $r=(i-y)/(1+y) = (6-3.5)/(1+3.5)=0.55$ and the initial stock of inherited debt, $d_{n-1} = 20\%$ of GDP, then to stabilise government debt at 20% of GDP, the government needs to run a primary surplus of $0.55 \times 0.2 = 0.11\%$ of GDP.

Governments often set finite horizon debt targets, because lenders will impose limits on the cost or ability of the government to borrow, if debt reaches certain levels. However, it is not clear *ex ante* when this might occur, as it will depend on the particular circumstances.

A limitation of the measure (4) is that the expectation that the government will not exceed a terminal debt target is itself insufficient to ensure fiscal sustainability. The path to get to the debt target is also important. For example, borrowing in early years, say for investment in infrastructure, may generate gross financial returns, if the investment generates user-pays charges or indirect returns via improved economic growth and tax revenue receipts. Even if the investment would be met by future revenues sufficient to satisfy the government's future debt target, it would not be feasible, if the peak level of debt in an intervening year goes above the level that creditors would be prepared to finance. This is part of the reason for New Zealand's fiscal responsibility provisions requiring "a prudent level of debt over time," rather than at some point in the future. The above example does not of course suggest that all infrastructure investment will necessarily generate financial returns sufficient to fund the investment. This will depend, among other things, on the nature and quality of the investment.

Another factor to be borne in mind is that, while the expected present value of the sum of future net cash flows might satisfy the terminal debt target, the future is not known with certainty and so there will be a distribution of possible outcomes. Therefore, an extra margin (a "fiscal buffer") is desirable to obtain a suitable level of assurance around fiscal sustainability. There are some complex measurement and modelling issues associated with examining how the government's fiscal position is likely to change in the future, especially when looking over the long term. Some factors are within policy control, such as entitlements to government welfare schemes, while others are less so, such as interest rates, and some are the outcomes of long-run and well-known trends, such as demographic change. As was

discussed in Section 1, demographic change in New Zealand may have a significant impact on future government primary balances and the future path of government debt. In this context, programmes like public health and superannuation, which when introduced involved a relatively large working-age population supporting a relatively small older population, if unchanged, will increasingly involve a relatively smaller working-age population supporting a relatively large older population.

From an institutional perspective, what is important for the debt target to be met and maintained is not necessarily that current policy be projected to satisfy the IBC in the future, but rather that the policy environment enables options for policy evolution to be explored and adopted over time as needed.

The inter-temporal finite horizon budget constraint can be rearranged to define the inter-temporal finite horizon fiscal gap, which is the change in the primary balance required to achieve a debt target at a certain point in time. This fiscal gap measure shows the change in the primary balance (via changes in taxes and/or spending) at a point in time required to reach a specified debt target at some point in the future, relative to where debt would be if the primary balance was determined by unchanged policy. The *inter-temporal finite horizon fiscal gap (FG)* can be expressed as follows:

$$FG = rd_{n-1} + \frac{r(d_{n-1}-d_{h+n})}{(1+r)^{h+1}-1} - \frac{r \sum_{s=n}^{n+h} (1+r)^{n+h-s} (t_s - g_s)}{(1+r)^{h+1}-1} \quad (5)$$

or rearranging, as:

$$FG = r \left[d_{n-1} + \frac{(d_{n-1}-d_{h+n}) - \sum_{s=n}^{n+h} (1+r)^{n+h-s} (t_s - g_s)}{(1+r)^{h+1}-1} \right] \quad (6)$$

If the inter-temporal finite horizon fiscal gap is positive, then that implies the need for the government to reduce future government expenditure or increase taxes to achieve the target debt ratio. If the fiscal gap is negative, then that implies the government is able to increase future government expenditure or reduce taxes and still achieve the target debt ratio. The fiscal gap measure will tend to be sensitive to the starting point that is chosen and where the economy is in the economic cycle.

The time horizon chosen over which to calculate the fiscal gap ($n+h$) may have an influence over whether policies are considered sustainable. For example, policies may be sustainable over a 10-year time horizon, but not over 40 years. This point is illustrated in Section 4 where we show how projections of government debt can look quite different as the time horizon is extended.

2.2 Measures and indicators of fiscal sustainability

Many governments around the world have begun to prepare projections of government finances over increasingly longer periods of time. This has been born out of concern that demographic changes in particular could have implications for the structure of government spending and revenue and the feasibility of sustaining the financing of the prevailing fiscal programme. Previous reporting on these issues had been somewhat ad hoc. The Public Finance Act (PFA) 1989 was amended in 2004 to require the Treasury to produce statements on the long-term fiscal position that look out at least 40 years into the future.

While traditional government financial statements provide information about past cash flows and assets and liabilities, they do not include information about the long-term financial implications of many government policies, including:

- (i) revenue that is expected to be realised in the future, but that is not recognised as assets (for example, expected future tax revenue), and
- (ii) expected future obligations that are not recognised as liabilities (for example, expected future spending on entitlements, social services, infrastructure, etc.) (International Public Sector Accounting Standards Board, 2012).

Long-term fiscal information can therefore be used to complement the government's core financial statements to indicate whether government policies are sustainable over the long term, or whether governments will have to tax more or spend less to meet fiscal sustainability conditions.

In order to determine whether the current path of fiscal policy is sustainable, one needs to define the current path. This is often difficult as policy is rarely clearly defined over the long-term and future economic performance and demography are not known with certainty. As is common with most other long-term fiscal projection models, the Treasury Long-Term Fiscal Model (LTFM) converts information from the government's accounts into forward-looking projections based on assumptions about the economy, demographics, government spending, transfers, taxation, assets and liabilities. This information is also valued by private sector agencies whose decisions are influenced by their assessment of future taxes, expenditure and public debt (such as credit-rating agencies concerned with assessing sovereign risk).

Various measures can be used to assess the future sustainability of the government's fiscal position. Some measures are based on the projected trend in fiscal aggregates, such as the operating balance, primary balance, gross debt, net debt or net worth. Other methods condense one or more time series of fiscal aggregates into single indicators, such as inter-temporal infinite horizon or finite horizon fiscal gaps.⁴ For all of these indicators, uncertainty in the projections tends to increase as the projection horizon increases. Table 1 summarises how these measures are defined, what they best measure, as well as their limitations.⁵

Generational accounts can also be used to assess the effects on different generations of alternative ways of satisfying the government's inter-temporal budget constraint. Generational accounts calculate the net lifetime taxes faced by people born in different years.⁶ A set of generational accounts was prepared for New Zealand in 1997 (Auerbach et al., 1997). However, generational accounts have not been widely used (Netherlands and Norway are the only countries now that prepare regular generational accounts) and the suitability for fiscal policy decisions is somewhat limited.⁷

⁴ There are also econometric techniques that have been developed to test the sustainability of government debt and deficits. Bohn (2007), for example, provides a critique of standard stationarity and cointegration techniques that have been used, and suggests alternative approaches that could be taken. As far as we are aware, these sorts of approaches have not been applied in the New Zealand context.

⁵ The measures are defined on a core Crown basis, as they have been in previous Treasury Long-Term Fiscal Statements (see, for example, New Zealand Treasury, 2009). The fiscal gap measures are defined more generically in the table. The definitions of government debt are discussed further in Section 4.1 of this paper. Since net debt is a cash concept, it is ultimately driven by cash receipts and cash expenditures, including capital spending, whereas the operating balance is an accruals measure. In recent years, the Economic and Fiscal Updates published by the Treasury have included a table that reconciles the government operating balance to changes in net government debt (for example, see Table 2.2 on page 26 of the 2012 Budget Economic and Fiscal Update).

⁶ Net lifetime tax is the discounted present value of tax paid and transfers and other government expenditure received over an individual's lifetime.

⁷ The OECD (2009b) notes, for example, that generational accounts compare net lifetime taxes of future newborns, but not people already alive today.

Table 1: Measures and indicators of fiscal sustainability

Measure	Definition	Best measures	Limitations
Operating balance	Core Crown operating balance: Projected core Crown revenues less projected core Crown expenses (plus projected surpluses from Crown entities).	Size and time profile of fiscal imbalances, including debt financing costs.	Underlying revenue and expenditure imbalance may be exaggerated by compounding financing costs.
Primary balance	Core Crown primary balance: Projected core Crown operating balance less projected net interest costs and unrealised valuation gains or losses on financial assets.	Size and time profile of fiscal imbalances, excluding debt financing costs and valuation gains or losses.	This measure does not capture financing costs of government borrowing, or changes in borrowing costs.
Gross debt	Core Crown gross debt: Projected core Crown debt issued by the sovereign less settlement cash held by the RBNZ.	Sustainability of government gross borrowing over the long-term, if current policies are maintained.	Does not take into account financial assets that could be used to offset debt.
Net debt	Core Crown net debt: Projected core Crown gross debt less projected core Crown financial assets (excluding advances and the NZSF, which is held for policy purposes).	Sustainability of government finances over the long-term, if current policies are maintained. Presents reduction as a % of GDP in the terminal year.	This measure introduces an additional uncertainty over the future value of government financial assets.
Net worth	Core Crown net worth: Projected core Crown net worth (assets and liabilities of the core Crown) based on Generally Accepted Accounting Principles (GAAP)	Sustainability of government finances over the long term, if current policies are maintained, based on a more comprehensive measure of government assets and liabilities.	This measure introduces more valuation requirements and further uncertainty over the future value of government assets and liabilities.
Inter-temporal infinite horizon fiscal gap	Inter-temporal infinite horizon fiscal gap: Projected permanent spending decrease or revenue increase necessary to pay off all government debt over an infinite time horizon.	Shows the extent of adjustment required in a single indicator. This approach can be useful to indicate whether the fiscal gap is tending toward a sustainable position.	Assumes it will be necessary to eventually wind-up all government assets and debt. Assumes all fiscal adjustment is undertaken upfront, rather than managed over time. This measure does not indicate the source of change in the fiscal gap.
Inter-temporal finite horizon fiscal gap ⁸	Inter-temporal finite horizon fiscal gap: Projected permanent spending decrease or revenue increase necessary to meet a debt target at a particular point in time.	Extent of adjustment required in a single indicator. Different adjustment scenarios (adjust now versus later) and extent of adjustment required across countries.	Requires a debt target and time period to be specified. Assumes all fiscal adjustment is undertaken upfront, rather than managed over time. Different time horizons may generate different results.

2.3 Long-term fiscal model

As mentioned above, the New Zealand Treasury LTFM converts information from the government's accounts into forward-looking projections of what would happen under certain assumptions.⁹ Longer-term projections provide insights into possible structural changes in

⁸ See Janssen (2002) for a further discussion about the inter-temporal finite horizon budget gap indicator.

⁹ The Long-Term Fiscal Model is made available online following the publication of each Treasury Statement on the Long-Term Fiscal Position: <http://www.treasury.govt.nz/government/longterm/fiscalmodel>.

government expenditure and revenue over time in light of demographic ageing and other pressures. As a baseline what we present in this paper are projections from the Treasury's long-term fiscal model. These projections assume that government expenditure grows according to historical growth pressures. We will refer to this throughout the paper as the *cost pressure scenario*.¹⁰ This scenario could also be interpreted as a "current policy" scenario which tries to capture policy as reflected in legislation or the history of decisions governments have made.¹¹

The main assumptions in the *cost pressure scenario* are¹²:

- (i) The economic projections begin after the end of the Treasury's five-year economic and fiscal forecasts.
- (ii) It is assumed the government implements its announced strategy for future operating allowances (in other words, government spending other than that on welfare entitlements and interest costs) during its current electoral term (for the three years following the last General Election). That is, the cost pressure, or "bottom up" expenditure projections are assumed to begin after that point (from 2015/16 onwards).¹³
- (iii) Economic output is determined by: population, labour force, and labour force participation projections (central projections from Statistics New Zealand), and an assumed number of average weekly hours worked (currently 33.2 hours per week), unemployment rate (4.5%), and economy-wide labour productivity growth (1.5% per annum).¹⁴
- (iv) Price inflation is 2% per annum (the mid-point of the target range in the RBNZ Policy Targets Agreement).
- (v) Nominal interest rate on government debt is assumed to move up gradually from the present 2.2% to 5.5% in 2021/22, remain at this level until 2026/27, and then climb to 6% from 2031/32.
- (vi) Nominal government expenditure (excluding transfer payments and debt servicing costs) grows with the sum of: inflation (assumed to be 2%), real input price growth (1.2%), public sector productivity growth (0.3%), demographic demand growth (growth in the relevant recipient population with cost weights applied), and non-demographic demand growth (based on historic trends in spending patterns, that might reflect the response of demand to higher incomes or the availability of new technologies).
- (vii) Spending on welfare benefits is projected to grow by the sum of the projected growth in the recipient population (as determined by current policy) and the price growth as determined by the particular indexation regime (for example, nominal wage growth for New Zealand Superannuation and a mix of the CPI growth and nominal wage growth for working-age benefits).

¹⁰ The Treasury refer to this approach in the 2013 Long-Term Fiscal Statement as the *resuming historic cost growth scenario*.

¹¹ The interpretation of current policy is important for projections. Auerbach and Gale (2011) present projections of US government debt under three interpretations of current policy. The implications for public debt are quite different under each interpretation.

¹² A fuller discussion of the reasons for adopting these assumptions is provided in Rodway (2013).

¹³ Previous Treasury Long-Term Fiscal Statements have assumed that the government's strategy for future operating allowances continues during the five-year forecast period. The change to this assumption is discussed further in Bell (2013). By contrast, the tax revenue projections in the LTFM begin after the end of the five-year forecast period, because that provides a more accurate view of the path of tax revenues.

¹⁴ This implies a future growth rate of real GDP per capita of 1.5% per annum over the projection period 2017-2060. This compares to an average real GDP per capita annual growth rate for New Zealand of 2.1% during the 1955-1974 period, 0.5% during the 1974-1992 period, and 1.8% during the 1992-2011 period (Carroll, 2012).

- (viii) Assets and non-debt liabilities of the government are assumed to grow in line with either nominal GDP, CPI-measured inflation or from generated tracks produced by satellite models such as the Government Superannuation Fund (GSF) Model.
- (ix) Government revenue is maintained at around 29% of GDP after the end of the forecast and transition period and/or once the average personal tax rate reaches its historical level, and
- (x) Core Crown gross debt is the residual of the model.¹⁵

Whether a government debt target is met is, therefore, determined by the level and growth of economic output, government revenue and expenditure decisions, as well as the government's cost of borrowing. These are the components of the expressions derived in section 2.1. The Treasury LTFM can therefore be viewed as an elaboration of the finite horizon inter-temporal budget constraint, which allows one to understand how population dynamics and other important influences impinge on the government's budget constraint over a period of time (in contrast to summary measures such as the inter-temporal fiscal gap). For example, demographic change influences the level and growth of economic output by influencing the size and growth of the labour force and labour force participation rates. It also influences spending on age-related government programmes such as education, New Zealand Superannuation and health services.

The LTFM can, therefore, be used to assess the sensitivity of fiscal projections to assumptions about labour force participation, migration, and so on. The IMF (2012a) has noted the tendency for projections of life expectancy for different countries to underestimate life spans consistently. Scenarios can be run using the LTFM to show the sensitivity of the projections to different life expectancy assumptions. It can also be used to assess the sensitivity of long-term fiscal projections to initial conditions, such as the likelihood of current governments maintaining their short-term fiscal programme. The approach for the 2013 Treasury statement is to assume that the current government implements its strategy for operating allowance-controlled expenditures (ie, expenditure on health, education, justice, etc., excluding welfare entitlements and interest costs) for the three years following the 2011 general election and to begin the expenditure projections for operating allowance-controlled expenditures, based on "bottom up" cost pressures, after that point.

The choice of when to begin the cost-pressure projections in these spending areas can be crucial to the time-profile of government debt. For example, beginning the fiscal projections for operating allowance-controlled expenditure three years after the last general election (in 2015/16), rather than after the five-year forecast period (in 2017/18), results in net debt being projected to increase to 200% of GDP by 2060, rather than 125% of GDP. This reflects the effect of compounding interest costs on government debt over time.

Bell and Rodway (2011) examine the reasons why the Treasury's net debt projections changed between 2009 and 2011. The net debt projections done in 2009 reached 223% of GDP by 2050, while those done in 2010 reached 106% of GDP by 2050 and those done in 2011 reached 44% of GDP by 2050. This change is largely explained by changes in the forecasts used for the initial five years of the projection period as a result of stronger taxation revenue growth arising from the improved economic outlook, and policy-induced government spending reductions. This comparison shows how important the medium-term fiscal projections can be for the time profile of the longer-term debt projections.

¹⁵ The cost pressure scenario therefore assumes that irrespective of the size of the projected future primary balance and level of debt, governments can always issue government debt to finance those deficits.

The treatment of taxation as well as some expenditure components in the Treasury LTFM (and many other long-term fiscal projection models) is fairly stylised. For instance, the 2009 version of the Treasury LTFM assumed that the proportion of public health expenditure that goes to each age group in the past will continue into the future. So for example, a 65-year-old in 20-years' time is assumed to demand the same proportion of health expenditure as a 65-year-old today, even though an average 65-year-old in the future is expected to be healthier on average than a 65-year-old today. In the 2013 Statement, the Treasury builds in assumptions of "healthy ageing" into its projections, where projected increases in life expectancy are assumed to delay the increases in public health expenditure accruing to different age groups.

Previous versions of Treasury's LTFM have assumed that tax revenue as a proportion of GDP is independent of the age structure of the population. This is consistent with the work of Creedy et al. (2010) that shows that population ageing is expected to influence the mix of taxation revenue more so than the level of taxation revenue.

As well as defining the path of fiscal aggregates based on the cost-pressure scenario, it is possible to derive the budgetary changes that would be required to stabilise debt at a particular level (such as a target debt level). This is referred to as the *sustainable-debt scenario*. A net debt limit of 20% of GDP is used in the 2013 Statement to show the fiscal adjustment that would be required to stabilise net debt at this ratio. The way government spending was restricted in this scenario is to set annual allowances for new operating spending that stabilise net debt at 20% of GDP and then allocate the operating allowances to the key spending areas, such as health and education. It is important to note that the Treasury's long-term fiscal statements do not recommend a particular long-term government debt target, as this will change over time for a number of reasons (this is discussed in the next section of this paper).

Scenarios can be run to show the sensitivity of the projections to different government debt targets, for example targets ranging from 0% to 30% of net government debt to GDP. Interestingly, within reasonable bounds the government debt target doesn't make a big difference to the fiscal adjustment that is required. This is illustrated by the fiscal gap calculations in section 4.7 of the paper. Other scenarios are of course possible. For example, the Fiscal Strategy Report (2011) assumes that top-down constraints on government expenditure (operating allowances) continue into the medium term.

3 Why does fiscal sustainability matter?

3.1 Fiscal sustainability and economic growth

The sustainability of the government's finances can influence economic conditions and performance in several ways. The sustainability of the government's fiscal position can influence the cost of capital and its ability to issue debt. If the government's fiscal position is seen as unsustainable, then it will be more likely to come up against borrowing constraints. It will also increase the likelihood of a higher country risk premium being added to the cost of borrowing faced by both the government and private agents.

While in principle one would expect perceptions of the sustainability of the government's fiscal position and the level of government debt to impact on economic growth, this relationship would not be expected to be straightforward and would depend on what is happening in other parts of the government's budget constraint. Barro (1979) and subsequent empirical work on fiscal policy and economic growth (see for example Kneller, et. al. 1999) would suggest that the composition of government expenditure and the composition of taxes will also influence economic growth. For example, increases in the level of government debt that are used to fund increases in public infrastructure may have a different impact on growth than debt used to fund welfare expenditures. Similarly, if increases in the level of government debt are assumed to be repaid by future increases in taxes, then the composition of tax increases could also influence future economic growth rates.

Sustainable fiscal policy can in principle also be important to anchor inflation expectations. As Sargent and Wallace (1985) have demonstrated, if it is believed the government is unlikely to be able to continue issuing government bonds to finance spending, then this may raise expectations that outstanding debt may be financed by increasing the money stock. If, as a consequence, there are expectations of increased inflation in the future, then that would lead to higher inflation in the present period. The significance of this mechanism for New Zealand is however not clear. Reinhart and Rogoff (2010) find that relationship between government debt and inflation varies between advanced and emerging countries. Although some advanced countries have experienced higher inflation when government debt is higher, they find no significant contemporaneous relationship between government debt and inflation for advanced countries. For emerging countries, on the other hand, they find inflation has tended to rise sharply when government debt rises. These differences might be attributable to differences in institutional arrangements, between advanced and emerging countries pertaining to monetary policy.

Sustainable government finances allow the government the flexibility to borrow in response to a temporary adverse shock to the government budget without needing to cut spending programmes or raise tax rates. This "smoothing" of tax rates over time minimises the cost of raising tax revenue. Having certainty around spending programmes also assists individuals to make investment decisions. For example, certainty around government infrastructure investment will assist individuals and firms to plan their own investment.

Low government debt allows fiscal policy to play more of a stabilising role during economic downturns and dampen, or at least not exacerbate, economic cycles. The deviation of demand and output from equilibrium can influence long-term GDP, if for example negative deviations have a permanent impact on the capital stock or investment in skills (Barker et al., 2008). A low level of government debt would provide more scope to allow "automatic

stabilisers,” such as unemployment benefits, to provide automatic fiscal expansion during downturns without requiring specific government policy decisions.

Having a sustainable fiscal position also allows the government more flexibility to use discretionary fiscal expansion during economic downturns. However, for a small, open country like New Zealand, the evidence is that discretionary fiscal policy tends to have only a small impact on aggregate demand, due to “leakage” to increased demand for imports, and the reaction of monetary policy (as discussed in Brook, 2013). Lags in the design and implementation of discretionary fiscal policy may also mean that the fiscal stimulus is not delivered when it is needed.

Perhaps unsurprisingly, a focus on fiscal sustainability will not ensure fiscal policy is stabilising during economic upturns. Experience has shown that there are significant challenges in managing fiscal policy through cycles. This is because of the political pressures to increase discretionary spending when the government is running large surpluses (especially when debt targets have already been met), and also because of the technical difficulties in determining whether budget surpluses are structural or cyclical. It may also be a challenge to communicate to the public that although operating surpluses may be large, owing to the revaluation of government assets, for example, cash surpluses may be a lot smaller. There are similar challenges for monetary policy, which has to distinguish supply and demand shocks and look through the cycle to estimate trend inflation. Brook (2013) considers options to make fiscal policy more stabilising during economic upturns, including revising the Public Finance Act so as to increase the importance that is placed on avoiding pro-cyclical fiscal policy; more focus on keeping to ex ante spending plans; or a stabilisation fund to safeguard revenue windfalls. The paper also touches on the potential role of an independent fiscal council.

In the New Zealand context, the government has let automatic stabilisers operate during the current economic downturn. Nevertheless, there have been periods of pro-cyclical discretionary fiscal policy. Fiscal impulse measures indicate fiscal policy was expansionary over the 2006-2008 upturn, and added to pressures on interest rate and exchange rate cycles and reduced output in the tradable sector (Brook, 2013). The 2006-2008 episode of pro-cyclical fiscal policy is one of the reasons why the PFA changes mentioned in the previous section were designed to place more emphasis on avoiding expansionary fiscal policy during economic upturns.

The preceding discussion suggests there is unlikely to be a simple rule for identifying the optimal level of government debt. This is because the impact of the level of government debt on economic growth is likely to depend on what that debt is financing, institutional arrangements for managing fiscal and monetary policy, on countries vulnerability to shocks, and the way countries and their government fiscal positions react to those shocks. While efforts have been made to identify threshold levels of government debt, some of that literature has been subject to a number of criticisms.¹⁶ Moreover, the appropriate levels of government debt may differ depending on international financial market conditions.

¹⁶ Some of this literature is summarised by Sutherland et. al. (2012) and their summary of the literature at that time suggested a threshold of 75% gross debt to GDP beyond which government debt has a negative effect on economic growth. However, that summary drew on literature, including Reinhart and Rogoff (2010), that has been called into question either because of concern with how the data was compiled (see for example Herndon et. al., 2013) or because of uncertainty about the direction of causality (see, for example, Dube, 2013). We would add also that this literature does not take into account the composition of other parts of the government's budget constraint (such as the composition of taxation and revenue), that would be expected to impact on the relationship between debt and growth.

Lane (2013) maintains that the appropriate target government debt ratio may be lower than was thought prior to the GFC because of lessons from the GFC about how quickly government debt can climb as the result of financial crises. Lane argues that maintaining low government debt is especially important for countries with substantial external liabilities (such as New Zealand).

Although since the GFC New Zealand government net debt has increased from less than 10% of GDP to over 30%, it is still relatively low compared to a number of other developed countries (IMF, 2012b). However, other countries, such as Australia, have lower levels of government debt than New Zealand, on both a gross and net basis. The current prudent level of government debt for New Zealand is also likely to be lower than for other developed countries because of New Zealand's relatively high levels of household and business debt (and conversely, households and businesses may be comfortable holding higher levels of debt, given the relatively low levels of government debt).

3.2 Fiscal sustainability and inter-generational equity

From an inter-generational perspective, government debt can be seen as an obligation passed from one generation of taxpayers to the next. The government's inter-temporal budget constraint, shown in expression (3), illustrates that for any terminal debt target a higher level of debt now will mean either higher taxation, or reduced government expenditure for future generations. Therefore, in the absence of offsetting behaviour by private agents, a higher level of government debt may imply a greater obligation passed from current to future generations (Auerbach, 2008). However, this analysis is complicated by several factors.

If each generation was to take the well-being of future generations fully into account in their saving and bequest decisions, the level of government debt would not have an impact on intergenerational equity as private savings and bequests would be fully adjusted to offset changes in government debt. Also, if future generations benefit from current government expenditure (eg, expenditure on long-lived assets such as infrastructure, or productivity-enhancing spending on education and skill development), then one might expect them to help fund it. Aiming to fund all such expenditure out of current taxation would in essence force current generations of taxpayers to subsidise government expenditure that benefits future taxpayers. Government debt allows those costs to be shifted to the generations of taxpayers that will benefit from the expenditure.

Another aspect to bear in mind is that the optimal level of government debt across generations cannot be assessed on the basis of economic analysis alone, as it also involves value judgements about how to weigh up the welfare of different individuals over time (Auerbach, 2008). If governments over time have an objective of ensuring a more equal distribution of resources between generations, then, if incomes are increasing over time, there may be a case to transfer resources from the young to the old. Increasing government debt may be one way of doing that. However, if the old are seen as being able to get less utility out of any unit of consumption as compared to the young, then that might suggest that fewer resources should be transferred to the old than is needed to equalise welfare across age groups (McDonald, 2005).

The Treasury has extended previous work undertaken on how taxation payments, government transfers and certain forms of government expenditure are distributed by income decile (Aziz et al., 2012) to show this breakdown by age, how it has changed through time, and how it may change in the future. Other forms of inter-generational analysis, such as the work by Coleman (2011) can also provide information to the government and the public about the nature and extent of generational transfers associated with particular fiscal programmes, such as NZS. Guest (2012) develops an overlapping generations model using New Zealand data to show the implications of tax smoothing (that is, increasing average tax rates in the short term and reducing them in the long-term) on different age groups. This work is being developed for application to the New Zealand data. These various studies will help inform governments of the intergenerational distributional implications of alternative fiscal adjustment options available to ensure fiscal policy programmes are financially sustainable.

4 New Zealand's fiscal framework

4.1 Public Finance Act 1989 requirements

The Public Finance Act (PFA) 1989 requires the government to manage total debt at prudent levels. The PFA also requires regular reporting to promote fiscal transparency through the disclosure of relevant fiscal information in a timely and systematic way.

Gross government debt in New Zealand briefly surpassed 70% of GDP in the 1980s. New Zealand's sovereign credit rating was downgraded from AAA to AA+ in 1983 and again to AA in 1986 and AA- in 1991 (NZDMO, 2012a). Since the early 1990s, reducing and maintaining prudent levels of government debt has been a goal pursued by successive New Zealand governments. This has been due to a greater acknowledgement of the importance of fiscal sustainability with this being formalised in the PFA as well as governments wanting to reduce the high costs of debt servicing. Wells (1987, 1996), Janssen (2001), Wilkinson (2004), Mears et al. (2010) and Brook (2013) discuss fiscal policy reform in New Zealand in more detail.

In terms of the government's IBC, the focus in the past was on ways to reduce debt servicing costs due to high debt and high interest costs (ie, high $(1+r)^{h+1}d_{n-1}$ in expression (4)), whereas the current debate around fiscal sustainability has tended to have a longer-term focus on potential future paths of government taxation and expenditure (ie, $t_s - g_s$). This is perhaps due to lower government debt levels and lower interest rates in the recent past and greater awareness of the potential effects of an ageing population. However, if the government's fiscal position is not well-managed, then debt servicing costs could again become a more acute issue.

The government's fiscal position generally improved after the 1980s until 2008. The level of government debt has risen in recent years as the result of fiscal policy decisions, New Zealand's domestic recession beginning in early 2008, the effects of the Global Financial Crisis (GFC), and the Canterbury earthquakes all impacting on tax revenue growth and government expenditure. The government's current fiscal position is less favourable now than it was when the first Long-Term Fiscal Statement was published in 2006.

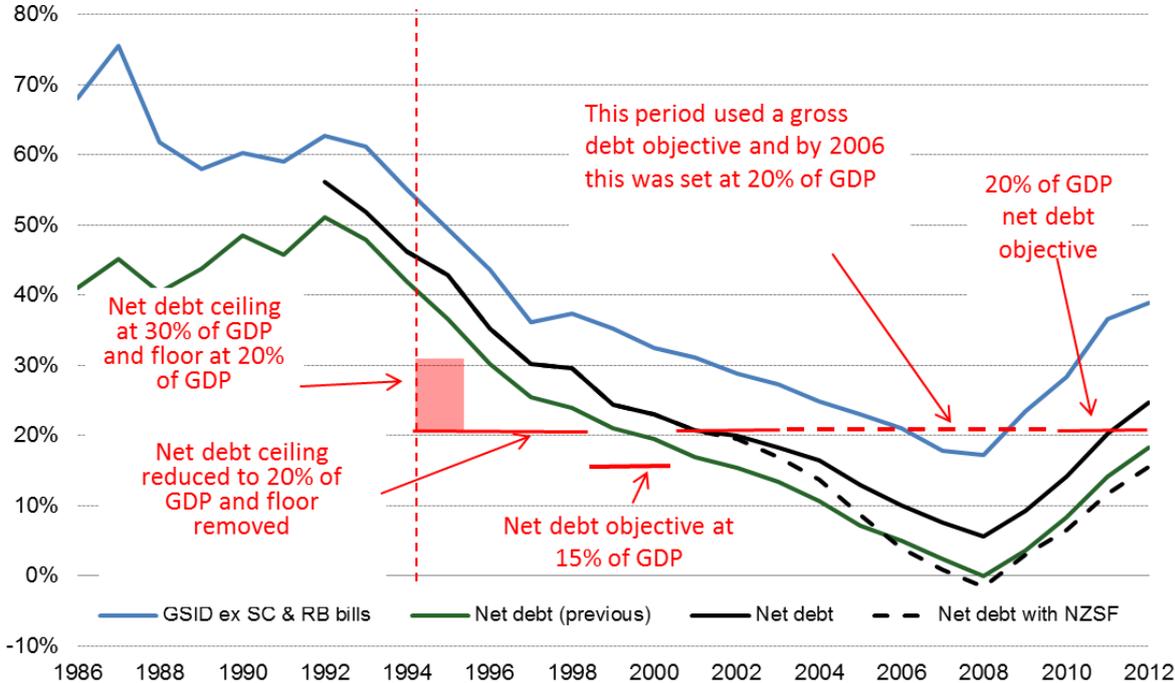
Figure 2 shows government debt ratios as well as some of the targets that governments have set for debt from 1986 to 2012. The current National-led government has a target to bring net debt down to no higher than 20% of GDP by 2020 (Fiscal Strategy Report, 2013).

The government debt target was changed from a gross to net debt target in 2009. The reasons for the switch from a gross to a net debt target in 2009 and the new gross and net debt definitions are explained in more detail in the Fiscal Strategy Report (2009). Gross government debt is currently defined as debt issued by the government, less settlement cash and bills issued by the Reserve Bank. Net debt is defined as gross debt less government financial assets (excluding New Zealand Superannuation Fund assets and advances). New Zealand Superannuation Fund assets are not included as financial assets for the purpose of this measure because NZSF assets are held for specific policy reasons.¹⁷ Advances, which include student loans, are also not included as financial assets because

¹⁷ The calculation of NZSF contributions is determined by a formula specified in legislation, which relates to a rolling average of projected NZS payments. NZSF contributions increase government borrowing, increase NZSF financial assets, and all else equal increase net debt (as the current net debt measure excludes NZSF financial assets). NZSF drawdowns have a symmetric effect on fiscal aggregates.

they are substantially less liquid than other government financial assets and are not held for purposes associated with government finances (Fiscal Strategy Report, 2009).

Figure 2: Government debt ratios and debt objectives, 1986-2012



Notes: (1) The life of each debt objective is approximate as objectives sometimes changed in Budget Policy Statements. (2) GSID = Gross sovereign issued debt; SC = Reserve Bank settlement cash; RB = Reserve Bank bills. (3) The net debt indicator excludes advances, such as student loans as well as NZ Superannuation Fund (NZSF) assets; advances were excluded from the net debt measure from Budget 2009 onwards. (4) The net debt indicator is not available prior to 1992 because data about advances is not available.

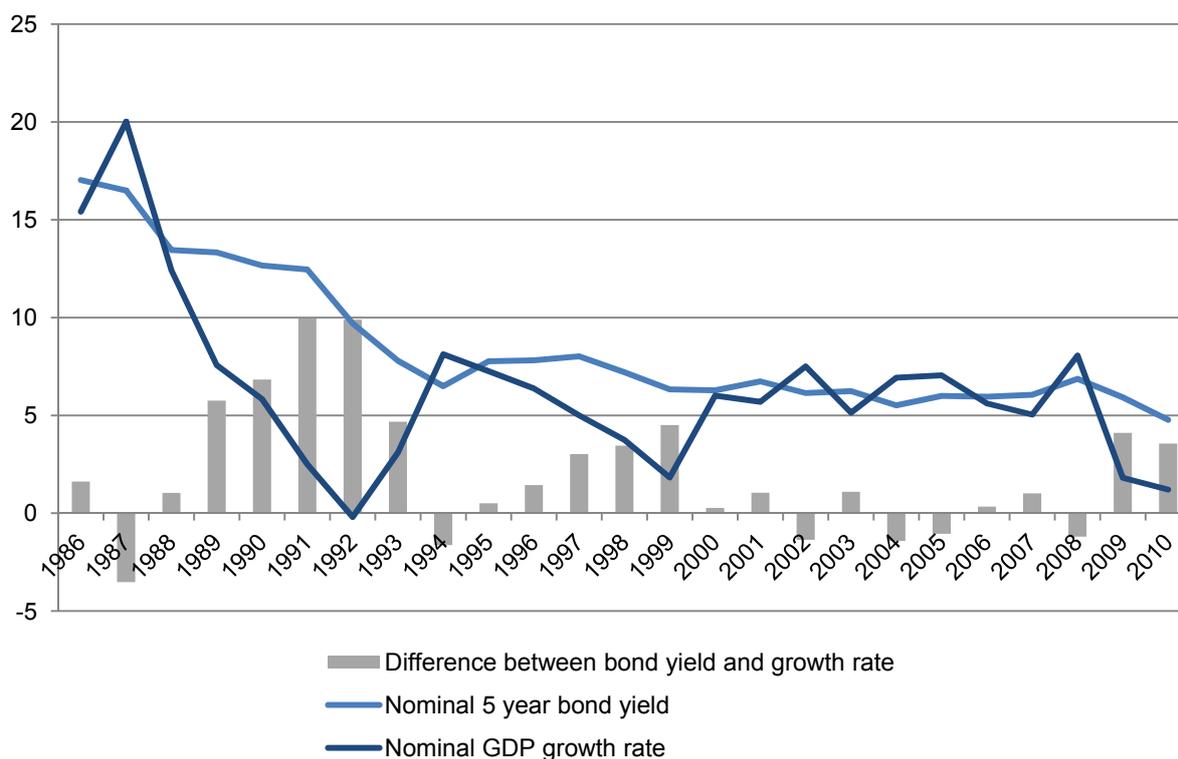
Of interest when examining the evolution of government debt is the relationship between the nominal interest rate and growth rate of output. Expression (4) shows that if the nominal interest rate exceeds the growth rate of output ($i > y$), then to stabilise the debt ratio the government must be running a primary surplus; if $i < y$ in the future then to stabilise the debt ratio the government debt can run a small primary deficit; and if $i = y$ in the future then to stabilise the debt ratio the government accounts must be in primary balance.

Figure 3 shows how the government’s cost of borrowing has compared to the economic growth rate in New Zealand since the mid-1980s. The government’s cost of borrowing is approximated by the average annual five year government bond yield. A more comprehensive measure would take into account the composition of the government’s borrowing portfolio and the yields on its different components.

The government’s nominal cost of borrowing has generally been above the economic growth rate since the mid-1980s, although less so during the 2000s. This is broadly consistent with recent experience of most developed countries (Escolano, 2010). The difference between the cost of borrowing and the economic growth rate has decreased on average since the 1990s. This could be at least in part due to the reduction in government debt as a proportion of GDP over this period (shown in Figure 3) as well as the reduction of general price inflation.¹⁸

¹⁸ Refer to Labushchagne *et al.* (2010) and Burnside (2012) for an analysis of why New Zealand has tended to have high real interest rates relative to other Organisation for Economic Cooperation and Development (OECD) countries.

Figure 3: Government cost of borrowing and economic growth, 1986-2010 (%)



Source: Statistics New Zealand, Infoshare; Reserve Bank of New Zealand

Notes: The 5 year bond yield is defined as the average annual 5 year bond yield. The nominal GDP growth rate is the annual average change in the production GDP measure, in current prices, seasonally adjusted; data are for March years.

To reduce debt (as New Zealand governments have tended to do since the mid-1980s) the government would have had to run larger primary surpluses than would have been necessary to stabilise debt. If this trend of $i > y$ continues into the future then this would tend to suggest that governments will have to be running primary surpluses to reduce and stabilise debt. Moreover, if in the future public debt rises due to the effect of population ageing and rising health costs, for instance, this gap could increase again. If higher debt reduces economic growth, and if higher debt leads to higher interest rates, then the gap between interest rates and economic growth rates would increase again, thereby accentuating the challenge of achieving fiscal sustainability.

4.2 Alternative fiscal anchors

Many governments around the world target debt as an anchor for fiscal policy. However, debt is not the only possible target. Governments may also choose to target some measure of the fiscal balance (such as a maximum deficit-to-GDP ratio) or the components of the government's inter-temporal budget constraint, such as tax or expenditure.

A debt targeting approach focuses attention on ensuring debt is kept at prudent levels, while giving discretion around the composition of tax and expenditure (referred to in Barker et. al. (2008) as "fiscal structure"). Government debt as an anchor of fiscal policy has one advantage over other potential fiscal anchors, such as tax or spending anchors, because it does not take a view on the optimal size and role of government. Or put another way, a debt anchor provides governments with a high degree of flexibility about the level and mix of spending and taxation while also satisfying their debt target.

Debt targets have been criticised for providing weak disciplines on government spending prioritisation especially during periods of strong revenue growth. Some countries have introduced spending limits to provide greater discipline to government spending decisions. Spending limits generally involve limits on total, primary or current spending, either in absolute terms, growth rates or as a share of GDP (Mears et. al., 2010).

Hong Kong has a general principle that over time the growth rate of government expenditure should not exceed that of the economy (ie, an expenditure-to-GDP limit). Sweden introduced a spending cap in 1997, and the cap is decided each year by Parliament on a rolling three yearly basis. The spending cap supplements the budget balance rule, which requires the government to run a budget surplus of 1% of GDP over the economic cycle. A surplus target was chosen to help avoid pro-cyclicality of fiscal policy and to pre-fund some of the costs associated with population ageing (Sweden Ministry of Finance, 2012).

Other jurisdictions have had more stringent spending and taxation limits. The state of Colorado in the United States amended its constitution in 1992 to limit per capita spending to the rate of inflation and decrease the amount of revenue the state could keep and spend if revenue fell during a recession. The Colorado spending limit can only be changed by voters. The Colorado experience is that the spending limit, combined with other constitutional provisions that required the government to increase spending in some areas, such as education and transportation, meant the government was required to make sharp cuts to expenditure in other areas. Voters in the 2000s have approved increases in the spending limit to allow greater spending in certain areas, such as education and transport (Wilkinson, 2004).

The 2008 Treasury Briefing to the Incoming Government recommended New Zealand governments adopt an additional fiscal anchor in the form of a medium term expenditure or revenue constraint as a share of GDP. The OECD (2009a) have also recommended New Zealand consider a spending cap. Mears et. al. (2010) put forward a possible spending cap designed for New Zealand. The proposed spending cap would be a nominal dollar figure for core Crown expenses (excluding unemployment benefits, debt financing costs, re-measurements losses and debt impairment). The cap would be set for three years with the third year updated annually on a rolling basis. It would be set by the government and not bind future governments. At that time the government decided not to introduce a spending cap, because while it was thought to have some benefits, its complexity in particular presented some risks.

The 2011 Confidence and Supply agreement between the National and ACT parties in New Zealand includes an agreement to introduce a legislative spending limit to “better constrain excessive future increases in government spending”¹⁹. The spending limit restricts expenditure (core Crown operating expenditure, excluding finance costs, unemployment benefits, asset impairments and spending on natural disasters) to grow no faster than the rate of population growth and inflation. Given that nominal per capita GDP has tended to grow more quickly than prices, if left unadjusted, such a spending limit would see government spending decrease as a proportion of the economy over time.

The PFA, while specifying debt as the primary fiscal anchor also requires the government to set fiscal intentions and fiscal objectives for a wider set of fiscal aggregates, including revenues, expenses, the operating balance, and net worth). The National-led Government has introduced the Public Finance (Fiscal Responsibility) Amendment Bill, which would

¹⁹ A confidence and supply agreement is an agreement that a minor political party or independent Member of Parliament will support the government in motions of confidence and appropriation (supply) votes by voting in favour or abstaining.

amend the fiscal responsibility provisions of the PFA to extend them beyond their current focus on achieving and maintaining prudent levels of government debt. The proposed changes will require governments to:

- (i) Have regard to the interaction between fiscal policy and monetary policy
- (ii) Ensure that the Crown's resources are managed effectively and efficiently;
- (iii) Have regard to the likely impact of fiscal policy on present and future generations; and
- (iv) Report on the extent to which the Government has kept to its fiscal strategy.

These changes reflect the fact that the PFA has been very successful in focusing governments on reducing debt, but less so in taking into account the impact of fiscal policy on the economic cycle, and in particular the monetary policy response that fiscal policy decisions can sometimes lead to. The requirement to take into account impacts on future generations provides a link in the fiscal responsibility provisions to the requirement in the PFA for the Treasury to produce four-yearly statements on the long-term (40+ year) fiscal position.

4.3 Considerations when setting debt targets

There is no simple rule for governments to follow to determine a prudent level of government debt, or for setting upper and lower bounds to recognise the uncertain environment in which fiscal policy is operated. But there are several issues that should be brought to bear on decisions about a debt target. These include the size of the fiscal buffer needed to respond to economic shocks; the implications of government debt for the risk premium on borrowing; and the role of debt in funding capital expenditure. Debt targets should also take into account expected future spending pressures, such as those resulting from population ageing, which may warrant the accumulation of financial assets or a reduction of net debt to pre-fund some of these expected expenditure increases.

Fiscal buffers allow governments to continue to fund expenditure programmes during economic downturns through borrowing and/or selling financial assets rather than by increasing taxes. This allows “tax-smoothing” over time. Fiscal buffers are also beneficial from a fiscal stabilisation point-of-view as they avoid the need for governments to raise taxes to fund expenditure during economic downturns.

Consideration of the appropriate fiscal buffer should also take into account the wider set of vulnerabilities facing the economy, including contingent liabilities, such as explicit or implicit guarantees of the financial sector, the risk and likely impact of natural disaster events, exposure to terms of trade fluctuations, as well as the level of private sector debt. A number of these vulnerabilities, and particularly New Zealand's high level of external indebtedness, has been mentioned as a weakness in recent sovereign credit rating assessments of New Zealand. This is reflected in the following excerpts:

“NZ's household saving rate, though improving, remains negative. NZ's national savings/investment imbalance is the key structural weakness”. (Fitch, 2011)

“... These strengths are moderated by New Zealand's very high external imbalances, which are accompanied by high household and agriculture sector debt, dependence on commodity income, and emerging fiscal pressures associated with its ageing population”. (Standard and Poor's, 2011)

The liquidity of the government's balance sheet is also an important factor, as this also influences the ability of the government's finances to withstand shocks. A more liquid balance sheet improves the ability of the government to meet liquidity demands if access to credit markets is restricted.

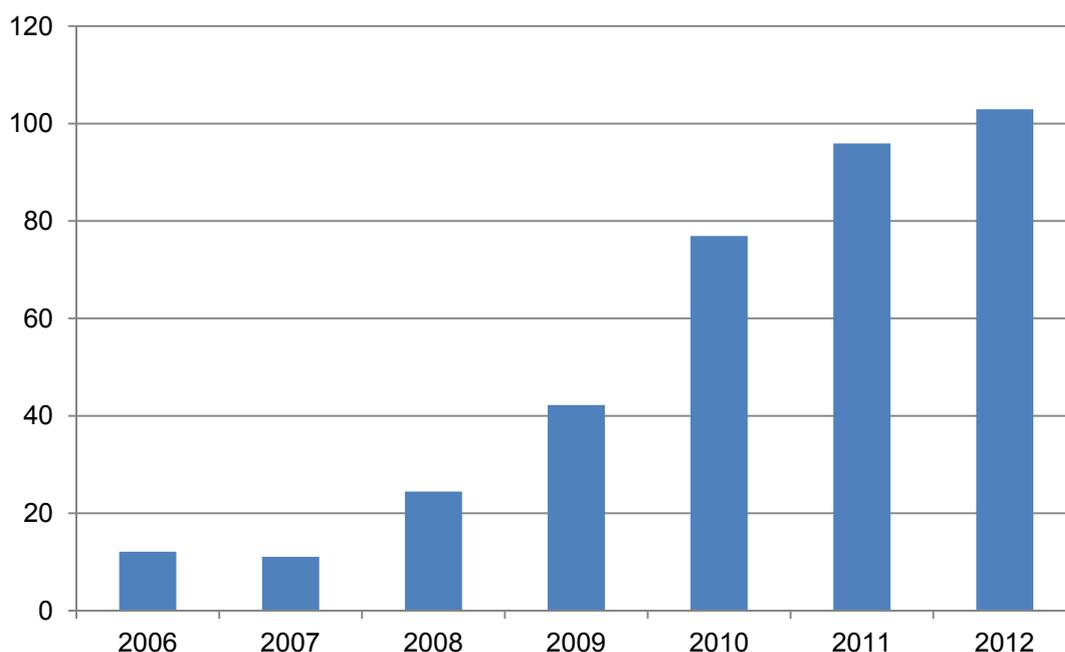
Other factors that are often cited as relevant for the riskiness of government borrowing, including the ability of the government to repay and refinance debt, are the currency the government borrows in, the term of the borrowing, and who holds the debt. The vast majority of New Zealand government debt is denominated in New Zealand dollars. This means that if the New Zealand economy is hit by an adverse shock and the New Zealand dollar depreciates the government is required to repay maturing debt and/or interest payments in New Zealand dollars rather than another currency (which would equate to a higher New Zealand dollar amount given the depreciation of the currency).

New Zealand government debt is predominately in the form of government bonds, rather than Treasury bills. Government bonds have a maturity of greater than a year and pay fixed interest payments to the investor. Treasury bills have a maturity of less than a year and rather than paying a fixed interest payment to the investor, provide a return to the investor through an appreciation in the price of the bill. As at 30 September 2012, the government had approximately \$63 billion of government bonds on issue, and \$8 billion of Treasury bills. The New Zealand Debt Management Office (NZDMO) provides data on the maturity profile of outstanding debt. The average maturity of government bonds was around five and a half years, and for Treasury bills was around six months (NZDMO, 2012b).

Approximately 67% of government bonds are held by non-residents and 33% domestically (as at 31 May 2013). The proportion of debt held by non-residents is above average compared to other OECD countries but less than Australia. Given the tendency of "home bias" in investment decisions, refinancing risk is generally considered to be lower the more government debt is held domestically. The proportion of government debt held domestically has increased in recent years. This has been attributed, in part, to a greater demand for government bonds from commercial banks as a result of the Reserve Bank of New Zealand's prudential requirements, which require commercial banks to hold a greater proportion of liquid assets, such as government securities (see Hoskin, et. al., 2009).

Ireland provides an example of how rapidly government debt can increase as the result of economic and financial shocks. General net government debt in Ireland increased from around 11% of GDP in 2007 to over 100% of GDP in 2012. This is shown in Figure 4. This case study not only provides lessons about government fiscal management, but also broader policy settings, such as the monetary and exchange rate policy and prudential policy, and how the government controls contingent and implicit liabilities.

Figure 4: General government net debt, Ireland, 2006-2012 (% GDP)



Source: IMF (2012b) World Economic Outlook database, 2012

In the New Zealand context, the government introduced the Retail Deposit Guarantee Scheme (DGS) and Wholesale Funding Guarantee Facility (WFGF) for financial institutions in late 2008 in response to the international financial market turbulence. These schemes increased the contingent liabilities of the government. The New Zealand government had approximately \$124 billion of guaranteed retail deposits and \$6 billion of funding guaranteed through the WFGF in October 2009 (New Zealand Government, 2009). This compared to net debt at the time of around \$17 billion. The DGS, and subsequent extension of the scheme have now ended, and the WFGF has around \$3.4 billion of funding still under guarantee (as at 31 May 2013). Payments to depositors in failed financial institutions protected by the DGS totalled just over \$2 billion and recoveries from those receiverships totalled just over \$1 billion resulting in a cost the government around \$1 billion. Participating entities in both schemes paid fees for the guarantees provided which totalled just under \$0.5 billion.

Recent OECD and IMF work has highlighted the extent and implications of implicit guarantees of the financial sector for sovereign risk management and the functioning of financial markets (see for example, Schich et. al., 2011; and Ötoker-Robe et. al., 2011). Internationally, changes to the regulation, supervision and resolution regimes for financial institutions are motivated by a desire to address some of these issues. In New Zealand the Reserve Bank of New Zealand (RBNZ) has introduced new liquidity requirements for banks and has proposed adopting the new Basel III capital requirements which are intended to increase the resilience of commercial banks to future financial shocks. The development of the Open Bank Resolution (OBR) tool has been motivated by a desire to provide an option other than liquidation or a government bailout to resolve a bank distress situation, where a private sector solution is not immediately available (RBNZ, 2012).

Fookes (2011) has attempted to assess the appropriate fiscal buffer for New Zealand by analysing the impact of fiscal and economic shocks on the government's fiscal position using shocks that have occurred in countries with similar characteristics to New Zealand (ie, countries with high external indebtedness and relatively low government debt). He examines the implications of two scenarios: an earthquake and an economic shock of the magnitude

that hit Ireland and Spain during the Global Financial Crisis. The analysis concludes that compared with previous fiscal consolidations, the earthquake scenario is considered manageable, whereas the most severe scenario based on the economic and financial shock that hit Ireland over the 2008 to 2010 period is considered just manageable, assuming uninterrupted access to government debt funding markets. This work shows that having a starting level of net debt below 20% of GDP is an important condition for ensuring these shocks would be manageable.

An alternative methodology could be to take a stochastic approach by examining the probability and impact of a range of shocks to the fiscal position, based on historical information. This information could be used to examine the desirable level of government debt. As far as we are aware, such an approach has not been taken to examine the future stock of government debt in the New Zealand context, although stochastic approaches have been used to assess elements that impact on the long-term fiscal position, such as budget balance and population projections. For instance Buckle et. al. (2002) uses a structural vector autoregressive (SVAR) model to examine the impact of different shocks to the government's short-term budget balance. One of the insights from this paper is that even for short future time spans, projections of the budget balances in the New Zealand context involve a high degree of uncertainty which underscores the importance of a debt buffer. Stochastic approaches have also been applied to population projections in New Zealand (see Creedy and Scobie, 2002; Dunstan, 2011).

Stochastic approaches have not tended to be used in the Treasury's long-term fiscal modelling in the past because over long time periods there is so much variability around demographic, economic and fiscal variables that this approach would generate extremely large confidence intervals. The results in Buckle et. al. (2002) illustrate that even increasing the time horizon out from one to five years (let alone forty years) has a big impact on the confidence interval around the estimates. While the uncertainty of the future fiscal position is an important communications message, and may inform decisions about whether to act now, or delay and act later once more information is available, large probability distributions may provide a justification for inaction. The OECD (2009b) point out that while sensitivity analysis can be used to highlight the uncertainty that projections are subject to, too much sensitivity analysis can over-emphasise uncertainty and undermine the impact of projections (presumably encouraging delay in taking difficult decisions). Another consideration that will have implications for the timing of fiscal adjustment is the expected costs and benefits of bringing fiscal adjustment forward to reduce potential future fiscal costs or risks versus the benefits of additional information that can become available from delaying adjustment. This is discussed further in section 5 of the paper.

The potential for high levels of public debt to "crowd out" private investment is another factor to consider in setting a public debt target. Increasing government debt may be costly if large injections of debt-financed government spending crowd out private sector spending by driving up the real interest rate and real exchange rate. Hall et. al. (1998) develops a small open economy model which shows the impact of the fiscal balance on the interest rate premium. The scenario of a rise in the debt-to-GDP ratio of 2% over a two year period is found to be initially expansionary, but then neutral over the long term. The expansion comes from increased consumption and investment expenditure. The crowding out of private sector expenditure, including investment, is less than full. Key transmission mechanisms are the interest rate risk premia and real interest rates and an appreciation of the exchange rate. Baumol (1967) suggests that crowding out of private sector investment will be costly to the economy as a whole if the government is less productive than the private sector. High levels

of government debt may also be costly for the economy if government debt pushes up the risk premium on borrowing for private individuals as well as the government.

Another consideration when setting debt targets is that governments may want to borrow to fund capital investment rather than fund investment through current taxation. Raising debt may allow governments to fund potentially growth-enhancing investments more efficiently than through raising taxes. This is the basis of the “golden rule of public finance” which states that the government will borrow only to invest and not to fund current spending. If specified over the economic cycle then this would mean that the government budget (excluding investment) must balance or be in surplus. This rule has been formalised in legislation in some countries. The golden rule was one of several fiscal principles set out in the United Kingdom’s 1998 Public Finance Act. The rule was subsequently abandoned in 2009. The golden rule may be considered less transparent than a debt target, as it depends on where the economy is in the economic cycle. There are elements of the golden rule reflected in the New Zealand PFA, including that government needs to run small budget surpluses on average over time.

It may also be desirable to pre-fund government expenditure associated with population ageing. This may be justified on efficiency or on equity grounds. It may be more efficient for governments to pre-fund New Zealand Superannuation (NZS) for example, as long as the returns to investing in capital are higher than the growth in wages (see Coleman, 2011). It may also be more equitable to tax current generations to fund their future entitlements. However, in moving to more pre-funding there is always the issue of the transitional generation that needs to pay twice by continuing to fund entitlements of the current elderly, as well as pre-funding its own entitlements. This has both efficiency and equity implications. There are opportunity costs associated with pre-funding entitlements (eg, not being able to reduce taxes or increase expenditure in other areas now) and there may be governance costs associated with some pre-funding options (eg, establishing and running a superannuation fund).

Most of the above discussion has concerned setting upper limits for net or gross government debt. When considering whether there is a minimum level of gross debt that governments should hold, some considerations will include the benefits of maintaining a liquid market for government bonds, as well as the role of debt in funding capital expenditure, especially for long-lived assets (discussed above). Reinhart et. al. (2000) examines the economic implications of declining government debt in the United States. The paper suggests that if one of the reasons market participants buy US Treasury Bonds is because of their liquidity, reduced liquidity could result in the emergence of a new benchmark financial product with greater liquidity. As a result, the liquidity premium that market participants are willing to pay for Treasury bonds could be reduced. The Australian government established a “Future Fund” in 2006 to invest government budget surpluses, rather than using the surpluses to repay government debt. One of the motivations for this was that the government wanted to maintain a market for government bonds (Emmerson et. al., 2006).

In terms of the path to get to the chosen debt target the implications of fiscal adjustment on short-term growth will also need to be taken into account. Research into the growth effects of components of government expenditure and taxes suggest that the growth effects of changes in fiscal policy vary by the types of taxes and types of government spending. If for instance, the government had to reduce some investment due to it breaching its debt targets then that could, depending on the quality of the investment, have adverse long-run growth implications (see for instance Kneller et. al., 1999). Also, while New Zealand is thought to have small fiscal multipliers as a small open economy, fiscal consolidation is likely to have some short-term growth effects. It will also impact differently on different sectors of the economy.

Most of the above discussion has been about how government debt can be used as a mechanism to manage volatile revenues and provide a buffer to respond to economic shocks. However, there are other mechanisms, such as stabilisation funds, that can also be used in conjunction with debt to achieve these objectives. Stabilisation funds are designed to save temporary increases in government revenue (such as those from temporarily high terms of trade) in order to finance deficits in later years. For a discussion of stabilisation funds in the New Zealand context, see Brook (2013).

4.4 New Zealand's long-term fiscal outlook

So far in this paper we have argued that, based on the insights from theoretical research and country experiences, high levels of government debt and expectations that government fiscal programmes will not be financially sustainable, can have significant adverse effects on economic growth and can impact on the intergenerational distribution of benefits and costs of government fiscal programmes. Although various fiscal anchors have been either proposed or applied in an effort to discipline governments, in New Zealand the Public Finance Act requires governments to manage debt at “prudent” levels. In recent years successive New Zealand governments have managed to keep the level of public debt well within what is regarded as critical levels. But, as we foreshadowed in the opening section of this paper, New Zealand is experiencing population ageing. This is a consequence of a structural change in our demographic make-up and is not a temporary phenomenon caused by the post-WWII baby boom. This demographic change has the potential to undermine the feasibility of ensuring the sustainability of current fiscal programmes and therefore undermine the ability of future governments to maintain the current configuration of fiscal programmes without breaching the principles of responsible fiscal management specified by the Public Finance Act.

We now turn to an example of what some of the fiscal sustainability measures outlined in Table 1 look like for New Zealand. This is done by showing simulations of the impact of population ageing, and other influences such as steadily rising real incomes, on future government budget balances and debt levels using the Treasury's Long-Term Fiscal Model. Longer-term projections can provide insights into possible structural changes in government expenditure and revenue over time in light of demographic ageing and other pressures. As we discussed earlier, this is a model that can provide more detail about the components that make up the finite horizon budget constraint and is used to provide projections of future paths for the components of the budget constraint, implications for government debt and the components of the fiscal sustainability measures outlined in Table 1. Each graph presented in this section can be split into three periods:

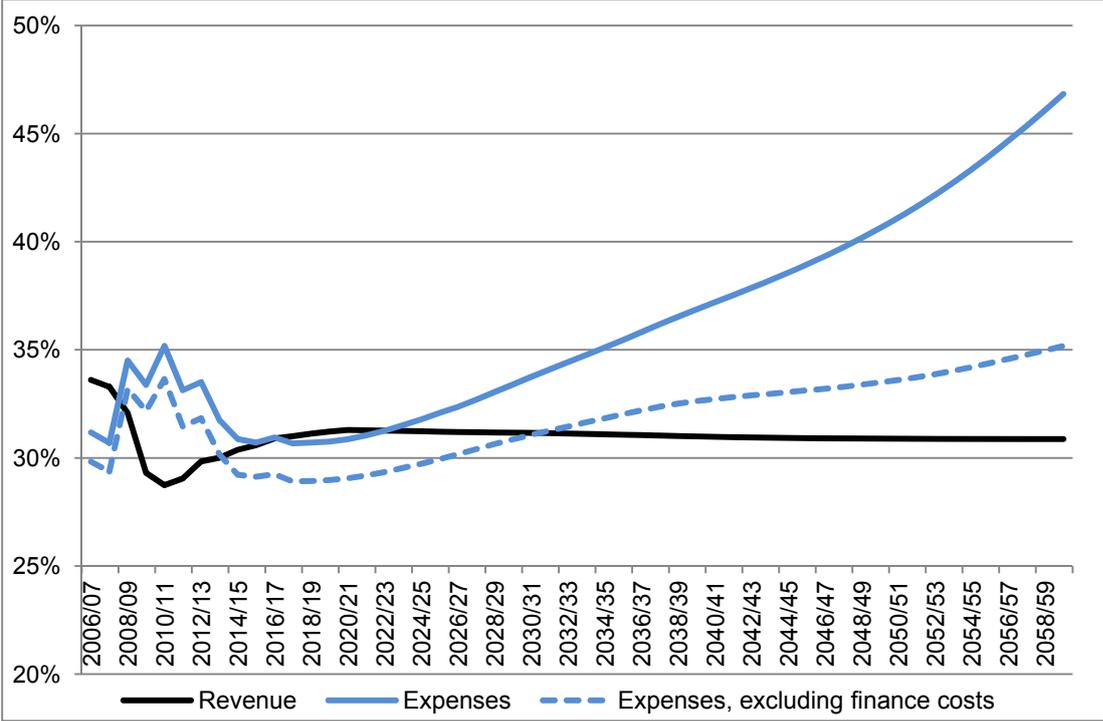
- (i) A historical period, 2007/08-2011/12 (based on historical data, reflected in the Crown accounts);
- (ii) A forecast period, 2012/13-2016/17 (based on forecasts from the New Zealand Treasury Model; for July to June years); and
- (iii) A projection period, 2017/18-2059/60 (based on projections from the Long-Term Fiscal Model).

As explained in Section 2.3, the projections for operating allowance-controlled government expenditure (eg, government spending not on welfare or interest payments, such as spending on health, education, justice and so on) based on cost pressures differ from this and begin in 2015/16, three years after the last General Election.

4.5 Projections of government revenue, expenditure, and budget balance measures

Figure 5 shows projections of government revenue and expenses (with and without debt financing costs) as a percentage of GDP. Government revenue as a percentage of GDP falls from 2007/08 to 2010/11 before rising again and then stabilising at around 31% of GDP. Government expenses as a percentage of GDP generally increased over the 2007/08-2010/11 period and fall in the period to 2016/17 (due, in large part, to restrictions on new operating allowances, which are assumed to hold until 2014/15) before increasing from 2017/18 as a result of “bottom up” expenditure pressures. The wedge between government expenses with and without finance costs shows the proportion of government expenditure that is attributable to interest on government borrowing. As gross debt begins increasing from the late 2010s interest costs become a larger share of government expenditure. Revenue exceeds expenditure from 2017/18 before permanently dropping below expenditure from 2023/24. The gap between government revenue and expenditure which opens up, illustrates that closing this gap by raising revenue will require continually increasing revenue (such as tax) as a proportion of GDP. Similarly, closing this gap by reducing expenditure would involve governments continually managing spending pressures over time.

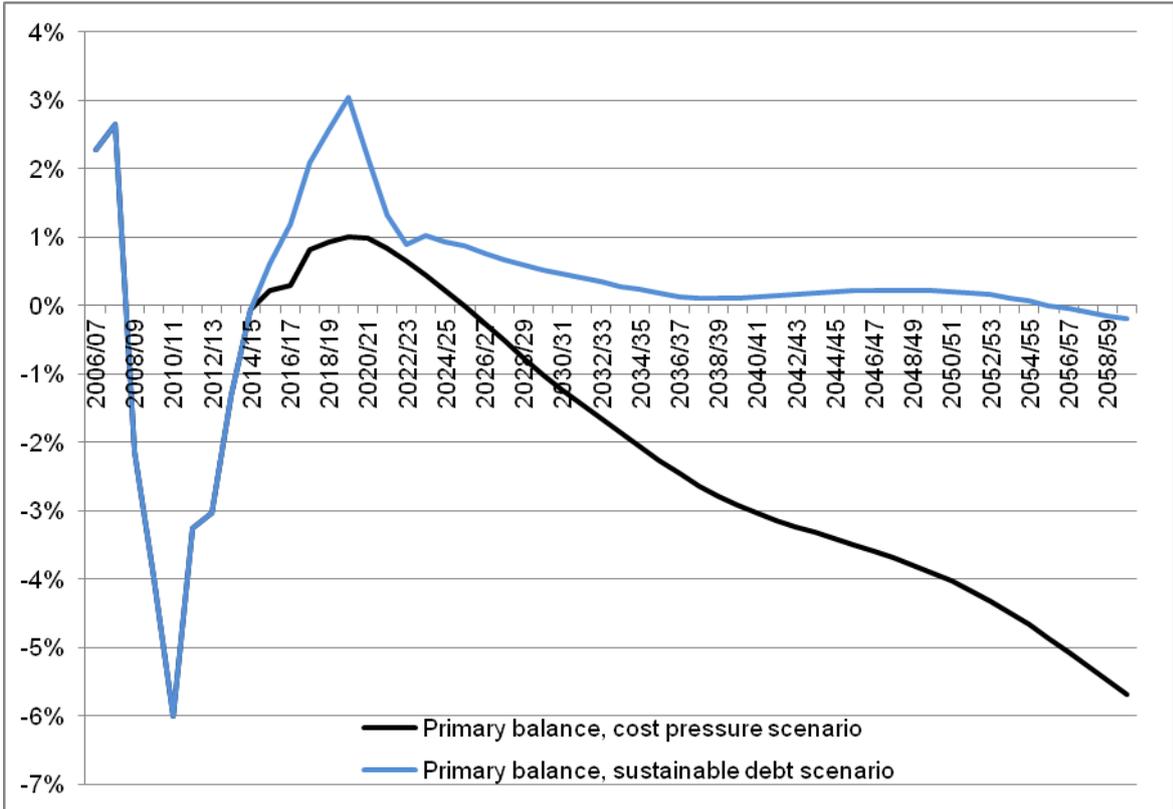
Figure 5: Government revenue and expenses as a percentage of GDP, 2006/07-2059/60



Notes: (1) revenue is the core Crown revenue excluding valuation gains; (2) expenses are core Crown expenses excluding losses; (3) expenses excluding finance costs are core Crown expenses excluding valuation losses and finance costs; (4) the projections are based on Budget 2013 forecasts

Figure 6 shows projections of the government’s annual primary balance as a percentage of GDP. Under the cost pressure scenario the primary balance will return to surplus in 2015/16 and then fall into deficit from the mid-2020s. In order to stabilise net debt at 20% of GDP the government would need to run small primary surpluses for most of the projection period.²⁰ The reason the government can run small primary deficits from 2056/57 and still stabilise debt is because of the income projected to be earned from financial assets. The government could limit the size of its primary deficits in order to stabilise debt by constraining government expenditure or raising revenue, or making a combination of expenditure and tax changes.

Figure 6: Primary balance as a percentage of GDP, 2006/07-2059/60



Notes: (1) the primary balance is the core Crown operating balance excluding valuation gains and losses, investment income and finance costs; (2) the projections are based on Budget 2013 forecasts; (3) the projections assumptions are summarised in section 2.3 of the paper; (4) for the purpose of the projections, the sustainable debt scenario assumes core Crown net debt to GDP, excluding the New Zealand Superannuation Fund and advances, is reduced to 20% and maintained at that level over the projection period.

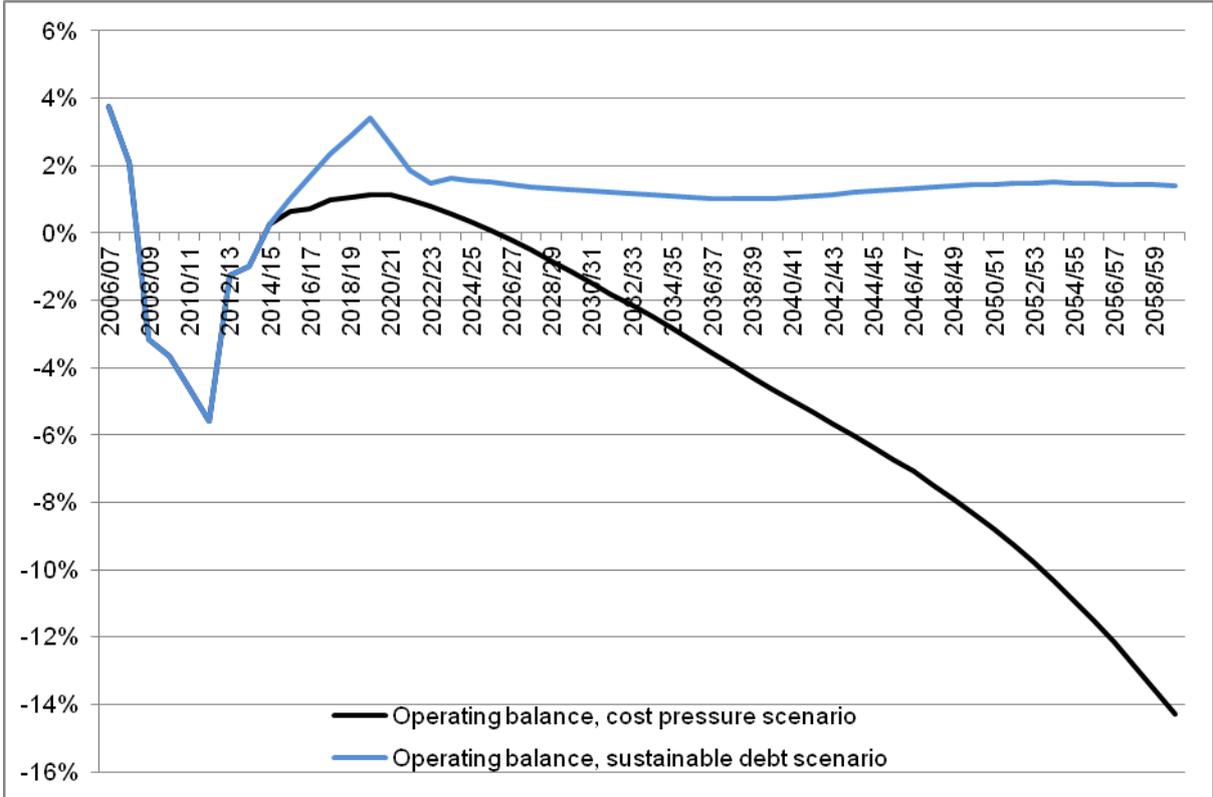
Figure 7 shows projections of the government’s annual operating balance as a percentage of GDP. Under the cost pressure scenario the operating balance will return to surplus in 2014/15 and fall back into deficit from the late 2020s. The Treasury’s projections show that in order to stabilise net debt at 20% of GDP, the government would need to sustain an operating surplus of 1 to 1.5% of GDP from the mid-2020s. Stabilising net debt at 20% of GDP requires the government to manage the “wedge” that arises between the cost pressure and sustainable debt scenarios, for example, by changing its tax or expenditure settings. A

²⁰ In the LTFM assumes $i > y$. According to (5) this would suggest that the primary balance would need to be positive in order for the government to stabilise debt. The apparent difference in results between (5) and the LTFM projections is because (5) only takes into account interest payments on debt, but unlike the LTFM does not take into account interest earned on financial assets, or unrealised valuation gains or losses on financial assets. Using the definition of primary balance in (5) we can replicate the result that where $i > y$ then the primary balance needs to be positive to stabilise debt. The other difference between (5) and the LTFM scenario examines what would be required to stabilise net debt, whereas (5) examines what would be required to stabilise gross debt.

significant portion of the gap represents the difference in debt financing costs between the two scenarios, and so if governments begin adjustments earlier, they avoid some of those costs eventuating.

The difference between the primary balance and operating balance under the 20% net debt scenario reflects that over the projection period, interest and unrealised valuation gains on financial assets exceed debt servicing costs and unrealised valuation losses on financial assets.²¹ This illustrates the financing consequences of simply allowing debt to grow to fund the consequences of population ageing and other future pressures on government spending. This in turn shows that delays in fiscal adjustment imply the possibility that much larger adjustments will be required in the future.

Figure 7: Operating balance as a percentage of GDP, 2006/07-2059/60



Notes: (1) The operating balance is the Core Crown revenue less expenses plus gains and losses from associates and joint ventures²²; (2) the projections are based on Budget 2013 forecasts; (3) for the purpose of the projections, the sustainable debt scenario assumes core Crown net debt to GDP, excluding the New Zealand Superannuation Fund and advances, is reduced to 20% and maintained at that level over the projection period.

²¹ In a simplified form, the operating balance = revenue – expenditure; and the primary balance = [revenue – (interest + valuation gains)] – [expenditure – (debt financing costs + valuation losses)]; so the operating balance exceeds the primary balance if (interest + valuation gains) > (debt servicing costs + valuation losses).

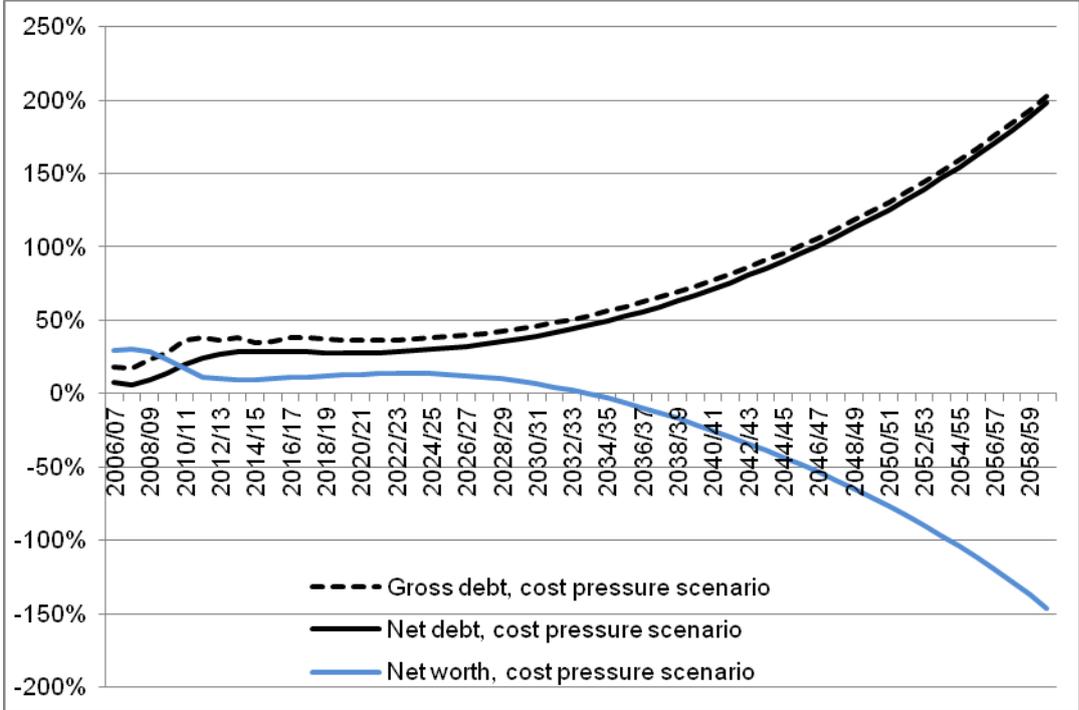
²² The Core Crown consists of Ministers of the Crown, departments, Offices of Parliament, the New Zealand Superannuation (NZS) Fund and the Reserve Bank of New Zealand. This is a narrower measure than the total Crown, which also includes State-Owned Enterprises, Crown Entitles and a variety of other organisations.

4.6 Projections of government debt

We now turn to the implications of these projections of the operating balance for projections of government debt. Figure 8 shows projections of the government’s gross debt, net debt and net worth as a percentage of GDP under the cost pressure scenario. Gross debt peaked at 39% of GDP in 2013/14 before reaching a trough of about 35% of GDP in the mid-2010s and generally increasing thereafter.

Net debt is government gross issued debt less government financial assets. This excludes advances and assets held in the New Zealand Superannuation Fund, which are held for a specific policy purpose (prefunding part of future NZS costs).²³ Net debt is projected to steadily increase over the projection period. Both gross debt and net debt reach similar levels by 2060 because financial assets (which exclude advances and NZ Superannuation Fund assets) are projected to be close to zero by 2060. Net worth reflects the assets and liabilities of the government. Assets and non-debt liabilities of the government are assumed to grow in line with either nominal GDP, CPI-measured inflation or from generated tracks produced by satellite models eg, the Government Superannuation Fund (GSF) Model. Net worth is projected to fall to just under 10% of GDP in 2013/14 before reaching a peak of just under 14% of GDP in the early 2020s and decreasing thereafter. We should stress that these projections out until 2060 for public debt and net worth are presented to illustrate the implications of government’s meeting bottom up expenditures pressures where there is no policy adjustment. History suggests however that either government makes adjustments to policies before government debt reaches these levels, or financial markets react in a way to force policy change.

Figure 8: Gross debt, net debt and net worth as a percentage of GDP, 2006/07-2059/60



Notes: (1) Gross debt is Core Crown Gross Sovereign Issued Debt excluding RBNZ settlement cash; (2) Net debt is Core Crown Net Debt excluding New Zealand Superannuation Fund and advances; (3) Net worth is Core Crown Net Worth; (4) the projections are based on Budget 2013 forecasts

²³ NZ Superannuation Fund financial assets are projected to reach approximately 30% of GDP by 2060, so if NZSF financial assets were included in the net debt measure then net government debt would reach approximately 170% of GDP by 2059/60 rather than 200% of GDP.

4.7 Fiscal gap measures

The previous sections endeavoured to show the time profile of operating balances, primary balances and government debt under certain assumptions. As we discussed in section 2, the outcome for fiscal aggregates can be summarised by the fiscal gap measure. The finite horizon fiscal gap is a single indicator that represents the extent of fiscal adjustment required at a point in time to meet a particular debt target in the future. The fiscal gap measure is described in expression (6) presented earlier in the paper. Table 2 shows fiscal gap calculations for New Zealand, generated for different terminal debt targets, if adjustment is made to the primary balance in 2017/18 in order to achieve the specified terminal public debt target. The measures are derived from projections generated from the Treasury Long-Term Fiscal Model. Based on the central assumptions in the LTFM, the permanent change in the primary balance in 2015/16 to reach a terminal debt target of 20% net government debt to GDP by 2059/60 is 2.2% of GDP.

The fiscal gap calculations show that within reasonable bounds, the terminal debt target does not make a big difference to the degree of fiscal adjustment that is required. This is because small changes made early can add up to significant reductions in debt servicing costs over long periods of time, and the bulk of the adjustment is to bring debt down from very high levels (eg, 200% of GDP), to something within a lower range (eg, 0% to 40% of GDP).

Table 2: Fiscal gap calculations for New Zealand

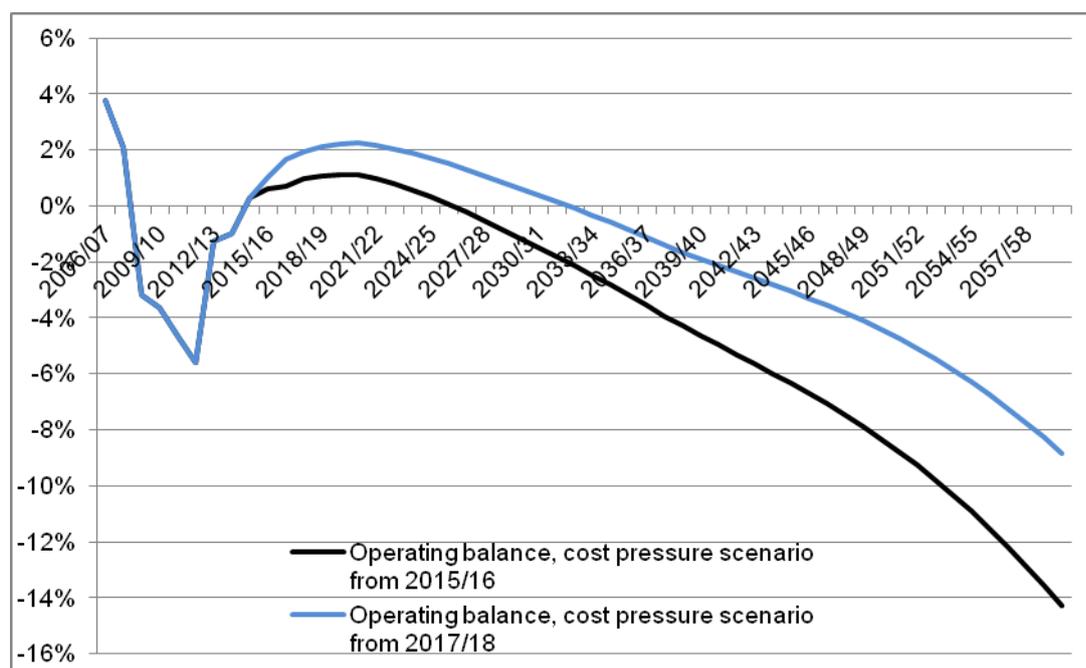
Terminal debt target	Time period	
	2049/50	2059/60
0% net government debt to GDP	2.7%	3.0%
10% net government debt to GDP	2.4%	2.8%
20% net government debt to GDP	2.2%	2.7%
25% net government debt to GDP	2.1%	2.6%
30% net government debt to GDP	2.0%	2.5%
40% net government debt to GDP	1.8%	2.4%

Note: (1) The fiscal gap calculations assume that the permanent change in the primary balance begins in 2017/18.

4.8 Sensitivity analysis

This section looks at the implications for long-term fiscal projections of delays in the implementation of fiscal adjustment. Figure 9 illustrates the implications of the short-term fiscal strategy on the long-term fiscal projections. It compares two scenarios. One scenario is the central scenario, which assumes that government expenditure is constrained by operating allowances until 2014/15 (ie, cost pressures begin from 2015/16). The other scenario assumes that government expenditure is constrained by operating allowances until 2016/17 (ie, cost pressures begin from 2017/18). The projections in Figure 9 illustrate that additional expenditure constraint in the short-term can have significant long-term effects on the government's fiscal position.

Figure 9: Operating balance as a percentage of GDP, under different short-term fiscal strategy scenarios, 2006/07-2059/60



Notes: (1) The operating balance is the Core Crown revenue less expenses plus gains and losses from associates and joint ventures; (2) the projections are based on Budget 2013 forecasts; (3) the central scenario assumes cost pressures begin in 2015/16; the other scenario assumes the cost pressures begin in 2017/18 (ie, there are two years additional fiscal consolidation in the short-term).

The above discussion illustrates that assumptions about the government’s short-term fiscal policy are crucial to long-term projections. In other words, as part of the long-term fiscal strategy, governments need to be concerned with their short and medium-term fiscal strategies, as well as ensure government finances are sustainable given cost pressures arising from population ageing and age-related public expenditure programmes.

Governments are faced with a range of choices about how and when to adjust their fiscal programme. We review those issues and the type of trade-offs governments will need to consider in section 5. Before turning to a discussion of the types of trade-offs, it is instructive to turn to review other estimates of the fiscal adjustment New Zealand may need to make to achieve fiscal sustainability.

4.9 OECD comparisons

The OECD has also calculated fiscal sustainability measures for different OECD countries, including New Zealand, using its own long-term fiscal modelling. The calculations are useful to benchmark the results from the Treasury LTFM and to compare New Zealand’s situation to that of other countries. The measures can also be used to illustrate the influence of the terminal debt target on the extent of fiscal adjustment required, as well as the potential effect of future economic shocks on the extent of required adjustment.

The OECD calculations suggest a larger fiscal consolidation is required for New Zealand than that suggested by the Treasury LTFM. This is because the OECD calculations are based on an earlier base year which picks up the effects of the economic recession and Canterbury Earthquake expenditure, but not the more recent improved short-term economic outlook and the Government’s short-term fiscal consolidation plans. There may also be other

factors that cause the calculations to differ, such as how the OECD models the effects of population ageing on government expenditure. The Treasury LTFM projections begin from a later base year and assume planned fiscal consolidation is implemented for this term of government (taken to be three years after the last General Election).

The OECD calculates the New Zealand fiscal gap that would need to be closed to reach a target of 25% net financial liabilities to GDP ratio by 2050 is 5.1% of GDP. This compares to fiscal gaps for other OECD countries ranging from 7.0% for the United States and 5.6% for the United Kingdom to zero for Denmark, Finland, Korea, Luxembourg, Sweden and Switzerland (Sutherland, et. al., 2012). This suggests that New Zealand is amongst the OECD countries facing the largest increase in the primary balance required to achieve a target of net financial liabilities to GDP of no greater than 25% by 2050.

The OECD also shows the implications of different terminal debt targets for the extent of fiscal adjustment needed. If a fiscal gap is positive (in that either government spending would need to be reduced or taxes increased to reach the debt target), then a lower terminal debt target increases the amount of fiscal adjustment required to reach the debt target, and vice versa. However, the increase may be smaller than one might initially think, because small early policy changes can result in significant savings in debt financing cost over long future time periods. The paper finds that the fiscal gap for New Zealand is 5.1% of GDP for a target of 25% net financial liabilities to GDP by 2050, and 5.7% of GDP for a target of 0% net financial liabilities to GDP by 2050. Once the debt target is reached, maintaining debt at that level is a matter of balancing revenue and expenditure. This is the case regardless of where the target is set, although debt servicing costs will be higher and/or revenues from financial assets lower for a higher net debt target.

The OECD run simulations to demonstrate the effect of shocks to government debt on the degree of fiscal adjustment required. They calculate the additional fiscal tightening (or in some cases loosening) for governments to have a 75% chance of reaching the terminal debt target (of 50% gross debt by 2050) when government debt is hit by shocks (both positive and negative) relative to the baseline case of no shocks. These simulations are based on shocks to debt and are based on each country's own historical distribution of shocks as well as the distribution for the OECD as a whole. The paper finds that under these scenarios the additional fiscal tightening needed to have a 75% chance of meeting the debt target is not substantial. For New Zealand, the required fiscal adjustment in response to both New Zealand-specific and cross-OECD shocks is 6.0% of GDP rather than 5.5% of GDP. The paper notes that because of the highly skewed distribution of shocks, setting a higher probability threshold for meeting the debt target (eg, a 90% chance rather than 75% chance of meeting the debt target) raises the fiscal adjustment requirement further (Sutherland, 2012).

5 Fiscal adjustment strategies

5.1 Criteria for evaluating policy reform options

Current analysis suggests demographic change is structural rather than a short-term “blip”. While there is uncertainty around the long-term projections, they suggest the changing demographic profile will have implications for the economy and society and based on current policy settings will push the government’s finances beyond a point that is fiscally sustainable. Uncertainty around the projections may mean that the long-term fiscal challenges need not be solved in one blow now, but rather, require institutional arrangements that ensure the government’s financial position is systematically evaluated over time and ensure adjustments are made as they are needed.

More favourable economic and demographic assumptions (such as higher labour force productivity, labour force participation and net migration) do not change this outlook substantially under current policy settings, because while higher GDP tends to raise tax revenue, it is also likely to feed through into increased government spending. For example, NZ Superannuation payment rates are designed to increase with average wages. Public health expenditure, in the past at least, has increased more than proportionately with incomes due to increasing opportunities resulting from technology change and increasing public expectations of the level and range of public health services that should be made available through the public health system.²⁴

If governments continue to manage to a net government debt target, they can achieve that target by adjusting the level or mix of taxation, adjusting expenditure programmes or government assets and liabilities. Good quality policy analysis can inform decisions about how to weigh up these alternative policy options as well as the timing and implementation of these policy changes.

The Treasury’s Living Standards Framework suggests the following considerations may be prominent in weighing up alternative adjustment options (Treasury, 2012; Gleisner, 2011):

- (i) Incomes and economic growth (including opportunities or incentives for higher labour participation and productivity; removing obstacles to the efficient use of resources or the ability of people to take up new opportunities);
- (ii) Sustainability for the future (including the impact on physical and human capital stocks, or the sustainability of the fiscal position or the environment);
- (iii) Levels of risks (including the ability of New Zealand to withstand unexpected adverse shocks, and the impact on economic growth, public and private debt, public and external deficits and inflation);
- (iv) Distributional analysis (including distributional impacts across society, both within and between generations, and whether people have opportunities to improve their position); and
- (v) Social infrastructure (including other considerations, such as implications for social institutions, such as trust in society, the rule of law, and democratic institutions).

²⁴ For modelling of the sensitivity of projections to different labour force, productivity and other assumptions, see for example, Rodway (2013).

Policy options for achieving fiscal sustainability may involve a trade-off between some of the above mentioned considerations. In these circumstances, decisions by governments will inevitably involve value judgements and the weight they attach to different considerations may vary. Policy advisors have a role in providing transparent analysis of the impacts on these criteria of the various policy options.

Fiscal policy decisions, in relation to the level and mix of expenditure and taxation have implications for economic growth. Cook et. al. (2011) examines evidence regarding the size of government and economic performance. The paper concludes that the impact of the size of government on economic growth will depend on the type and quality of expenditure and the mix of taxes used to finance it.

Large governments could undermine economic growth due to the economic costs of raising taxation to finance expenditure. There is strong evidence that taxes reduce growth by negatively impacting incentives to work, save and invest. Some taxes will be more damaging for growth than others. On the other hand, some forms of government expenditure may contribute to economic growth, for example by enhancing the benefits from investment in physical capital, knowledge, human capital, research and development or public infrastructure. The Tax Working Group (2010) summarises the range of estimates of the impact of different types of taxes, government deficits and different types of expenditure on economic growth drawing on literature such as Arnold et. al. (2011), Kneller et. al. (1999), Johansson et. al. (2008) and other studies. The Tax Working Group find that corporate and personal taxes tend to be relatively more damaging for growth, whereas consumption and property taxes tend to be relatively less damaging. Infrastructure and education expenditure tend to be more positive for growth than health and social welfare expenditure.

Fiscal sustainability focuses on whether fiscal policies are sustainable into the future and is the primary focus of the Treasury Long-Term Fiscal Statement. As mentioned throughout this paper, fiscal sustainability is affected by pressures for increased government expenditure that come from demographic change affecting health and NZS in particular. Along with the expected level and growth of economic output, governments will also be concerned about reducing risks that face New Zealand. Achieving sustainable public debt helps to reduce those vulnerabilities as would policies that increase overall national savings by increasing savings of households and businesses. Distributional considerations, such as who will “gain” or “lose” from a particular policy, both at a point in time and over time, as well as within and across generations, will be an important consideration when assessing policy options.

Governments may also be concerned about the implications of possible fiscal policy changes for the core social infrastructure of society, such as broader environmental or social impacts.

This approach has now been adopted as part of Treasury’s preparation of its third Long-Term Fiscal Statement (see for instance Karacaoglu, 2012; Prebble 2012). A similar approach of assessing policy options against a transparent set of criteria was taken by the Tax Working Group (2010) where alternative options for reforming the New Zealand tax system were assessed against the principles of a good taxation system, an approach described by Creedy (2010) as an example of rational policy analysis.

5.2 Lessons from previous fiscal adjustments

The experiences of past fiscal adjustment processes illustrate the value of framing an approach to fiscal decision making that endeavours to guide policy decisions. It is evident from past experiences that despite best intentions, fiscal policy plans can deviate from initial objectives for several reasons. Some of the facts and lessons from previous fiscal adjustments illustrate this and can be summarised as follows:

- The motivation for reforms can differ and include a desire to reduce deficits, tackle external current account imbalances, reduce rising interest costs, and more recently, medium-term and long-term concerns about fiscal sustainability associated with an ageing population (Mauro, 2011).
- Government budget plans can encounter significant surprises, especially arising from events that impact on economic growth and in turn taxation revenue and unexpected expenditure, which have sizable impacts on the ability of governments to realise their fiscal plans. As a result government budget plans need to be sufficiently flexible to accommodate shocks, but resilient enough to preserve medium term objectives (Mauro, 2011).
- Public support for reforms, public communication of the budget strategy, and explaining how the government would respond under unforeseen circumstances, can be helpful to ensuring reform plans can be sustained (Mauro, 2011).
- Stronger economic growth can assist with fiscal consolidation but fiscal consolidation will largely come from improvements in a government's primary balance (Sutherland et. al., 2012; Mauro, 2011; Treasury, 2006; 2009).
- Most fiscal adjustment plans include expenditure reductions, and expenditure reductions have tended to be more durable than revenue increases (Sutherland et. al., 2012).
- Most large consolidations have involved both expenditure reductions and tax increases. Expenditure cuts have tended to be not as large as planned, and revenue increases larger than planned. This has often been because of revenue measures being introduced due to problems implementing spending cuts, or temporary factors such as stronger than expected economic growth (Sutherland et. al., 2012; Mauro, 2011).
- Governments tend to protect expenditure that is likely to enhance productivity and economic growth, such as education, transport and communications expenditure, and cut back on social security (welfare) payments as well as spending on defence, housing, and cultural affairs. Health, public services and environmental protection tend to hold their own during fiscal consolidations. This contrasts somewhat with the New Zealand experience where government expenditure on economic activities (including transportation and communications) was reduced relative to other areas from the mid-1980s and public health expenditure has tended to be protected during fiscal adjustments (Sanz, 2011).

5.3 Timing of fiscal adjustment

When undertaking fiscal adjustment the timing and pace of fiscal adjustment is an important consideration. On the one hand delaying fiscal consolidation may increase the amount of adjustment required at a later period. However, in an environment of uncertainty, there may also be benefits of waiting for further information before making decisions. The decision whether to make fiscal adjustments now or whether to wait will depend on the degree of uncertainty associated with population ageing, expected behavioural responses to the consequences of population ageing, including expected impacts on government spending programmes and revenue. It will also depend on the time preference of society; that is, the willingness of society to put up with more “pain” today in return for less “pain” later. Also relevant is how society values the well-being of current versus future generations.

But the economic and social costs of making fiscal adjustments early versus delaying adjustment may not be symmetric. For example, the costs of reducing the track of government spending today in anticipation of growth in the proportion of older people which ultimately proves to be overstated, may not be as serious as delaying fiscal adjustment where the growth in proportion of older people turns out to be understated. This asymmetry could be accentuated if the decision to act early is easily reversible while the decision to delay leads to change being politically difficult and economically disruptive to implement. The situation that some countries are now facing in the aftermath of the GFC perhaps illustrates this type of risk.

Projections using the Treasury Long-Term Fiscal Model show that in order to stabilise net government debt at 20% of GDP, the government needs to run small budget surpluses on average over time. If the government delayed making adjustments then it will accumulate debt, which will require larger fiscal adjustments in the future. Projections using the LTF Model show that:

- (i) If fiscal adjustment starts in 2015/16 (continuing on from the current programme of fiscal consolidation) then governments would need to run budget surpluses of 2.3% of GDP for six years to pay down debt to 20% of GDP by 2020 (the current government goal).
- (ii) Delaying adjustment until 2020/21 would require average surpluses of 2.6% of GDP to be run to reach the debt target within the same adjustment period of six years; and
- (iii) Delaying adjustment until 2030/31 would require average surpluses of 3.5% of GDP to be run to reach the debt target within the same adjustment period of six years.²⁵

To put these figures in context, during the decade from 1997-2006 when there was strong revenue growth, governments ran average budget surpluses of 2% of GDP. Delaying fiscal adjustment, in addition to requiring a greater degree of fiscal adjustment, also places greater risk that the government is not well placed to respond to an adverse shock to the economy and to government finances.

Sutherland et. al. (2012) estimates that for New Zealand a two year delay in fiscal adjustment increases the fiscal gap by more than one-third of a percentage point of GDP. Delaying adjustment in certain areas may make reform more difficult from a political-economy point-of-view. For example, it may be more difficult to reform retirement income policy as the age of the median voter increases. Adjustment sooner allows for more gradual adjustment and

²⁵ For further explanation of this modelling, see Bell (2013). Note that these simulations only show the extent of fiscal surpluses required to achieve the debt target, and do not attempt to capture any possible benefits of delays in adjustment nor costs that might arise from a larger fiscal adjustment when that adjustment is made.

greater tax and expenditure smoothing over time and also helps to build a buffer more quickly to respond to future shocks. Reducing debt servicing costs also provides more flexibility for expenditure increases or tax reductions in the future as governments will be spending less tax revenue on debt servicing costs. However, from a political perspective, implementing fiscal reform may be easier to bring about when the challenge of fiscal sustainability becomes more acute.

The current National-led government has a target of bringing net government debt down to no higher than 20% of GDP by 2020. Therefore the timing of fiscal adjustment may occur in at least two stages: adjustment over the medium-term to reach the 2020 debt target, and then adjustment required to stabilise debt beyond that point in time.

Ongoing expenditure control and/or revenue increases will be necessary for the government to reach the target of 20% net government debt to GDP by 2020. The government's fiscal strategy involves government expenditure as a percentage of GDP being reduced from just under 34% of GDP in 2011 (which includes approximately 0.75% GDP Canterbury earthquake related costs) to 30% of GDP in 2016.

While the second phase of adjustment may seem a long time away, many of the policy changes that governments may consider in the second phase of adjustment, such as changes to NZS, could benefit from reasonable phase-in periods. The Retirement Commission (for example, in its 2010 report) recommend increasing the age of eligibility for NZS from 65 to 67 years, starting in 2020 and increasing the age of eligibility by two months each year. This would mean that the increase in the age of eligibility for NZS to 67 years would not be fully implemented until 2033 (Retirement Commission, 2010). However, when the age of eligibility for NZS was increased most recently in New Zealand from 60 to 65 years, the change was implemented over a shorter time horizon (on average about 6 months a year 1992-2001). Nevertheless, there are generational equity implications of delaying adjustment and then making a quick adjustment subsequently.

6 Summary and conclusions

Designing government fiscal programmes to ensure they are sustainable has important economic benefits. In acknowledgement of these benefits, New Zealand has adopted a legislative framework that requires government to keep its total debt at "prudent levels". Consistent with this, successive New Zealand governments have steadily reduced the level of New Zealand's government debt since the mid-1980s. Nevertheless, New Zealand, like many other countries, is experiencing a changing demographic profile which will have implications for society and the economy, including the government's fiscal position in the future and potentially the sustainability of its spending programmes. This was the message highlighted by the Treasury's first two Long Term Fiscal Statements published in 2006 and in 2009, and it is a fiscal theme that applies to many other developed countries that are experiencing a structural shift in their demographic profile.

Although the success of the past 25 years in reducing the level of government debt suggests that New Zealand governments have a good history of reducing fiscal vulnerability and managing to a prudent debt level, the underlying forces impacting on government expenditure in the future will be different and therefore the economic and political tradeoffs and challenges will be different.

While there is considerable uncertainty over future interest rates and economic growth, it would seem that because of the implications of population ageing (as well as the income and technology effects on demand for health care) governments are likely to be faced with a significant fiscal challenge in the future. Projections using the Treasury LTF Model suggest that under the scenario that the current fiscal programme being implemented during this term of government (which involves government expenditure as a percentage of GDP being reduced by over 1% between 2012 and 2014), net government debt gradually increases from around 25% of GDP in 2012 and by the 2060s reaches levels well beyond what is currently regarded as prudent.

The Treasury's Long-Term Fiscal Statements do not recommend a long-term government debt target, as this will change over time in light of some of the considerations discussed in this paper. However, for modelling purposes scenarios are examined that constrain net government debt to 20% of GDP on average over time and can show the sensitivity of the projections to different debt targets, eg, 0%, 10% and 30% net debt. The projections show that in order to stabilise net debt at 20% of GDP the government would probably need run an operating surplus of 1 to 1.5% of GDP over the long run. Stabilising net debt at 20% of GDP requires the government to manage the "wedge" that arises between the cost pressure and sustainable debt scenarios, for example, by changing tax settings or expenditure. A significant portion of the gap represents the difference in debt financing costs between the two scenarios, and so if governments begin adjusting earlier, they avoid some of those costs eventuating.

Although there is uncertainty around these fiscal projections, it is difficult to avoid the conclusion that there are considerable economic risks associated with policy inertia, particularly if projections underestimate future increases in life-expectancy. There are also economic and political costs associated with delays in making the adjustments required to ensure that public debt remains within a prudent range. Although Long-Term Fiscal Statements have analysed these issues and provided illustrative adjustment scenarios, we suggest a stronger focus needs to be given to assessing the options and trade-offs associated with fiscal adjustments to government expenditure programmes, to taxation revenue-raising options, and to the timing of policy adjustments.

This paper has summarised the issues relevant to assessing the government long-term fiscal situation. This includes having a clear understanding of how population ageing and other factors such as rising incomes will impact on the future fiscal situation, forming a view on prudent levels of public debt and understanding the degree of uncertainty surrounding fiscal projections. Also relevant is how uncertainty and the political and economic costs of adjustment now and at a future date should influence decisions about the timing of fiscal adjustment. Developing a set of transparent criteria for weighing up fiscal reform options (such as Treasury's Living Standards Framework), is important to communicate how policy options impact on policy objectives such as achieving economic efficiency and growth, sustainability, managing risk, and understanding the distribution of benefits and costs of reform options.

It is beyond the scope of this paper to delve into these options and tradeoffs in any detail. But greater attention needs to be placed on these issues to ensure a more informed public debate and more informed policy choices.

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